Recommendation 21 (CBS-Ext.(2014))

UPDATES TO THE *GUIDE TO THE WMO INFORMATION SYSTEM* (WMO-No. 1061)

THE COMMISSION FOR BASIC SYSTEMS,

Noting:

(1)   Resolution 14 (EC-65) – Quality management and infrastructure development of the WMO Information System,

(2)   The *Manual on the WMO Information System* (WMO-No. 1060),

(3)   The *Guide to the WMO Information System* (WMO-No. 1061),

(4)   The *Technical Regulations* (WMO-No. 49), Volume I, Part II, section 5 – Competence of Meteorological, Hydrological and Climatological Personnel,

Recommends the following modifications to the *Guide to the WMO Information System*:

(1)   To add Part VI on Operational Guidance as described in Annex 1 to the present recommendation;

(2)   To add an appendix containing annexes to paragraphs within the Guide, as described in Annex 2 to the present recommendation;

(3)   To add an appendix containing Use Cases supporting the Technical Specifications of the WMO Information System (WIS) provided in the *Manual on the WMO Information System*, as described in Annex 3 to the present recommendation;

(4)   To add an appendix containing Demonstration Test Cases supporting the WIS centre demonstration process for Global Information System Centres, Data Collection or Production Centres and National Centres, as described in Annex 4 to the present recommendation;

Further recommends to add the WIS Competencies, as contained in Annex 5 to the present recommendation, and WIS Training and Learning Guide, as contained in Annex 6 to the present recommendation, to the *Technical Regulations*, Volume I, Part II, section 5;

Encourages Members to use, in the interim, the WIS Competencies and WIS Training and Learning Guide described in Annexes 5 and 6 to the present recommendation;

Requests the Secretary-General to prepare appropriate text for inclusion in the Manual and the Guide linking the WIS Competencies and WIS Training and Learning Guide to the *Technical*

Regulations, Volume I, Part II, section 5 – Competence of Meteorological, Hydrological and Climatological Personnel.

Annex 1 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM OPERATIONAL GUIDANCE – NEW PART VI

1. **Insert the following text to introduce Part VI of the *Guide to the WMO Information System* (WMO-No. 1061) relating to WIS operational practices**

PART VI. OPERATIONAL GUIDANCE

6.1 General

The *Manual on the WMO Information System* defines practices and procedures based on specific standards defined in Part IV of the Manual that are to be used by centres contributing to WIS. Part VI of this Guide to the WMO Information System is being developed and will contain information on the agreed operational practices that are considered to be stable and slow changing. Other guidance on agreed or recommended practices for WIS centres may be found at http://wis.wmo.int/WIS_Operations.

6.2 GISC support to NCs and DCPCs

6.2.1   A GISC is expected to provide the following support activities to the centres (NCs and DCPCs) in its area of responsibility.

Operation coordination

6.2.2   Each GISC should organize regular meetings with the WIS National and WIS Centre Focal Points for those centres belonging to its AMDCN to coordinate the implementation, operation and improvement of the AMDCN to ensure it meets WIS requirements.

6.2.3   Each GISC should maintain business continuity plans and handover arrangements to ensure continued service to the NCs and DCPCs in its area of responsibility, especially for the collection and distribution of data and products.

Technical support

6.2.4   Each GISC should provide technical consultation on implementing and improving WIS functionality, such as search and management of metadata, to the centres in its area of responsibility.

6.2.5   Each GISC should support the centres in its area of responsibility in creating and maintaining WIS discovery metadata, in adopting recommended data formats as well as in monitoring activities.

Capacity-building support

6.2.6   Each GISC should develop and provide training courses with reference to the WIS Competencies and the WIS Training and Learning Guide to meet the capacity-development requirements of the centres in its area of responsibility.

6.3 GISC back-up procedures

6.3.1   Paragraph 3.5.9.2 of WMO No. 1060 Manual on WIS requires GISCs to maintain arrangements with one or more back-up GISCs that include, as a minimum, the collection and dissemination of information to/from its AMDCN to be taken up by another GISC in case of an incapacitating system failure.

Note: Responsibilities of the backup GISC are limited to those centres allocated to it in the backup agreement between the GISC and its backup GISC.

Backup Services

6.3.2   Data collection and distribution must continue without interruption to and from centres in the GISC area being backed up. Where a centre's routine receipt of data is through subscription (e.g. GTS push), the backup GISC must have a current list of data to be sent to each centre or provide a place for the centres to come and get the data (e.g. GISC Cache).

6.3.3   Centres may be unable to change their GTS subscriptions during a period of back up operation, and any changes to subscriptions might not be maintained when normal operations resume.

6.3.4   Changes to metadata will not be possible during a back-up period

6.3.5   Any ad hoc changes made during a back-up period may need to be redone after return to normal operations.

User Information

6.3.6   If there is a need to exchange user information between GISCs in support of backup, proper security measures should be taken based on the agreement on the two GISCs. However, the centres should ensure that the backup GISC has sufficient information for sending and collecting data from centres being supported during a back-up period.

 6.3.7   Ad hoc changes to subscriptions, including additions or deletions of subscribers should be avoided while in backup mode. Any ad hoc changes made during a backup period may need to be redone after return to normal operations.

Networks

6.3.8   GISCs need to ensure network connectivity to centres in the AMDCN of the GISC it is backing up. This may be through dedicated links, such as GTS, or over the Internet. Such connectivity should be in line with the Guide to IT Security (WMO No 1115) and Guide on VPN via the Internet (WMO No 1116) as applicable.

6.4   Procedures for changing principal GISC

6.4.1   The principal GISC for each centre is listed in Appendix B of WMO No. 1060 Manual on WIS. The recommended procedure for NCs and DCPCs changing their principal GISC is provided in the Annex to this Paragraph (See Appendix A).

6.4.2   Once notified that the new principal GISC is ready, the centre shall start using the WIS services of the new principal GISC, in particular the service of uploading and managing the WIS discovery metadata for its data and products.

6.5   Guidelines for migrating WIS discovery metadata records from one GISC to another GISC

6.5.1   A side effect of Section 4.10 of WMO No. 1060 Manual on WIS that defines how GISCs should exchange metadata is that any NC or DCPC can upload its metadata records only to its principal GISC. Not applying this rule will lead unnecessary duplication of WIS discovery metadata.

The annex to this paragraph (see Appendix A) describes the agreed procedures that a centre and affected GISCs should follow in the cases of a centre changing its principal GISC.

6.5.2   The principles defined in the Annex to paragraph 6.5.1 can also apply to a GISC providing temporary back-up metadata management services to a centre's principal GISC.

6.6   Procedure on rolling review of WIS centres

6.6.1   Sections 2.2.4 and 2.3.4 of WMO No. 1060 Manual on WIS define how GISCs and DCPCs are required to demonstrate to CBS their capability to provide WIS services in compliance with the GISC or DCPC functions and responsibilities.

6.6.2   CBS, recognizing that for WIS to remain fully functional, requires regular reviews of each NC, DCPC and GISC ensuring their on-going compliance with the Manual on WIS. Recommended practices for this rolling review process are provided in the Annex to this paragraph (see Appendix-A).

Annex 2 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM OPERATIONAL GUIDANCE – NEW APPENDIX A

1.   Insert the following Appendix A of the *Guide to the WMO Information System* (WMO-No. 1061) containing annexes to paragraphs in the Guide

APPENDIX A. ANNEXES TO PARAGRAPHS IN THE GUIDE TO THE WMO INFORMATION SYSTEM

Note: The following annexes to paragraphs in the Guide to WIS are labelled in the form of Paragraph Number/Annex number.

6.4.1 / Annex 1 – Procedures for changing of principal GISC

1.   The centre (NC/DCPC) wishing to change its principal GISC should consult with its present and proposed principal GISCs and receive the agreement of the new principal GISC.

2.   The centre should liaise with the chosen GISC to check the communication network connectivity to the chosen GISC and ensure that the bandwidth is sufficient to send and receive all data without undue delays.

3.   The centre should send a letter endorsed by its Permanent Representative to the WMO Secretary-General, with a copy to its existing GISC. The letter should state the centre's choice of new principal GISC and include endorsement of the arrangement by the new principal GISC. The letter should also ask the Secretary-General to inform the regional association responsible for the centre (and those of the GISCs concerned where they are not in the same region as the centre).

4.   The WMO secretariat shall inform CBS, with copy to the original and new principal GISC of the change to prepare an update to WMO No. 1060 Manual on WIS Appendix B.

5.   WMO secretariat should update the WIS centres Database (http://wis.wmo.int/wiscentresdb) and the WMO Country Profile Database (http://www.wmo.int/cpdb).

6.   The new principal GISC should coordinate with the associated GISC (s) for the centre to arrange and setup the backup service.

7.   The new Principal GISC should coordinate with the original principal GISC to take over responsibility for discovery metadata records describing the data and products of the centre as recommended in section 6.5 of this Guide to the WIS.

8.   The new principal GISC should notify all operational GISCs of the change to its area of responsibility.

6.5.1 / Annex 1 – Guidelines for migrating metadata records from one GISC to another GISC

1.   Scenario and use case

1.1   Consider the migration of metadata between two GISCs: GISC A and GISC B. GISC B is becoming newly operational and starting metadata management for National Centre X as its principal GISC. Accordingly, GISC A, which has been providing the WIS Interim Metadata Management Service (WIMMS) for National Centre X, is ending the service. Practically, a set of metadata records owned by National Centre X needs to be moved from the OAI set that is provided by GISC A (labelled in what follows as WIS-GISC-A) to that of provided by GISC B (WIS-GISC-B).

2.   Operational guidelines

2.1.   Give notice to other GISCs

GISC A and B jointly give one-week prior notice to other operational GISCs that they will transfer the metadata management from GISC A to B, with the list of location identifiers CCCC, in case of metadata records that are associated with GTS messages. This notification is necessary because other GISCs need to make configuration changes so that each CCCC belongs to specific OAI sets, before they start harvesting new records.

2.2.   Delete and add records at GISC A and B

A) GISC A – delete records from WIS-GISC-A
This should be done using the "deleted records" procedures in OAI-PMH, not the simple deletion of records from the database, so that harvesters of other GISCs can harvest the deletion information through the ordinary incremental harvesting. The specifications for deleted records are described in section 2.5.1 of The Open Archives Initiative Protocol for Metadata Harvesting (http://wis.wmo.int/oaiprotocol).

In the case that GISC A needs to delete these records completely from its database, GISC A must only do so after it makes sure that other GISCs have completed harvesting the deletion.

B) GISC B – add records to WIS-GISC-B set
This should be done with an accurate datestamp, which allows harvesters of other GISCs to gain the added records through the ordinary incremental harvesting.

