WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

CIMO-17 outcomes and CIMO activities – Quality management

Krunoslav Premec
(WMO Secretariat)

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

(Tokyo, Japan, 6 - 9 March 2019)

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CIMO in General

WMO Commission for Instruments and Methods of Observation (CIMO)

- established in 1951 by Cg I (Paris, France)

1st session:

- 10 Aug – 4 Sept 1953, Toronto (Canada)

- 18 principal delegates of 51 members (quorum was 17)

Last session:

- 12 – 16 Oct 2018, Amsterdam (the Netherlands)

- 52 principal delegates of 122 members with voting rights (quorum was 41)

CIMO shall be responsible:

Resolution 43 (Cg-XVI)

- for matters relating to **international standardization, compatibility and sustainability** of instruments and methods of observation of meteorological, climatological, hydrological, marine, and related geophysical and environmental variables.

This responsibility:

- underpins all observations within WIGOS, and will be carried out in close consultation with relevant WMO partner organizations that co-sponsor, own and/or operate some of the observing systems;
- also extends to supporting the requirements of WMO cross-cutting activities such as the GFCS, DRR and Capacity Building.

CIMO key activities:

(a) Respond to the requirements for **standardized and compatible observations**, including data content, quality, metadata and observational product generation;

(b) Provide advice, and recommendations, and promote studies concerning **effective and sustainable use of instruments and methods of observation**, including quality management procedures such as methods for testing, preventive maintenance, calibration and quality assurance;

(c) Conduct and/or coordinate global and regional **instrument intercomparisons and performance testing** of instruments and methods of observation;

(d) In collaboration with the other international organizations, such as BIPM and ISO, promote the **development of measurement traceability to recognized international standards (SI**), including reference instruments within a hierarchy of world, regional, national and lead centres for instrument calibration, development and testing;

CIMO key activities:

(e) Promote **compatibility, intercomparison, integration and inter-operability** within and **between, space-based and surface-based (in situ and remote-sensing) observations**, including conducting testbed observing experiments;

(f) Encourage **research and development of new approaches** in the field of instruments and methods of observation of meteorological, climatological, hydrological, marine, and related geophysical and environmental variables;

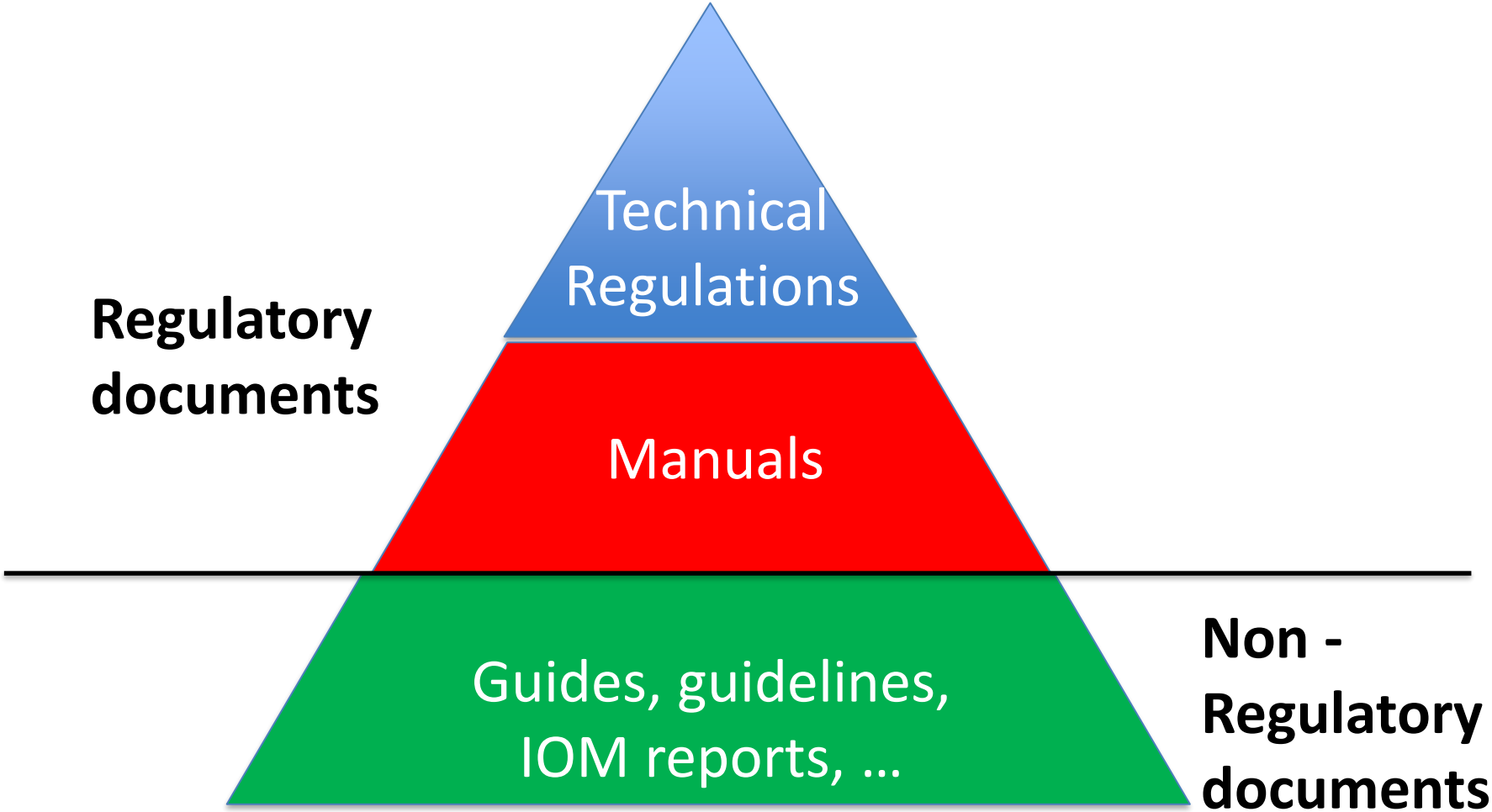
(g) Promote the **appropriate and economical production** of instruments and methods of observation with particular attention to the needs of developing countries;