2.3.   Track harvesting by other GISC

GISC A and B make sure that other GISCs harvest the change correctly, and if not they need to give notice and ask for manual adjustments.

3.   References

•   OAI metadata harvesting protocol: http://wis.wmo.int/oaiprotocol

6.6.2/ Annex 1 – Procedure for rolling review of WIS centres

Note: In the event that the structure of CBS changes, all references to Open Area Programme Group (OPAG), Implementation Coordination Team (ICT), Expert Team (ET) or Task Team (TT) are intended to apply to successors of the named bodies.

1. *Requirement: WIS Centres must comply with WMO No. 1060 Manual on WIS*

a) The Commission for Basic Systems (CBS) is responsible for certification of WIS Centres' compliance with WIS specifications. CBS will maintain, within its OPAG ISS (or its successor) structure, a task team to coordinate WIS centre audits and certifications. For the purpose of this Guide, this task team or its equivalent group of experts is referred to in the following guidelines as the TT-CAC.

    i) GISCs
        (1) TT-CAC, on behalf of CBS, is responsible for audit and certification of GISCs

    ii) DCPCs
        (1) DCPCs are to be certified by the TT-CAC
        (2) Where a DCPC is not using the infrastructure of its principal GISC, and its principal GISC is operational, then it can be certified by TT CAC once the principal GISC has performed the tests; however, if the principal GISC is not operational, TT-CAC will arrange for a suitable GISC to perform the tests;
        (3) If a DCPC uses the infrastructure of its principal GISC then it is certified as a part of the GISC audit certification.

    iii) NCs
        (1) Compliance of NCs is the responsibility of the PR
        (2) Testing of compliance of an NC should be done by its principal GISC.
        (3) TT-CAC will monitor the NC compliance process in consultation with NCs and GISCs

b) WIS technical specifications are recorded in Appendix C of WMO-No. 1060 Manual on WIS.

2. *Audits and certification*

a) Auditors and certifiers shall be or shall become members of TT-CAC. New members:

    i) must have relevant technical or audit experience (the nomination form is at http://wis.wmo.int/file=1117);

    ii) must be a member (core or associate) of an OPAG-ISS expert team or have written commitment of the PR for the participation of the expert as a member of the TT-CAC,

    Note that regional diversity of members of TT-CAC is necessary

b) GISC auditors should continue to be from a different region to the GISC

c) A GISC should be audited by two experts.

    i) One of the two experts must have been involved in previous GISC audit

d) DCPCs require only one TT-CAC coordinator

    i) New members will be mentored

    ii) The coordinator will ask a GISC to undertake tests with the DCPC

    iii) It is expected that the centre's principal GISC will undertake the tests

e) TT-CAC workspace and online databases are restricted to access only by TTCAC (and Secretariat)

3. *GISC audits*

a) In a similar way to an ISO 9001:2008 audit process, the audit will follow the principle of alternating full and intermediate audits aligned with CBS/EC cycle of four years.

b) CBS endorsement is based on continued successful audit outcomes

    i) Validity, intermediate audit (interim four years)

(1) A mid-cycle review of performance and compliance to provide, if necessary, opportunities to introduce corrective actions well in advance of a full audit.

(2) Full audit (every second audit – i.e. every eight years)

(a)   Will result in recommendation for affirmation or cancellation of endorsement

c)   Recurring audit will check that WIS Centres have implemented any new requirements or agreed practices due, and corresponding tests will be identified and undertaken.

i)   These changes to audit procedure will be included in the guidelines on centre audit and demonstration process.

d)   Travel and per diem should be at the GISC's expense and arranged through WMO.

4.   *Public notification of type of CBS endorsement*

a)   Centre endorsements are published only as "CBS endorsed" with no public declaration of whether endorsement was with "qualifications".

b)   Details of centres review audits are confidential

c)   Auditors will have access to the centre's previous reports in order to perform their role.

5.   *Review of audits with qualification.*

a)   GISCs that have received an "endorsed with qualifications" have two years from the day of the audit to demonstrate that they have taken remedial action on the points of qualification.

b)   TT-CAC will investigate GISCs that have received an "endorsed with qualifications" and have not demonstrated that they have taken remedial action on the points of qualification within 2 years from the day of audit. TT-CAC should report to CBS on the progress in addressing the aspects that incurred the "Qualification." TT-CAC can recommend to CBS that it revoke its endorsement.

6.   *Recurring audits.*

a)   GISCs should be audited at least once every four years.

b)   Review cycle should start from date of "CBS endorsement", or for centres endorsed before 1 Jan 2012 (the date WIS became operational) the cycle will be based on 1 Jan 2012.

i)   Audit timings will need to be coordinated with the availability of experts to undertake the audit, but should take place within the calendar year of the anniversary

ii)   The CBS endorsement date should be recorded in the WIS centre database.

iii)   The date the centre became operational should be recorded if known.

7.   *DCPCs reviews*

a)   The DCPC review cycle will be eight years.

b)   Reviews will cover all aspects of WIS compliance.

8.   *NCs reviews*

a)   Review of NCs compliance is the responsibility of the Permanent Representative in liaison with the NC and its Principal GISC.

9.   *Ad hoc audits or reviews*

a)   An ad hoc audit or review can be requested by the president of CBS

i)   For example due to non-conformance causing problems with WIS operations.

10. *Full audits of GISCs*

a)   Shall include site visit using practices in line with those of the ISO 9000 series standards.

11. *Audit process for GISCs*

a)   Scope of audits

    i)   "Full" audits will cover all aspects of WIS compliance

    ii)   "Interim" audits will focus on a particular subset of topics
        (1) Actual elements to be focused on will be determined by ICT-ISS or its delegated expert team in coordination with ICT-ISS members
        (2) Centres will be told in advance of which subset of topics
        (3) Possible focus areas for reviews in interim audits include:
            (a)   GISC to GISC backup
            (b)   Security
            (c)   Monitoring
            (d)   Quality of service provided by the WIS
            (e)   WIS core network (e.g. in 2014 this was the RMDCN NG)
                (i) connectivity and management
                (ii) Cache "Globally distributed data" content
            (f) Management of area of responsibility
                (i) Capacity development
                (ii) AMDCN (connects GISC to NCs and DCPCs in its area)
                    1. Cache "Area of responsibility" content
                (iii) Participation in WIS coordination and planning mechanisms (e.g. CBS IPETs, ETs and TTs)

12. *Audit or review outcome*

a)   Format of report

    i)   TT-CAC will use a template for final reports, although the content will reflect the topics audited.

b)   Will be categorized into Endorsed, Endorsed with Qualification or Not Endorsed

c)   Audit or review recommendation will be provided to the President of CBS and to the Director of WIS

Annex 3 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM – USE CASES

1.   **Insert the following Appendix B of the *Guide to the WMO Information System* (WMO-No. 1061) containing Use Cases for WIS Technical Specifications**

APPENDIX B. WIS Technical Specifications – Use cases.

General

1.   This appendix provides the Use Cases for major WIS Functions relating to the WIS Technical Specifications as described in Part IV of WMO-No. 1060 Manual on the WMO Information System. Use cases are designed to help system developers understand how the system is supposed to operate given certain pre conditions, and reactions to decisions during processing.

2.   The content of most of the Use Cases given in this Appendix follows closely the work of the SIMDAT project led by the European Centre for Medium-Range Weather Forecasting (ECMWF). The form of the Use Cases follows the general guidance of Unified Modelling Language [UML]. It also uses a specific template derived from an example published by Karl E. Wiegers (with permission granted to use, modify, and distribute the template).

3.   The following table provides a key to the elements of the Use Case template as used herein.

Use Case Goal – Brief description of the reason for and outcome of this Use Case, or a high-level description of the sequence of actions and the outcome of executing the Use Case.
Actors – An actor is a person or other entity, external to the system being specified, who interacts with the system (includes the actor that will be initiating this Use Case and any other actors who will participate in completing the Use Case). Different actors often correspond to different user classes, or roles, identified from the customer community that will use the product.
Trigger – Event that initiates the Use Case (an external business event, a system event, or the first step in the normal flow.
Pre-conditions – Activities that must take place, or any conditions that must be true, before the Use Case can be started.
Post-conditions – The state of the system at the conclusion of the Use Case execution.
Normal Flow – Detailed description of the user actions and system responses that will take place during execution of the Use Case under normal, expected conditions. This dialog sequence will ultimately lead to accomplishing the goal stated in the Use Case name and description.
Alternative Flows – Other, legitimate usage scenarios that can take place within this Use Case.
Exceptions – Anticipated error conditions that could occur during execution of the Use Case, and how the system is to respond to those conditions, or the Use Case execution fails for some reason.
Includes – Other Use Cases that are included ("called") by this Use Case (common functionality appearing in multiple Use Cases can be described in a separate Use Case included by the ones that need that common functionality).
Notes and Issues – Additional comments about this Use Case and any remaining open issues that must be resolved. (It is useful to Identify who will resolve each such issue and by what date.)

Table B1. Key to Elements in the Use Case Template

Note: The DAR Metadata Catalogue holds WIS Discovery Metadata records.

Use Case B.1, Provide Metadata for Data or Product

Use Case Goal	Metadata for any data or product file to be available from the DCPC or GISC is created or updated in the DAR Metadata Catalogue of the DCPC or GISC
Actors	Metadata Originator (NC or DCPC) Metadata Catalogue Publisher (DCPC or GISC)
Pre-Conditions	(1) The Metadata Originator is authorized to update the DAR Metadata Catalogue for the associated file(s) (2) The Metadata Originator has the necessary information and the ability to update the DAR Metadata Catalogue for the associated file(s) (3) The Metadata Catalogue Publisher supports facilities for authorized Metadata Originators to update the metadata for the associated file(s)
Post-Conditions	The DAR Metadata Catalogue has changes made by the Metadata Originator
Normal Flow	The authorized Metadata Originator uses a facility supported by the Metadata Catalogue Publisher to update the DAR Metadata Catalogue for the associated file. Typically, two kinds of

	maintenance facilities are supported. One is a file upload facility for "batch" updating (add, replace, or delete metadata records treated as separate files). The other is an online form for changing metadata records treated as entries in the DAR Metadata Catalogue (add, change, or delete of elements in a record as well as whole records). The Metadata Catalogue Publisher maintains the updated DAR Metadata Catalogue as a searchable resource offered to all authorized searchers (see Use Case B.6). The Metadata Catalogue Publisher also shares the metadata as a part of the logically centralized but physically distributed catalogue across WIS centres.
Notes and Issues	This set of actions is a simple extrapolation from existing GTS practice, adding the particular standard format for WIS metadata.
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Use Case B.2, Upload Data or Product to DCPC or GISC

Use Case Goal	Data or product is sent as a file to a DCPC or GISC
Actors	Data Sender (NC or DCPC) Data Receiver (DCPC or GISC)
Pre-Conditions	(1) Appropriate metadata to be associated with the file is already available in the DAR Metadata Catalogue of the DCPC or GISC (if not, see Use Case B.3) (2) The Data Sender is authorized to send the file to the Data Receiver (3) The Data Receiver supports a method for uploading the file, which the Data Sender is able to use
Post-Conditions	The data or product uploaded by the Data Sender is received and stored by the Data Receiver.
Normal Flow	The Data Sender uses his authorized access to send the file using an appropriate transmission method supported by the Data Receiver. Typically, the transmission is accomplished using GTS or a file transfer method available over the Internet. A file naming convention or other agreed mechanism is used to make an association between the file and its metadata
Notes and Issues	This set of actions builds on existing GTS practice, supplemented with other file transfer mechanisms such as the Internet.
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Use Case B.3, Control Metadata Association to Data or Product

Use Case Goal	Confirm that metadata for a data or product file at the DCPC or GISC already exists in the DAR Metadata Catalogue before the data or product is available
Actors	Data Sender (NC or DCPC) Data Receiver (DCPC or GISC)
Pre-Conditions	(1) Data or product has been sent as a file from a Data Sender (Use Case B.1) (2) DAR Metadata Catalogue is current with all updates (Use Case B.2)
Post-Conditions	An error is communicated when there is not confirmation that a given file is associated appropriately with metadata in the DAR Metadata Catalogue
Normal Flow	On receipt of a file containing a data or product, the Data Receiver checks the current DAR Metadata Catalogue to confirm that the file has an associated metadata record. If such a record is not found within two minutes after receipt of the file, an error message is sent to the Data Sender.
Notes and Issues	This control action addresses the condition wherein data arrives before its associated metadata. Rather than rejecting the file immediately, a grace period of two minutes is allowed before the data file is regarded as erroneous.
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Use Case B.4, Manage Cache of Data across GISCs

Use Case Goal	GISCs manage a logically centralized collection containing at least a 24 hour cache of data and

	products agreed by WMO for routine global exchange
Actors	Data Administrators at each of the GISCs
Pre-Conditions	(1) At each GISC, the cache of data and products received from NCs and DCPCs in its area of responsibility is current (2) Transmission and control mechanisms across GISCs are available (3) All Data Administrators are authenticated and authorized as needed
Post-Conditions	The cache of data and products is accessible as a logically centralized collection that includes current data and products at each GISC
Normal Flow	A Data Administrator monitors the transmission methods and control mechanisms that enable a logically centralised view of the physically distributed cache of data and products. Depending on the methods in place, a Data Administrator takes various corrective actions whenever the cache is not available as required.
Notes and Issues	At this point in WIS system design, it has not been decided how the GISCs will accomplish centralization of the cache.
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Use Case B.5, Maintain Identification and Role Information for WIS Users

Use Case Goal	Internal and external users of WIS are able to be identified as needed for their authentication, and their role information is maintained as needed for their authorizations to perform specific functions
Actors	Users of WIS (internal and external) Administrators of authentication and authorization at WIS Centres
Pre-Conditions	(1) Administrators have agreed authentication policies delineating the credentials required to establish identity of a WIS user (2) Administrators have agreed authorization policies delineating which roles are authorized to perform each WIS action (3) Administrators have mechanisms to create and maintain identification information needed for authentication of users of WIS (4) Administrators have mechanisms to create and maintain role information needed for authorization of authenticated users of WIS
Post-Conditions	WIS Centres collectively have the ability to authenticate each user of WIS and authorize him to perform all of the functions appropriate to his role, and only those functions appropriate to his role
Normal Flow	Identification and role information about candidate or current users of WIS are to be recorded through facilities controlled by WIS Centres. Typically, two kinds of facilities should be supported. One is a file upload facility for "batch" updating (add, replace, or delete the identification and role records as separate files). The other is an online form for changing identification and role records (add, change, or delete elements in a record as well as whole records). Administrators of authentication and authorization at WIS Centres share the updated identification and role information as a resource available as needed across WIS Centres.
Notes and Issues	At this point in WIS system design, mechanisms have not been decided for handling identification and role information as needed across WIS centres.
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Last Updated By	WMO Secretariat

Use Case B.6, Discover Data or Products

Use Case Goal	A user of WIS finds available WMO data or products that he wants to receive.
Actors	Data Searcher
Pre-Conditions	(1) The DAR Metadata Catalogue is accessible for browsing or searching (2) The GISC infrastructure provides a unified catalogue view to the user (i.e., the catalogue is logically centralized although physically distributed)
Post-Conditions	The Data Searcher has information needed to select relevant data or products.

Normal Flow	The Data Searcher discovers available WMO data and products by browsing the DAR Metadata Catalogue or by searching the DAR Metadata Catalogue using discovery concepts such as subject keywords, geographic extent, and temporal range. As a result of his browsing or searching, the Data Searcher gets a relevance-ordered list of data and products including "data or product metadata" such as data origin, data type, generation date, availability, and use constraints, among other characteristics.
Notes and Issues	At this point in WIS system design, multiple methods can be envisioned for logically centralizing the physically distributed DAR Metadata Catalogue.
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Use Case B.7, Ad Hoc Request for Data or Product ("Pull")

Use Case Goal	A user of WIS requests WMO data or product on an ad hoc basis
Actors	User of WIS WIS Centre
Pre-Conditions	(1) The desired data or product has been identified by the user of WIS (2) The user of WIS has been authenticated and authorized to retrieve the desired data or product from the WIS centre (3) Delivery is achievable through one of the supported mechanisms for the transmission of the desired data or product, and within the published service level commitment of the WIS centre
Post-Conditions	Data or product is readied for delivery to the user of WIS according to the service level commitment of the WIS centre
Normal Flow	Once the user has identified the desired data or product, he requests delivery on a one-time basis. (Use Case B.8 covers the alternate choice, recurring delivery.) The WIS Centre authenticates the user and checks authorization for delivery of the product according to the user's role. The WIS centre then sets up delivery through any of a broad range of online and offline options (delivery options are described in Use Case B.9).
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Use Case B.8, Subscribe to Data or Product ("Push")

Use Case Goal	A user of WIS can subscribe to receive data or products on a recurring basis
Actors	User of WIS WIS Centre
Pre-Conditions	(1) The desired data or product has been identified by the user of WIS (2) The user of WIS has been authenticated and authorized to retrieve the desired data or product from the WIS centre (3) Delivery is achievable through one of the supported mechanisms for the transmission of the desired data or product, and within the published service level commitment of the WIS centre
Post-Conditions	Data or product is readied for delivery to the user of WIS according to the service level commitment of the WIS centre
Normal Flow	Once the user has identified the desired data or product, he requests to subscribe to receive the data or products on a recurring basis. (Use Case B.7 covers the alternate choice, one-time delivery.) The WIS Centre authenticates the user, checks authorization for delivery of the product according to the user's role. The WIS centre then sets up delivery through any of a broad range of online and offline options (described in Use Case B.9). As necessary, the WIS Centre updates the Dissemination Metadata associated with the subscription (Use Case B.10).
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Use Case B.9, Download Data or Product from WIS Centre

Use Case Goal	A user of WIS receives from a WIS Centre, on an ad hoc or subscription basis, data or products transmitted as files

Actors	User of WIS WIS Centre
Pre-Conditions	(1) Data or product is ready for delivery to the authenticated and authorized user, as requested through one of the supported transmission mechanisms and according to the service level commitment of the WIS centre (2) For subscription delivery, the WIS Centre has access to subscription information in the Dissemination Metadata Catalogue (see Use Case B.10)
Post-Conditions	Selected data or products are received by the user of WIS
Normal Flow	The WIS Centre sends files containing the requested data or products, using an appropriate transmission method as indicated in the associated subscription information accessible through the Dissemination Metadata Catalogue. Typically, the transmission is accomplished using GTS or a file transfer method available over the Internet, such as HTTP, OpenDap, FTP, SFTP, GFTP, email, etc). In any case, transmission must be efficient and reliable (checksum and error recovery mechanisms are required at minimum).
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Use Case B.10, Provide Dissemination Metadata

Use Case Goal	Metadata concerning delivery specifics of subscription(s) to data and products from a DCPC or GISC are created or updated in the Dissemination Metadata Catalogue
Actors	Subscription Registrar (NC or DCPC) Dissemination Catalogue Publisher (DCPC or GISC)
Pre-Conditions	(1) The Subscription Registrar is authorized to update the Dissemination Metadata Catalogue for the given subscription(s) (2) The Subscription Registrar has the necessary information and the ability to update the Dissemination Metadata Catalogue for the given subscription(s) (3) The Dissemination Catalogue Publisher supports facilities for authorized Subscription Registrars to update the metadata for the given subscription(s)
Post-Conditions	The Dissemination Metadata Catalogue has changes made by the Subscription Registrar
Normal Flow	The authorized Subscription Registrar uses a facility supported by the Dissemination Metadata Catalogue Publisher to update the Dissemination Metadata Catalogue for the given subscription(s). Typically, two kinds of maintenance facilities are supported. One is a file upload facility for "batch" updating (add, replace, or delete metadata records treated as separate files). The other is an online form for changing metadata records treated as entries in the Dissemination Metadata Catalogue (add, change, or delete of elements in a record as well as whole records). The Dissemination Metadata Catalogue Publisher maintains the updated Dissemination Metadata Catalogue as a reference resource accessible as part of a logically centralized but physically distributed catalogue across WIS centres.
Notes and Issues	At this point in WIS system design, it is has yet to be defined how each Dissemination Metadata Catalogue Publisher will communicate changes to each physically distributed part of the logically centralized Dissemination Metadata Catalogue.
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Use Case B.11, Report Quality of Service across WIS Centres

Use Case Goal	Managers of WIS Centres receive performance reports of operations against agreed quality of service indicators
Actors	WIS Centre Managers
Pre-Conditions	(1) Measurable quality of service indicators are agreed (2) Schedule of reporting and specifics of reporting formats are agreed
Post-Conditions	WIS Centre managers have performance information needed to manage WIS operations across the range of GISC, DCPC and NC services
Normal Flow	On a schedule as mutually agreed, all WIS Centre managers send performance reports of operations against agreed quality of service indicators.
Notes and Issues	It can be anticipated that WIS will eventually have agreements that address quality of service

	requirements. These should include data and network security as well as performance and reliability. CBS is investigating monitoring processes, including reviewing established processes for the World Weather Watch. The current status can be monitored under http://wis.wmo.int/folder=63
Last Updated	30 Jun 2014
Last Updated By	WMO Secretariat

Annex 4 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM – DEMONSTRATION TEST CASES

1.   Insert the following Appendix C of WMO-No. 1061 – *Guide to the WMO Information System* **containing WIS Demonstration Test Cases**

APPENDIX C. WIS Demonstration Test Cases.

General

1.   This appendix provides the test cases for major WIS Functions relating to the WIS technical specifications (TechSpecs) as describe in Part IV of the Manual on the WMO Information System. WIS demonstration test cases differ from Use Cases in that they test a process behaves correctly by looking at the particular input and test to see if the result is as expected.

2.   The guidelines for DCPCs and GISCs on how to demonstrate their compliance to CBS are online at http://www-db.wmo.int/WIS/centres/guidance.doc.

3.   Guidance for NCs on how to work with their Principal GISC to demonstrate their compliance is included in Regional WIS Implementation Plans available at: http://wis.wmo.int/folder=75.

4.   In order to be WIS compliant, all centres should be able to complete those demonstration test cases that are applicable to the services a centre is running. Demonstration test cases are based on the WIS Technical Specifications and Use Cases defined in WMO-No. 1060 – *Manual on the WMO Information System* and in Appendix B of this Guide to WIS respectively.

5.   There are six Test Cases for GISCs, labelled WIS-TC1 to WIS-TC6. All, except for WIS-TC4 are also relevant to DCPCs where they are applicable. The six Test Cases are list under Part 1 of this Appendix.

6.   There are three test cases for NCs, labelled as NC-TC1, NC-TC2 and NC-TC3.

Part 1 – WIS Demonstration Test Cases for GISCs and DCPCs

Test Case Name: WIS Demonstration Test Case 1		
Uploading of Metadata for Data and Products into DAR catalogue		
Test Case ID	WIS-TC1	
Component	Metadata Management	
Purpose of test		
Validate the function of adding, updating and deleting metadata records from other WIS centres.		
All metadata records must be checked against the relevant schemas. (e.g. The record should be rejected if not fitting the schema)		
Note 1: The term "upload" refers to the movement of metadata records between the WIS centre that provides the metadata and the WIS centre that manages the DAR catalogue. It can actually be implemented as a "pull" initiated from the DAR catalogue site, or as a "push" initiated by the metadata provider.		
Note 2: this functionalities can be implemented as: • A web interface allowing registered users to manage their metadata interactively • A machine-to-machine interface allowing automated batch processing of metadata.		
It is necessary that GISCs implement both methods.		
Relevant technical specifications		
• Tech specs 1 (Uploading of metadata) • Tech specs 8 (DAR Catalogue Search and Retrieval)		
Precondition		
1. Have network connection (dedicated and/or public connection) with other WIS centre(s) 2. Have a file upload facility for collecting metadata from other WIS centre(s) 3. Have a fully functional DAR catalogue 4. Have a registered user/process that is authorized to manage metadata of a given WIS centre 5. Have a web interface to the DAR catalogue that allow searches (see TC6)		
Test Steps		
	Description	Expected Results	Actual Results
---	---	---	---
1	A user/process adds a valid metadata record to the DAR catalogue	The metadata record must be found when browsing/searching the DAR catalogue	
2	A user/process modifies a record from the DAR catalogue,	The modification should be immediately visible when browsing/searching the DAR catalogue	
3	A user/process deletes a record from the DAR catalogue,	The deleted record should not be found when browsing/searching the DAR catalogue	
…	A authorized user/process attempts to upload an invalid metadata record	The user/process must be notified of the fact that the metadata record is invalid. The addition/update operation is aborted. The DAR catalogue is unchanged.	

…	A authorized user/process attempts to upload a record with a unique identifier that is already in the DAR catalogue	The DAR catalogue should not contain record with duplicate identifiers. Either: 1. The new metadata record replaces the old metadata record. The old metadata record should not be present in the catalogue. The new metadata record must be found when browsing/searching the catalogue 2. The user/process must be notified of the fact that the record is a duplicate. The addition/update operation is aborted. The DAR catalogue is unchanged. Note: it is essential to ensure an update is an edit and not an accidental duplication
…	Access control - No unauthorized addition 1	A non-authorized user/process should not be able to add a metadata record to the DAR catalogue
…	Access control - No unauthorized addition 2	A user/process should not be able to add a metadata record to the DAR catalogue representing data from another WIS centre
…	Access control - No unauthorized modification 1	A non-authorized user/process should not be able to modify a metadata record from the DAR catalogue
…	Access control - No unauthorized modification 2	A user/process should not be able to modify a metadata record from the DAR catalogue that belongs to another WIS centre
…	Access control - No unauthorized deletion 1	A non-authorized user/process should not be able to delete a metadata record to the DAR catalogue
…	Access control - No unauthorized deletion 2	A user/process should not be able to delete a metadata record from the DAR catalogue that belongs to another WIS centre

Centre	Organization	Country
Test Date		

Test Case Name: WIS Demonstration Test Case 2		
Synchronizing DAR catalogues between GISC nodes		
Test Case ID	WIS-TC2	
Component	Metadata management	
Purpose of test		
GISC should have a global view of metadata. Validate the synchronization of the DAR metadata catalogue between GISCs node via a synchronization protocol		
GISC to GISC synchronization (between separate centres) – Timeliness of synchronization, accuracy		
Test should complement the "add, change and delete mechanisms for metadata demonstrated in test 1.		
Requirements Covered		
• Tech specs 1 (Uploading of metadata) • Tech specs 8 (DAR Catalogue Search and Retrieval) • Tech specs 9 (Consolidated View of Distributed DAR Metadata Catalogues)		
Precondition		
1. Have network connection (dedicated and/or public connection) with other GISC(s). 2. Have DAR catalogue already populated at each GISC participating to the test 3. Have a synchronization facility for synchronizing metadata with other GISC(s)		
Test Steps		

	Description	Expected Results	Actual Results
1	Synchronize the DAR metadata catalogue	Identical content of the DAR metadata catalogue of the GISC(s) participating to the test: • Number of records should be identical • The list of unique identifier should identical • A random selection of records should be identical	
2	Add new metadata record at GISC 1	The uploaded metadata record is added into the DAR Metadata Catalogue of the other GISC(s) participating to the test.	
3	update metadata record at GISC 1	The updated metadata record is added into the DAR Metadata Catalogue of the other GISC(s) participating to the test.	
4	Delete metadata file record belonging to GISC1 at GISC 1	The concerned metadata recorder is deleted in the DAR Metadata Catalogue of the other GISC(s) participating to the test.	
5	Delete metadata file record that doesn't belong to GISC1 at GISC 1	The concerned metadata recorder is uploaded in the DAR Metadata Catalogue of GISC1 from DAR Metadata Catalogue of the other GISC(s) participating to the test.	
...	Re-play 2-5 from GISC2 ...		

Centre		Organization		Country
Test Date				

Test Case Name: WIS Demonstration Test Case 3

Uploading and downloading of data between WIS centres

Test Case ID	WIS-TC3
Component	

Purpose of test

Validate the upload and download of data and products and association with metadata

Requirements Covered

- Tech specs 2 (Uploading of data and products)
- Tech specs 10 (Downloading file via dedicated network)
- Tech specs 11 (Downloading file via non-dedicated network)
- Tech specs 12 (Downloading file via other methods)

Precondition

1. Have network connection (dedicated and/or public connection) with other WIS centre
2. Have file upload and download facilities (FTP, mail, HTTP, …)
3. Have data available for upload or download
4. Have DAR facilities available at GISC.

Test Steps

	Description	Expected Results	Actual Results
1	a. upload a file which is associated with a metadata record in the DAR catalogue of the GISC to a GISC centre b. use DAR facilities to search the metadata then retrieve the file	a. The uploaded file has been delivered to the GISC and match with the corresponding metadata b. The file can be downloaded	
2	GISC Only a. Upload a file which is not associated with a metadata record in the DAR catalogue of the GISC to a GISC centre b. later upload the metadata record associated to the file to a GISC centre. c. use DAR facilities to search the metadata en retrieve the file	a. The uploaded file has been delivered to the GISC b. the DAR catalogue is updated with new record. Previously received file is associated with the metadata c. The file can be downloaded	
3			
4			
…			

Centre		Organization		Country
Test Date				

Test Case Name: WIS Demonstration Test Case 4

Centralization of Globally Distributed Data (Applies only to GISCs)

Test Case ID	WIS-TC4
Component	24 hours cache at GISC

Purpose of test

Validate the completeness of the 24h cache

- Finding a current data or product originating from another centre via the GISC DAR search mechanism, and retrieve that item from the GISC cache.

An attached document describing the process how the GISC will ensure it holds a complete cache for 24 hours, including performance metrics

Requirements Covered

- Tech specs 3 (Centralization of Globally Distributed Data)
- Tech specs 8 (DAR ….)

Precondition

1. Have network connection (dedicated and/or public connection)
2. Have DAR catalogue already populated with metadata of the 24h data for global exchange
3. Have DAR facilities available through a portal
4. Have a cache with at least the last 24 h data for global exchange

Test Steps

	Description	Expected Results	Actual Results
1	Search in catalogue for data/products from other centre and other program in other area and retrieve selected data or products	The selected data/products can be retrieved from GISC	
2	Search in catalogue for data/products 6h old and retrieve selected data or products	The selected data/products can be retrieved from GISC	
3	Search in catalogue for data/products12h old and retrieve selected data or products	The selected data/products can be retrieved from GISC	
4	Search in catalogue for data/products 18h old and retrieve selected data or products	The selected data/products can be retrieved from GISC	
5	Search in catalogue for data/products 24h old and retrieve selected data or products	The selected data/products can be retrieved from GISC	

Centre		Organization		Country
Test Date				

Test Case Name: WIS Demonstration Test Case 5

Maintenance of users, roles, authorization and authentication

Test Case ID	WIS-TC5

Component	Management of users and access

Purpose of test

Create and exercise a variety of user types

Relevant Technical Specifications

- Tech specs 4 (Maintenance of User Identification and Role Information)
- Tech specs 6 (Authentication of a User)
- Tech specs 7 (Authorization of a User Role)
- Tech specs 13 (Maintenance of Dissemination Metadata)

Precondition

1. The Centre has authority to provide access to user (i.e. PR approval from users country)
2. The user interface is via the internet (i.e. web page)

Test Steps

	Description	Expected Results	Actual Results
1	Provide access for an external user to search metadata	Temporary user can search metadata, but not access data from the GISC or cache, or subscribe to data.	
	a) User goes to search web page b) User makes metadata search c) Tries to access data	a) User has access to search page b) User finds metadata c) User tries to access data and is referred to authorization page at data source. Cannot access data without validating in an authorized user role	
2	Create accounts with access to WIS metadata and data for a WMO centre authorized user	Two users are created. One with access to metadata only, the other with the ability to access the Centre subscription service or ad hoc request from the cache	
	a) User goes to registered user web page b) User is required to login or create account c) User registers account and selects role of valid WMO member with authority to access WIS data (eg is from WMO NC) d) User enters login details e) User makes metadata search f) Tries to access WMO globally available data from the centre	a) User has access to login page b) New user, so has to create an account c) User account is validated as a WMO NC member and account is created. The user receives a user login (eg code via email or encrypted symbol) d) User is logged in. As user us validated as WMO NC member, he is allocated access to search and access to download data from cache and to subscription services e) User finds metadata	

	g) User tries to access additional data at centre that he is not authorized to access h) Tries to access data or product at another site i) User subscribes to data for future delivery from centre j) User returns on another session and reuses login to search or subscribe k) User edits subscription details l) User cancels a subscription m) User logs out or leaves centre's site and tries to return to a bookmarked page at a later date and access data	f) User successfully accesses data from centre g) User receives advice that he is not authorized to access this data and referred to access page where he can request change in user role or re-login as another user h) User is referred to authorization page at other site. i) User receives scheduled data via agreed method at agreed time j) User maintains successful access with same access rights k) Users subscription details are updated and reflected in subsequent deliveries l) Users subscription details are updated and receives no further deliveries m) Attempting to use a bookmarked page from earlier session to access data, directs the user to the registered user login page.
4	User checks status of account and subscriptions	User can view his account and subscription details, including historic and future transactions, and the status of current transactions
...		

Centre	Organization	Country
Test Date		

Test Case Name: WIS Demonstration Test Case 6
DAR Catalogue Search and Retrieval

Test Case ID	WIS-TC6
Component	DAR Catalogue

Purpose of test

The purpose of the test case is to assess the functionality of the DAR catalogue.

Relevant technical specifications

Tech specs 8 (DAR Catalogue Search and Retrieval)

Precondition

1. The DAR catalogue is loaded with representative number of WMO Core metadata records that represent a variety of data and products, in particular, the records should represent several time ranges (climate and real-time), several geographical extents (from point to global coverage) and records from several discipline (meteorology, hydrology,…), when applicable for the function of the candidate centre (e.g. GISC, DCPC, …)
2. A web based user interface is made available on the open Internet to provide access to the DAR catalogue
3. There exists a registered user that is allow to retrieve some data and/or product
4. The number of records returned may be subject to size limits of system e.g. 1000 record limit

Test Steps

	Description	Expected Results	Actual Results
1	Browsing	Any record in the DAR must be reachable by browsing the catalogue	
2	Free text search - The user input one or more words in a web form and submit the request	All records that contain the required words. If the user is allowed to select a Boolean operation between the results (i.e. and/or, …), the result should fulfil this operation.	
3	Geographic search - The user input a rectangular geographical area (using a form of a map).	All records that are contained in the area or that overlap with the area, depending on the implementation (the user should be aware of the matching algorithm used). The system should handle the poles and the date line properly.	
…	Time search - The user input either a time interval or a point in time in a web form	All records that represent a time interval or point in time that are contained in or overlap with the requested interval or point in time, depending on the implementation (the user should be aware of the matching algorithm used).	
…	Combination of the above - A user can select a combination of any two or all of the above simultaneously.	All records that matches all the selected criteria.	
	Invalid search made	User receives a meaningful message informing of error	
	ISO23950 Search by URL (SRU)	The above tests will test successfully via SRU interface.	
…	Visualization of a metadata	The user should be able to select a metadata record when browsing or from a search result list. The record must be render in a human readable form.	
	Selection and retrieval of data	The user should be able to select data and/product products either when browsing or from a search result list or when visualizing a meta record. The user is presented with a mean to select instances that are associated with the chosen record. The system must provide a retrieval/referral mechanism that will allow the user to receive the data noting the data may be available from another site.	
…			

Centre		Organization		Country
Test Date				

Part 2 – WIS Demonstration Test Cases for NCs

Test Case Name: NC Demonstration Test Case 1	
Uploading of Discovery Metadata for Data and Products into DAR catalogue	
Test Case ID	NC-TC1
Component	Metadata Management

Purpose of test

Validate the function of adding, updating and deleting metadata records from NC to the Principal GISC.

All metadata records must be checked against the relevant schemas. (e.g. The record should be rejected if not fitting the schema)

Note 1: The term "upload" refers to the movement of metadata records between the National Centre that provides the metadata and the WIS centre that manages the DAR catalogue hosted by the Principal GISC. It can actually be implemented as a "pull" initiated from the DAR catalogue site, or as a "push" initiated by the metadata provider.

Note 2: this functionalities can be implemented as:
- A web interface allowing registered users to manage their metadata interactively
- A machine-to-machine interface allowing automated batch processing of metadata.

All GISCs support both methods. The NC may choose one or both methods

Relevant technical specifications

- Tech specs 1 (Uploading of metadata)
- Tech specs 8 (DAR Catalogue Search and Retrieval)

Precondition

1. Network connection (dedicated and/or public connection) exists between the NC and GISC
2. GISC has a file upload facility for collecting metadata from other WIS centre(s)
3. GISC has a fully functional DAR catalogue
4. GISC has a registered user/process that is authorized to manage metadata of a given WIS centre
5. GISC has a web interface to the DAR catalogue that allow searches (see WIS-TC6[1])

Test Steps

	Description	Expected Results	Actual Results
1	A user/process adds a valid metadata record to the DAR catalogue	The metadata record must be found when browsing/searching the DAR catalogue	
2	A user/process modifies a record from the DAR catalogue,	The modification should be immediately visible when browsing/searching the DAR catalogue	
3	A user/process deletes a record from the DAR catalogue,	The deleted record should not be found when browsing/searching the DAR catalogue	

1 WIS Demonstration Process – http://www-db.wmo.int/WIS/centres/guidance.doc

…	A authorized user/process attempts to upload an invalid metadata record	The user/process must be notified of the fact that the metadata record is invalid. The addition/update operation is aborted. The DAR catalogue is unchanged.
…	A authorized user/process attempts to upload a record with a unique identifier that is already in the DAR catalogue	The DAR catalogue should not contain record with duplicate identifiers. Either: 1. The new metadata record replaces the old metadata record. The old metadata record should not be present in the catalogue. The new metadata record must be found when browsing/searching the catalogue 2. The user/process must be notified of the fact that the record is a duplicate. The addition/update operation is aborted. The DAR catalogue is unchanged. Note: it is essential to ensure an update is an edit and not an accidental duplication
…	Access control No unauthorized addition 1	A non-authorized user/process should not be able to add a metadata record to the DAR catalogue
…	Access control – No unauthorized addition 2	A user/process should not be able to add a metadata record to the DAR catalogue representing data from another WIS centre
…	Access control No unauthorized modification 1	A non-authorized user/process should not be able to modify a metadata record from the DAR catalogue
…	Access control No unauthorized modification 2	A user/process should not be able to modify a metadata record from the DAR catalogue that belongs to another WIS centre
…	Access control No unauthorized deletion 1	A non-authorized user/process should not be able to delete a metadata record to the DAR catalogue
…	Access control No unauthorized deletion 2	A user/process should not be able to delete a metadata record from the DAR catalogue that belongs to another WIS centre

Centre		Organization		Country
Test Date				

Test Case Name: NC Demonstration Test Case 2			
Uploading and downloading of data between WIS centres			
Test Case ID	NC-TC2		
Component			
Purpose of test			
Validate the upload and download of data and products and association with metadata			
Requirements Covered			
• Tech specs 2 (Uploading of data and products) • Tech specs 10 (Downloading file via dedicated network) • Tech specs 11 (Downloading file via non-dedicated network) • Tech specs 12 (Downloading file via other methods)			
Precondition			
1. Network connection (dedicated and/or public connection) between the NC and GISC (includes via RTH where relevant 2. Have file upload and download facilities (FTP, mail, HTTP, …) 3. Have data available for upload or download 4. Have DAR facilities available at GISC.			
Test Steps			
	Description	Expected Results	Actual Results
1	a. upload a file which is associated with a metadata record in the DAR catalogue of the GISC to a GISC centre b. use DAR facilities to search the metadata then retrieve the file	a. The uploaded file has been delivered to the GISC and match with the corresponding metadata b. The file can be downloaded	
Centre		Organization	Country
Test Date			

Test Case Name: NC Demonstration Test Case 3		
Maintenance of users, roles, authorization and authentication		

Test Case ID	NC-TC3	

Component	Management of users and access	

Purpose of test

Create and exercise a variety of user types.
Note: A centre may use the GISC user control interface

Relevant Technical Specifications

- Tech specs 4 (Maintenance of User Identification and Role Information)
- Tech specs 6 (Authentication of a User)
- Tech specs 7 (Authorization of a User Role)
- Tech specs 13 (Maintenance of Dissemination Metadata)

Precondition

1. The Centre has authority to provide access to users (i.e. PR approval)
2. A process is in place between the NC and GISC for the Centre to authorize its users to use the GISC with appropriate access levels.
3. The user interface is via the internet (i.e. web page)

Test Steps

	Test Steps	Expected Results	Actual Results
1	cess for an external user to search	Temporary user can search metadata, but not access data from the GISC or cache, or subscribe to data.	
	es to search web page kes metadata search access data	a) User has access to search page b) User finds metadata c) User tries to access data and is referred to authorisation page at data source. Cannot access data without validating in an authorized user role	
	punts with access to WIS metadata and WMO centre authorized user	Two users are created. One with access to metadata only, the other with the ability to access the Centre subscription service or ad hoc request from the cache	
2	es to registered user web page equired to login or create account isters account and selects role of valid ember with authority to access WIS data om WMO NC) ers login details kes metadata search	a) User has access to login page b) New user, so has to create an account c) User account is validated as a WMO NC member and account is created. The user receives a user login (eg code via email or encrypted symbol) d) User is logged in. As user us validated as WMO NC member, he is allocated access to search and access to download data from cache and to subscription services	

	f) Tries to access WMO globally available data from the centre g) User tries to access additional data at centre that he is not authorized to access h) Tries to access data or product at another site i) User subscribes to data for future delivery from centre j) User returns on another session and reuses login to search or subscribe k) User edits subscription details l) User cancels a subscription m) User logs out or leaves centre's site and tries to return to a bookmarked page at a later date and access data	e) User finds metadata f) User successfully accesses data from centre g) User receives advice that he is not authorized to access this data and referred to access page where he can request change in user role or re-login as another user h) User is referred to authorisation page at other site. i) User receives scheduled data via agreed method at agreed time j) User maintains successful access with same access rights k) Users subscription details are updated and reflected in subsequent deliveries l) Users subscription details are updated and receives no further deliveries m) Attempting to use a bookmarked page from earlier session to access data, directs the user to the registered user login page.	
4	User checks status of account and subscriptions	User can view his account and subscription details, including historic and future transactions, and the status of current transactions	
...			

Centre		Organization	Country
Test Date			

Annex 5 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM COMPETENCIES

The provision of World Meteorological Organization Information System (WIS) services within a National Meteorological and Hydrological Service (NMHS) or related services might be accomplished by a variety of skilled personnel, including project managers, engineers, technicians, and IT personnel. Personnel in third party organizations (e.g. universities, international and regional institutions and centres, and private sector companies) and other providers might also supply data, products and information for the WIS service(s).

This document sets out a competency framework for personnel involved in the provision of WIS services, but it is not necessary that each person has the full set of competencies. However, within specific application conditions (see below), which will be different for each organization, it is expected that any institution providing WIS services will have staff members somewhere within the organization who together demonstrate all the competencies at the institution's infrastructural capacity level. The Performance and Knowledge Requirements that support the competencies should be customized based on the particular context of an organization. However the general criteria and requirements provided here will apply in most circumstances.

APPLICATION CONDITIONS

A.   The organizational context, priorities and stakeholder requirements

B.   The way in which internal and external personnel are used to provide WIS services

C.   The available resources and capabilities (financial, human, technological, and facilities), and organizational structures, policies and procedures

D.   National and institutional legislation, rules and procedures

COMPETENCIES

Infrastructure

1   Manage the physical infrastructure

2   Manage the operational applications

Data

3   Manage the data flow

4   Manage the data discovery

External Interactions

5   Manage WIS centre-centre interactions

6   Manage external user interactions

Overall service

7   Manage the operational service

COMPETENCY 1: MANAGE THE PHYSICAL INFRASTRUCTURE

Competency description

Prepare, plan, design, procure, implement and operate the physical infrastructure, networks and applications required to support the WIS centre

Performance components

IT operations control

1.   Maintain the system in optimal operational condition by setting and meeting service levels, including:
     • configuration
     • preventative and corrective maintenance and servicing
     • equipment replacement or upgrade
     • networking and processing capacity
     • systems monitoring and reporting on and corrective actions

2.   Contingency planning, operations backup and operations restore

Facilities management

3.   Manage physical site security

4.   Manage physical site environmental control

Knowledge and skill requirements
     • General ICT skills
     • Operation, configuration and maintenance of equipment and applications
     • Recognized IT service management frameworks
     • Current technologies and emerging trends
     • Service level agreements

COMPETENCY 2: MANAGE THE OPERATIONAL APPLICATIONS

Competency description

Prepare, plan, design, procure, implement and operate the applications required to support the WIS functions

Performance components

1.   Meet service levels by maintaining applications in optimal operational condition, through:
     • configuration of applications
     • monitoring and responding to applications' behaviour
     • preventative and corrective maintenance
     • replacement or upgrade of applications

2.   Contingency planning and application backup and application restore

3.   Ensure data integrity and completeness in the event of system failure

4.   Ensure system security

Knowledge and skill requirements

- General ICT skills
- Operation, configuration and maintenance of applications
- Recognized IT service management frameworks
- Current technologies and emerging trends
- WIS functions and requirements
- WIS security policies

COMPETENCY 3: MANAGE THE DATA FLOW

Competency description

Manage the collection, processing and distribution of data and products through scheduled and on-demand services

Performance components

1   Ensure collection and distribution of data and products as per data policy

2   Publish data and products

3   Subscribe to data and products

4   Encode, decode, validate and package data and products

5   Create, update and maintain data flow catalogues

6   Manage connectivity between centres

7   Control the data flow to meet service levels

Knowledge and skill requirements

- System and network monitoring and viewing tools
- Data formats and protocols
- Licensing and data policies
- Message and file switching systems

COMPETENCY 4: MANAGE THE DATA DISCOVERY

Competency description

Create and maintain discovery metadata records describing services and information and upload to the WIS DAR catalogue

Performance components

1   Create and maintain discovery metadata records describing products and services

2   Add, replace or delete metadata records within the catalogue

3   Ensure that all information and service offerings from a WIS centre have complete, valid and meaningful discovery metadata records uploaded to the catalogue

Knowledge and skill requirements

- WMO and/or ISO docs e.g., complete and valid records
- Metadata entry and management tools
- Policies
- Discovery metadata concepts and formats
- Written English

COMPETENCY 5: MANAGE WIS CENTRE-CENTRE INTERACTIONS

Competency description

Manage relationships and compliance between your centre and other WIS centres

Performance components

1   Exchange information with other centres on operational matters

2   Facilitate registration of new WIS centres

3   Facilitate registration of new data and products by other WIS centres

4   Create and respond to WIS service messages, including GTS

Knowledge and skill requirements

- Knowledge of current exchanges and requirements for notification of operational changes
- Procedures and practices for registration of other centres and their data and products
- Service level agreements
- Written English

COMPETENCY 6: MANAGE EXTERNAL USER INTERACTIONS

Competency description

Ensure users, including data providers and subscribers, can publish and access data and products through WIS

Performance components

1   Register data providers and subscribers and maintain a service agreement

2   Set and register access criteria

3   Provide systems and support for users to publish and access data and products

4   Manage user relations to ensure a high satisfaction level

Knowledge and skill requirements

- Data policies
- External WIS interface
- WIS registration and monitoring tools and policies
- User support documentation and help files
- Written English

COMPETENCY 7: MANAGE THE OPERATIONAL SERVICE

Competency description

Ensure the quality and continuity of the service

Performance components

1   Coordinate all WIS functions and activities of the centre

2   Ensure and demonstrate compliance with regulations and policies

3   Monitor and meet quality and service performance standards

4   Ensure service continuity through risk management, planning and implementation of service contingency service backup and service restore, and ensure data continuity in the event of system failure

5   Plan and coordinate the delivery of new functionality

Knowledge and skill requirements

 • General management skills

 • Overview of local and external WIS operations and associated service agreements

 • WIS regulations and policies

 • Functional specification

 • Written English

Annex 6 to Recommendation 21 (CBS-Ext.(2014))

WMO INFORMATION SYSTEM TRAINING AND LEARNING GUIDE

This guide is to assist trainers in the development and running of training courses for WIS personnel and to guide learners in what is expected of them. As this is a guide, it is not mandatory that you precisely follow its directions. You may find more appropriate ways for you to teach or learn something. However, it is essential that the learning outcomes are met.

This guide is not a syllabus. A syllabus is essentially a list of topics without indications of learning outcomes or how the learning is to be demonstrated. With a competency based approach, the focus is on learners acquiring and demonstrating the required competencies, rather than things that are "nice for them to know".

This guide covers the whole gamut of competencies required for people working with WIS. It is important to note that these are the competencies required in a large WIS centre where they would normally be shared across a number of personnel. Although different WIS Centres may have the same competencies, the components and complexity and depth of each may vary. Further, an individual competency or component may not be required at a particular centre (if that work is not performed there) or by individuals within the centre.

Thus, the training should be tailored to each individual's needs. These learning needs will depend on what is required to perform their work and what competencies and skills they already possess (recognition of prior competence). Training should be to fill these gaps, not to cover all of the possible content.

In a small centre, not all of the competencies are likely to be required. In any case, each individual working with WIS needs to be able to show that they are competent to perform those tasks which they are required to do. Where they already possess skills and are able to demonstrate competence against the assessment criteria (recognition of prior competence) they will be exempt from those sections of the training.

COMPETENCIES

Infrastructure

1   Manage the physical infrastructure

2   Manage the operational applications

Data

3   Manage the data flow

4   Manage the data discovery

External Interactions

5   Manage WIS centre-centre interactions

6   Manage external user interactions

Overall service

7   Manage the operational service

IN AND OUT OF SCOPE

Staff are expected to have standard professional skills and capabilities. The emphasis here is on WIS specific skills. Training in generic skills such as ICT systems and standard applications, networking, maintenance, database skills, project management, etc. would normally be outsourced or part of a person's training prior to working in the centre. The same applies to team-working and generic management skills.

ASSESSMENT

It is essential to ensure learning is transferred from the learning environment into operations. Assessment should thus simulate the operational conditions as closely as practicable. The emphasis is on what people are able to do, under the conditions in which they are required to do it, and with the tools they would normally use, rather than on what they know.

Examples of suitable assessment types include:

- Demonstrated performance
- Portfolio of examples of work they have done
- Recognition of prior competence
- Supervisor assessment certifying their competency – based on evidence of prior performance or working under supervision

As competency needs to be maintained on an ongoing basis continuing assessment may be required. This would normally be on a periodic basis at a frequency appropriate for the particular competency.

Competency based assessment means that staff are deemed capable of performing the job, not that they receive a pass mark of say 60%.

TYPES OF TRAINING

This document is not meant to be prescriptive in how training should be performed but offers some suggestions. Any mode of training is acceptable, as long as it is effective and the outcomes can be assessed against the competencies. It will depend on the competency to be assessed, the size of the WIS centre, available resources, and other factors.

Some forms of training that would be appropriate include:

- Working under supervision (on the job)
- Mentoring
- Self-directed study
- Internal or external courses (online or classroom), especially for generic skills
- Scenario based activities, including use cases
- Role plays, especially for external interactions

KEY LEARNING RESOURCES

- The key documents, along with their references, explaining the operation of WIS are:
- WMO-No. 1060 *Manual on the WMO Information System*
- WMO-No. 1061 *Guide to the WMO Information System*
- Use cases – for learning and for assessment – still need to reference these

UPDATES

As the training for WIS evolves it is expected that so, too, will this guide. Suggestions of ways to improve the document and ideas about how the training can be conducted are always welcome and should be sent to: wis-help@wmo.int

COMPETENCY 1: MANAGE THE PHYSICAL INFRASTRUCTURE

Prepare, plan, design, procure, implement and operate the physical infrastructure, networks and applications required to support the WIS centre.

Many of these skills are generic ITC skills and will have already been attained as part of prior education and training or will be provided by hardware and systems suppliers.

COMPETENCIES COMPONENTS

IT operations control

1   Maintain the system in optimal operational condition by setting and meeting service levels, including:

- configuration
- preventative and corrective maintenance and servicing
- equipment replacement or upgrade
- networking and processing capacity
- systems monitoring, reporting and corrective actions

2   Contingency planning, operations backup and operations restore

Facilities management

3   Manage physical site security

4   Manage physical site environmental control

Learning outcomes

You will be able to:

- Maintain the system in optimal operational condition
- Plan for upgrades, operations backups and operations restores
- Maintain site security and environmental control

You will learn:

- WIS specific systems
- WIS site security policies
- Service level agreements for your centre

Learning activities

To learn how to perform these job tasks you may:

- Attend training by systems and other outside providers
- Respond to typical monitoring reports
- Apply WIS site security measures and respond to typical incidents
- Apply WIS site environmental control measures and respond to typical incidents

Assessment

You must be able to:

- Configure and maintain system components
- Respond to monitoring reports
- Apply WIS site security measures and respond to typical incidents
- Apply WIS site environmental control measures and respond to typical incidents

Underpinning knowledge and skills

- General ICT skills
- Current technologies and emerging trends
- Recognized IT service management frameworks
- Service level agreements for your centre

Key learning resources

- Manufacturers' handbooks and guides
- Documentation of centre's facilities
- WIS/GTS manuals and guides
- Tools to monitor system security
- WIS security policies
- WIS environmental control policies

COMPETENCY 2: MANAGE THE OPERATIONAL APPLICATIONS

Prepare, plan, design, procure, implement and operate the applications required to support the WIS functions.

Many of these skills are generic ITC skills and will have already been attained as part of prior education and training or will be provided by applications suppliers.

Competencies components

1 Meet service levels by maintaining applications in optimal operational condition, through:
- configuration of applications
- monitoring and responding to applications' behaviour
- preventative and corrective maintenance
- replacement or upgrade of applications

2 Contingency planning, application backup and application restore

3 Ensure data integrity and completeness in the event of system failure

4 Ensure system security

Learning outcomes

You will be able to:
- Operate, configure and maintain applications
- Monitor applications and take corrective action
- Apply and test WIS security protocols

You will learn:
- WIS applications specific to your centre
- WIS system security policies and procedures

Learning activities

To learn how to perform these job tasks you may:
- Attend training by systems and other outside providers
- Initiate monitoring and reporting procedures and respond to typical monitoring reports
- Apply WIS site security measures and respond to typical incidents

Assessment

You must be able to:
- Configure and maintain system components
- Respond to monitoring reports
- Apply site security measures and respond to typical incidents

Underpinning knowledge and skills
- Current technologies and emerging trends
- WIS functions and requirements

- Recognized IT service management frameworks
- Service level agreements for your centre

Key learning resources

- Documentation of centre's applications
- WIS/GTS manuals and guides
- Tools to monitor system security
- WIS security policies

COMPETENCY 3: MANAGE THE DATA FLOW

Manage the collection, processing and distribution of data and products through scheduled and on-demand services.

Competencies components

1   Ensure collection and distribution of data and products as per data policy

2   Publish data and products

3   Subscribe to data and products

4   Encode, decode, validate and package data and products

5   Create, update and maintain data flow catalogues

6   Manage connectivity between centres

7   Control the data flow to meet service levels

Learning outcomes

You will be able to:

- Transfer data and products between your centre, other WIS centres, and external users
- Request data and respond to data requests using ad hoc and routine delivery mechanisms
- Maintain quality standards (service levels) by monitoring, and responding to, traffic flow, missing data and products, errors and service messages
- Apply relevant data policies to data and products
- Identify appropriate formats for data and product exchange
- Write and read data in WIS formats using your centre's tools

You will learn:

- Data representations used in WIS and when they are applicable
- WMO data policies and how data are associated with these in WIS
- The structure of the WIS and GTS and how to use reference documents to identify and interpret the routing plans and protocols you will need to use
- The interfaces of your centre's WIS applications, the information they use to modify their behaviour, and the tools available to control the operation of the applications to achieve service levels

- How to use a WIS centre interface to find and request data for delivery by ad hoc request and by subscription
- How WIS handles back-up and how the GTS handles alternative routings to maintain continuity of data flows

Learning activities

To learn how to perform these job tasks you may:

- Connect to a WIS centre to search for information, select a dataset, download a copy from the cache
- Using a WIS centre interface, create, modify and delete a subscription for routine delivery of a dataset
- Use the software tools used by your centre's WIS application to exchange information between computers
- Assess data flows by analysing monitoring reports from your applications
- Investigate how data policy (including WMO Resolutions 25 and 40) is applied to data published by your centre
- Use tools provided at your centre to view information in different formats and convert data between these formats

Assessment

You must be able to:

- Go to a WIS centre, find data, download it immediately, subscribe for regular delivery and cancel the subscription
- GTS component: Use a switch to move data between training computers and control the flow

Underpinning knowledge and skills

- Internet protocols
- Networking principles (local area networks and wide area networks) and associated monitoring and control technologies

Key learning resources

Data policies

- WMO Resolution 25 (Resolution 25 (Cg XIII) – Exchange of Hydrological Data and Products)
- WMO Resolution 40 (Resolution 40 (Cg-XII) – WMO policy and practice for the exchange of meteorological and related data and products including guidelines on the relationships in commercial meteorological activities
- Centre's data policies

GTS data exchange

- *WMO-No. 386 Manual on the Global Telecommunication System*
  - Attachment II-5 of the *Manual on the Global Telecommunication System* (data designators)
  - Attachment II-6 of the *Manual on the Global Telecommunication System* (format of addressed messages)
  - Attachment II-7 of the *Manual on the Global Telecommunication System* (routing catalogues)

– Attachment II-15 of the *Manual on the Global Telecommunication System* (section on *FTP procedures and file naming convention*)

– Attachment II-16 of the *Manual on the Global Telecommunication System* (procedures for transmitting and collecting meteorological bulletins using e-mail and web)

Data representations

- WMO-No. 306 *Manual on Codes – International Codes*, Volume I.1: *Part A – Alphanumeric Codes*

- WMO-No. 306 *Manual on Codes – International Codes*, Volume I.2: *Part B and Part C*

- Guidance on migration to table driven code forms (http://www.wmo.int/pages/prog/www/WMOCodes.html#Codes)

- Tools used at centre to read, write, convert, validate and display information in Table Driven Code Forms

- Sample data for reading and writing in Table Driven Code Forms

WIS discovery, access and retrieval

- WMO-No. 1060 M*anual on the WMO Information System*
  - Man on WIS (WMO-No 1060/Annex VII to WMO-No 49) Part 2 para 2.4.1, Part 3 para 3.4, Part 4 para 4.3, 4.11, 4.12, 4.13, Part 1 para 1.7), and the corresponding sections of the Guide to WIS.
  - WIS compliance specification Part 2 para 2.4.

- WMO-No. 1061 *Guide to the WMO Information System*

- User account at a GISC and PC with internet connection

Managing GTS data exchange

- *WMO-No. 386 Manual on the Global Telecommunication System*

- WMO-No. 9 *Weather Reporting*, Volume C1: *Catalogue of Metaeorological Bulletins*

- Global Telecommunication System routing tables

- Training environment on message and file switch

- World Weather Watch quantity monitoring statistics

Security of data exchange

- *WMO-No. 1116 Guide to Virtual Private Networks (VPN) via the Internet between GTS centres*

- WMO-No. 1115 *Guide to Information Technology Security*

Network management

- Network Management tool and associated documentation

- System error reports and event viewing tools

COMPETENCY 4: MANAGE THE DATA DISCOVERY

Create and maintain discovery metadata records describing services and information and upload to the WIS DAR catalogue

Each data and product record held within WIS must have metadata associated with it in order to be able to discover it and to know what it means. These metadata records are held in a catalogue for discovery, access and retrieval (DAR).

Competencies components

1   Create and maintain discovery metadata records describing products and services

2   Add, replace or delete metadata records within the catalogue

3   Ensure that all information and service offerings from a WIS centre have complete, valid and meaningful discovery metadata records uploaded to the catalogue

Learning outcomes

You will be able to:

- Create discovery metadata from user supplied descriptions using standard WIS tools
- Add, replace or delete metadata records within the catalogue

You will learn:

- The role of discovery metadata in discovery, access and retrieval of data and products
- Approved metadata formats
- How to discriminate content that is mandatory, acceptable or inapplicable
- Use of metadata creation tools
- How to access and modify a catalogue
- How data flows within and to and from your centre
- Tools to allow users to input descriptions

Learning activities

To learn how to perform these job tasks you may:

- Create metadata records based on sample descriptions for a range of data and products typical for your WIS Centre
- Insert these into a catalogue, replace them with records which have been changed, and delete them

Assessment

You must be able to:

- Demonstrate successful creation of metadata records for typical products
- Demonstrate competence in publishing and deleting metadata catalogue records

Resources

- WIS Technical Specifications: WIS-TechSpec-9: Consolidated view of distributed Discovery, Access and Retrieval metadata catalogues
- WMO-No. 1060 *Manual on the WMO Information System*, Part 5, Core Metadata Profile
- WIS metadata guidance
- Metadata entry and management tools
- Samples of how to complete typical examples
- Metadata policies and WIS metadata guidelines
- ISO 191xx series: ISO standards on Geographic Information

COMPETENCY 5: MANAGE WIS CENTRE-CENTRE INTERACTIONS

Manage relationships and compliance between your centre and other WIS centres

Competencies components

1   Exchange information with other centres on operational matters

2   Facilitate registration of new WIS centres

3   Facilitate registration of new data and products by other WIS centres

4   Create and respond to WIS service messages, including GTS

Learning outcomes

You will be able to:

- Facilitate registration of new WIS centres and their data and products
- Keep other WIS centres informed of the status of services, incidents and requests
- Monitor and respond to service levels reports
- Manage subscriptions

You will learn:

- Knowledge of current exchanges and requirements for notification of operational changes
- What type of data, products and services are available at your centre
- Procedures and practices for registration of other centres and their data and products
- Procedures and practices for notifying other centres about operational changes and service availability

Learning activities

To learn how to perform these job tasks you may:

- Perform the above activities using software, tools and guidance as used in your operational environment, either in a classroom environment or under supervision on-the-job

Assessment

You must be able to:

- Respond to a request to register a new centre and its data and products
- Prepare notifications of typical operational scenarios
- Respond to typical notifications from other WIS centres

Resources

WMO

- Manual on GTS (WMO no 386)
- Manual on WIS (WMO No 1060)
- Part II, Centre Nomination Procedures
- Part IV, WIS Techspecs 4, 6, 7, 8 & 13

- Guide to the WIS (WMO 1061)
- Weather reporting (WMO No 9)
- Exchange of Meteorological Data (WMO No 837) (Resolution 25 & 40)

Local

- Service Level Agreements (as used by your centre)
- FAQ Documents (User centric)
- WIS software user guides
- Guidelines for services available at WIS centre
- Data policy and associated guidance material
- First line support procedures and guides
- User database (for contact information)
- Tools (could be whiteboard)
- Case tracking and customer management
- WIS user management
- WIS subscription management
- WIS components monitoring dashboard

COMPETENCY 6: MANAGE EXTERNAL USER INTERACTIONS

Ensure users, including other centres, data providers and subscribers, can publish and access data and products through WIS

Competencies components

1   Register data providers and subscribers and maintain a service agreement

2   Set and register access criteria

3   Provide systems and support for users to publish and access data and products

4   Manage user relations to ensure a high satisfaction level

Learning outcomes

You will be able to:

- Register new WIS users and providers, setting roles, access authorizations and levels
- Create and amend WIS users subscriptions
- Use WIS tools to assist users and providers to resolve problems
- Create and respond to WIS service messages, including GTS
- Undertake first-line investigation and diagnosis
- Manage incidents and requests: log them, categorize and prioritize them, escalate as appropriate and close them when the user is satisfied
- Keep users informed of the status of services, incidents and requests.
- Gather and report on user and provider satisfaction
- Assist users to upload and access data
- Identify potential problems in services and implement improvements

You will learn:

- What type of data, products and services are available at your centre
- How WIS applications are intended to be used, including discovery, access and retrieval (DAR)
- How to apply data policies
- How to interact effectively with users and providers

Learning activities

To learn how to perform these job tasks you may:

- Register users (data providers and subscribers) and set access authorizations and levels using software, tools and guidance as used in your operational environment
- Role play user interactions

Assessment

You must be able to:

- Register typical data providers and users
- Ensure users are able to upload and access data
- Respond to typical incidents

Resources

WMO

- Manual on GTS (WMO No 386)
- Manual on WIS (WMO No 1060)
- Part II, Centre Nomination Procedures
- Part IV, WIS Techspecs 4, 6, 7, 8 & 13
- Guide to the WIS (WMO 1061)
- Weather reporting (WMO No 9)
- Exchange of Meteorological Data (WMO No 837) (Resolution 25 & 40)

Local

- Service Level Agreements (as used by your centre)
- FAQ Documents (User centric)
- WIS software user guides
- Guidelines for services available at WIS centre
- Data policy and associated guidance material
- First line support procedures and guides
- User database (for contact information)
- Tools (could be whiteboard)
- Case tracking and customer management
- WIS user management
- WIS subscription management
- WIS components monitoring dashboard

COMPETENCY 7: MANAGE QUALITY, RISK AND OPERATIONAL SERVICE

Ensure the quality and continuity of the service

This is essentially a management role, ensuring that the WIS system operates as it is required to do, now and into the future. Some of these skills are generic management skills, rather than WIS specific, and would be taught or learnt elsewhere.

COMPETENCY COMPONENTS

1. Coordinate all WIS functions and activities of the centre

2. Set and monitor Centre regulations, policies and procedures to meet quality and service performance standards

3. Ensure service continuity through risk management, planning and implementation of service contingency, service backup and service restore, and ensure data continuity in the event of system failure

4. Plan and coordinate the delivery of new functionality and improvements

5. Ensure budgets are set and met

Learning outcomes

You will be able to:

- Ensure the WIS centre meets quality and service performance standards
- Identify the challenges and issues to address
- Foster compliance with WIS framework

You will learn:

- Functions and responsibilities of WIS centre
- WIS quality and service performance standards
- Methods to manage quality, risk and operational service
- How to monitor quality and service performance standards
- How to analyse quality and service performance in the WIS centre
- How to report quality and service performance
- How to demonstrate quality and service performance
- How to maintain troubleshooting and backup and restore procedures
- How to plan and coordinate the delivery of new functionality and improvements
- How to integrate new technologies and developments
- How to update the regulatory documents
- How to maintain service agreements
- How to plan monitoring resources
- How to align budget restrictions with human resources demands

Learning activities

To learn how to perform these job tasks you may:

- Monitor quality and service performance standards
- Analyse quality and service performance in the WIS centre

- Report quality and service performance
- Demonstrate quality and service performance
- Maintain troubleshooting and backup and restore procedures
- Plan and coordinate the delivery of new functionality
- Keep timely records, as required

Assessment

You must be able to:

- Demonstrate successful WIS service
- Plan successful procurement of replacement and upgrade of equipment and applications to meet new functionality and requirements

Resources

- Technical Regulations (WMO-No.49), Volume I
- Resolution 25 (Cg-XIII)
- Resolution 40 (Cg-XII)
  - *WMO-No. 386 Manual on the Global Telecommunication System*
  - WMO-No. 1060 *Manual on the WMO Information System*, WIS-TECHSPEC-15 (Reporting of quality of service)
  - WMO-No. 1061 *Guide to the WMO Information System*
  - WIS demonstration process procedures and guidelines
  - Monitoring reports
  - Audit reports

Recommendation 22 (CBS-Ext.(2014))

PROVISION OF OPERATIONAL METEOROLOGICAL ASSISTANCE TO HUMANITARIAN AGENCIES

THE COMMISSION FOR BASIC SYSTEMS,

Noting that the Executive Council at its sixty-sixth session requested the Commission to review the governance procedures relating to the provision and availability of information on meteorological, hydrological and other environmental hazards, with a view to developing appropriate guidance for consideration by the Seventeenth World Meteorological Congress,

Noting further:

(1)   The strategic priority afforded to Service Delivery issues for the seventeenth financial period,

(2)   That the success of the Global Framework for Climate Services will depend on the effective delivery of climate services to a wide variety of users,

(3)   The proliferation of non-authoritative sources of meteorological information accessible to the humanitarian agency community,

(4)   The mission of WMO and the primary role of National Meteorological and Hydrological Services in providing warnings of severe weather in support of the safety of life and mitigation of damage to property,

(5)   The request from the Executive Council at its sixty-sixth session that the Commission for Basic Systems and the Commission for Climatology consider the most appropriate and effective contribution to humanitarian agencies and the Early Warning Early Action Report of the Inter-Agency Standing Committee,

Considering the development of a liaison between WMO and the humanitarian agencies through the Commission for Basic Systems Task Team on the Provision of Operational Meteorological Assistance to Humanitarian Agencies, and the subsequent identification by the humanitarian community of its needs and requirements for operational meteorological and hydrological information and services,

Recommends that the roadmap outlined in the annex to the present recommendation be adopted and that the Commission coordinate the work with the other technical commissions in implementing the roadmap on behalf of WMO.

Annex to Recommendation 22 (CBS-Ext.(2014))

ROADMAP TO THE DEVELOPMENT OF GUIDANCE FOR THE PROVISION OF METEOROLOGICAL ASSISTANCE TO HUMANITARIAN AGENCIES

1.   Requirements for operational meteorological and hydrological products and services by Humanitarian Agencies.

a.   Humanitarian Agencies, like many other entities that operate in a global context, have a need for meteorological and hydrological information on **all** spatial **scales** from global to local, and all time scales from minutes to decades, as well as historical information;

Humanitarian Agencies would welcome an active and **sustained engagement** with the WMO community;

They need this information to be provided from one contact point (at global, regional and national levels) available 24/7 as required by their operational needs, presented in a consistent, easily-understandable manner, using narrative text and visuals, **tailored** to their specific needs (this is essential);

They need this provision of information to be augmented by consultation and **interpretation** to enable the full value of the information to be translated into efficient and effective action (this is essential);

They would like a mechanism to be established to facilitate **two-way communication** and exchange of information between the meteorological and humanitarian communities;

They would like information (data, warnings) to be readily available, ideally with appropriate metadata if possible; and for the information to be formatted for ingestion into commonly used systems (**geo-referenced**);

Training on meteorological/hydrological concepts is needed, which includes engagement with exercises, workshops and discussion fora;

They would welcome evaluation and verification of meteorological products and services as elements in the **validation** of authoritative advice.

2.   Roadmap for what WMO needs to do in the short term to support Humanitarian Agencies

a.   Realizing the diversity of humanitarian agencies in mission, focus, capabilities, and scale, establish a definition or description of humanitarian agencies for purposes of clearly establishing and gathering requirements;

b.   Recognize and promote to the Humanitarian Agencies the strengths of the WMO community, such as:

   i.   The harmonization of data policies;

   ii.   The availability of information via WIS etc;

   iii.   The activities, organizational structure and operations of the Global Data-processing and Forecasting System (GDPFS) at global, regional and national levels;

   iv.   The advances in forecasting at all time scales, including the advent of operational seamless data-processing and forecasting;

c.   Refine the requirements itemized in 1. above;

d.   Clarify, and define where necessary, the responsibility of existing centres for the provision of products appropriate to the Humanitarian Agencies on global, regional and national scales, and develop protocols for provision of global and regional guidance to Humanitarian Agencies (see diagram below);

e.   Design, create and test a mechanism for the delivery of services with the Humanitarian Agency community, taking into account their needs for consultation, interpretation and two-way engagement, and following best practices in collaborative decision-making and validation;

f.   Recognizing the successful development of the meteorological and hydrological products and services (e.g. through the implementation of the Severe Weather Forecasting Demonstration Project (SWFDP), the Global Seasonal Climate Update (GSCU, on a trial basis), and the Flash Flood Guidance System (FFGS)), to request the relevant Technical Commission's Expert and/or Task Teams to assist in the development of the protocols mentioned in item c. above;

g.   Strengthen the engagement of the WMO community with the Inter-Agency Standing Committee (IASC) by nominating a suitable representative(s), to assist with the preparation of the Early Warning / Early Action (EW/EA) report and to provide feedback both to the CBS Task Team and to the Members, as appropriate, where potential environmental impacts have been identified;

h.   Recognizing the issues raised at EC-66 regarding the Global Disaster Alert Coordination System (GDACS), to engage with the EU JRC to promote access to, use of, and attribution of authoritative information sources on GDACS, while encouraging unofficial or experimental sources be clearly noted with proper caveats;

i.   Organize a joint HA/WMO workshop in Geneva to:

   i.   Perform a test phase with one region…;

ii.   Begin to define training needs (including cross-training);

iii.   Consult on the development of prototype services for the provision of operational meteorological assistance by NMHSs to HAs at a national level;

iv.   Design and agree to propose to CBS Management Group the reporting and governance arrangements relating to the provision of information services from the WMO community to the Humanitarian Agencies;

v.   Review and revise current arrangements exist for providing information to Humanitarian Agencies (as defined in Appendix I-5 of the *Manual on the Global Data-processing and Forecasting System* (GDPFS), WMO-No. 485) (as outlined in the diagram below), which may need to be re-invigorated, implemented and reinforced.

3.   Roadmap for what WMO needs to do in the medium-to-long term.

a.   Following continued validation and testing of the prototype, implement the mechanisms for the operational delivery of services as defined in 4d above;

b.   WMO needs to keep in sight that meteorological conditions may impact significantly on non-meteorological crises;

c.   Based upon clear requirements developed and identified in collaboration with humanitarian agencies, improve, as appropriate and needed, the supply of geo-referenced information and other metadata;

d.   Provide guidance and assistance to Members in developing a legal framework that would strengthen and support the role of NMHSs as authoritative providers of warnings of high impact weather.