(h) Support **training and capacity-building** activities in the area of instruments and methods of observation;

(i) **Liaise with the scientific research community and instrument manufacturers** to evaluate and to introduce new observing systems into operations.

WMO/CIMO Documentation

WMO Documentation:



The Technical Regulations comprise:

- **standard practices and procedures (shall)**

- Members are required to follow or implement and inform the Secretary-General, of any change in the degree of their implementation;

- have the status of requirements in a technical resolution.

- **recommended practices and procedures (should)**

- Members are urged to comply;

- have the status of recommendations.

WMO Basic Documents Series (regulatory):

- No. 1: Basic Documents;
- No. 2: Technical Regulations;

I – General meteorological standards and recommended practices;

II – Meteorological service for international air navigation;

III – Hydrology.

- Annexes to the Technical Regulations (Manuals);
- No. 3: Agreements and Working Arrangements with Other International Organizations.

Annexes to the Technical Regulations:

I. **International Cloud Atlas (WMO-No. 407) – Manual on the Observation of Clouds and Other Meteors;**
II. **Manual on Codes (WMO-No. 306), Vol. I;**
III. **Manual on the Global Telecommunication System (WMO-No. 386);**
IV. **Manual on the Global Data-processing and Forecasting System (WMO-No. 485);**
V. **Manual on the Global Observing System (WMO-No. 544), Vol. I;**
VI. **Manual on Marine Meteorological Services (WMO-No. 558), Vol. I;**
VII. **Manual on the WMO Information System (WMO-No. 1060);**
VIII. **Manual on the WMO Integrated Global Observing System (WMO-No. 1160).**

Publications under CIMO

- **International Cloud Atlas - Manual on the Observation of Clouds and Other Meteors (WMO-No. 407)**

- https://cloudatlas.wmo.int/home.html;

- first ever fully web-based WMO manual.

- **Guide to ~~International Meteorological~~ Instruments and ~~Observing Practice~~ Methods of Observation (WMO-No.8)**

- 1st edition in 1954 (12 chapters);
- 2018 edition: 5 Volumes (40 chapters, approx. 1500 pages);
- Includes 3 common WMO/ISO standards.

The CIMO Guide:

- guidance on the most effective practices for measurements and observations to achieve a standard quality;
- practical advice on techniques which are well established and in regular use, from the simplest to the most complex and sophisticated;
- authoritative reference for all matters related to instrumentation and methods of observation in the context of WIGOS.

2018

GUIDE TO METEOROLOGICAL INSTRUMENTS AND METHODS OF OBSERVATION (WMO-No. 8, CIMO Guide)

Part	Title
I	MEASUREMENT OF METEOROLOGICAL VARIABLES
II	OBSERVING SYSTEMS
III	SPACE-BASED OBSERVING SYSTEMS
IV	QUALITY ASSURANCE AND MANAGEMENT OF OBSERVING SYSTEM

2018

GUIDE TO INSTRUMENTS AND METHODS OF OBSERVATION (WMO-No. 8, CIMO Guide)

Vol.	Title
I	MEASUREMENT OF METEOROLOGICAL VARIABLES
II	MEASUREMENT OF CRYOSPHERIC VARIABLES
III	OBSERVING SYSTEMS
IV	SPACE-BASED OBSERVING SYSTEMS
V	QUALITY ASSURANCE AND MANAGEMENT OF OBSERVING SYSTEM

Vol V	QUALITY ASSURANCE AND MANAGEMENT OF OBSERVING SYSTEM
1	Quality management
2	Sampling meteorological variables
3	Data reduction
4	Testing, calibration and intercomparison
5	Training of instrument specialists

COMPETENCY FRAMEWORKS for:

1) **PERSONNEL PERFORMING METEOROLOGICAL OBSERVATIONS;**
2) **PERSONNEL INSTALLING AND MAINTAINING INSTRUMENTATION;**
3) **PERSONNEL PERFORMING INSTRUMENT CALIBRATIONS;**
4) **PERSONNEL MANAGING OBSERVING PROGRAMMES AND NETWORKS.**

Common WMO/ISO standards:

1) **SITING CLASSIFICATIONS FOR SURFACE OBSERVING STATIONS ON LAND** *(Volume I, Chapter 1,), (ISO 9289:2014(E)).*

2) **GROUND-BASED REMOTE-SENSING OF WIND BY HETERODYNE PULSED DOPPLER LIDAR** *(Volume III, Chapter 5),* (ISO *28902-2:2017(E)).*

3) **WEATHER RADARS – PART 1: SYSTEM PERFORMANCE AND OPERATION** *(Volume III, Chapter 7),* (ISO 19916-1 *:2019(E)).*

CIMO-related Centres in RA - II

WMO OMM

RICs and RMIC in RA-II:

- **RIC at Beijing, China**
https://www.wmo.int/pages/prog/www/IMOP/RICs/RIC_China.html.

- **RIC at Tsukuba, Japan**
https://www.wmo.int/pages/prog/www/IMOP/RICs/RIC_Japan.html.

- **RMIC- National Centre of Ocean Standards and Metrology (NCOSM), State Oceanic Administration of China, Tianjin China.**

RRC in RA-II:

- **RRC Pune, India.**
- **RRC Tokyo, Japan.**

Testbed and Lead Centres in RA-II:

- WMO-CIMO Testbed for Doppler Light Detection and Ranging (LIDAR) Systems for Aviation Applications (Hong Kong, China).
- WMO-CIMO Testbed for Integration of 3D Weather Observation System (Boseong, Republic of Korea).
- WMO-CIMO Lead Centre on Evaluation of Precipitation Measurement Accuracy (Chupungnyeong, Republic of Korea).

RTCs in RA-II:

- Nanjing University of Information, Science and Technology, Nanjing; and China Meteorological Administration Training Centre, Beijing, China.
- Central Training Institute and National Water Academy, Pune; India Meteorological Department Training Centre, New Delhi; and Indian Institute of Technology Roorkee, Roorkee, India.
- Islamic Republic of Iran Meteorological Organization, Tehran, Iran (Islamic Republic of).
- Iraqi Meteorological Organization, Baghdad, Iraq.
- Qatar Aeronautical College, Doha, Qatar.
- Korea Meteorological Administration, Seoul, Republic of Korea.
- Tashkent Hydrometeorological Professional College, Tashkent, Uzbekistan.

CIMO-17
Brief summary

CIMO-17 brief summary

Amsterdam, the Netherlands, 12–16 October 2018

- 97 participants (13 % women);

- 9 resolutions;
- 36 decisions;
- 13 recommendations;

- New president: **Mr Bruce Forgan (Australia)**;
- New Vice-president: **Mr Bruce Hartley (New Zealand)**.

Abridged Final Report and Progress Report are available from: https://library.wmo.int/index.php?lvl=notice_display&id=20696#.XHlDoK5KuUl

Some selected CIMO-17 outcomes

- Resolution 1 (CIMO-17)

Governance and traceability of the atmospheric longwave radiance.

- Resolution 5 (CIMO-17)

Vision for the future of environmental measurements.

- Resolution 6 (CIMO-17)

Working structure of CIMO.

Focal points for DRR, GCW and Gender issues.

Some selected CIMO-17 outcomes

CIMO Members are:

Decision 2

- Invited to organize and conduct ICs and ILCs.

Decision 6:

- urged to submit their proposals for improvement of the Measurement Quality Classifications for Surface Observing Stations on Land to the Task Team on Classification Schemes, and to actively contribute to the work of the Task Team;
- Invited to implement this classification scheme.

Some selected CIMO-17 outcomes

Decision 7

CIMO welcomes the proposal from Italy and Japan to develop a feasibility study for, and conduct an **intercomparison of non-catching type precipitation instruments.**

IC will be organized jointly by the CIMO Lead Centre on Precipitation Intensity (Italy) and the Japan Meteorological Agency, in 2020-2021.

Some selected CIMO-17 outcomes

Decision 19

CIMO Management Group is requested to collaborate with Regional Associations towards promoting traceability of measurements throughout the Regions and in ensuring a regular assessment of the status of Regional Instruments Centres, especially in Regions I and III.

CIMO MG coordinator for RA-II:

Mr Changxing LI, CMA, China, licx@cma.gov.cn

Some selected CIMO-17 outcomes

Decision 24:

- Members hosting RICs are invited:

- to consider to extend the RICs capabilities to offer RMIC functions, in collaborating with other organizations;

- to investigate the feasibility of offering additional RMIC facilities or specific RMIC functions.

- RICs and RMICs are urged to collaborate in performing ILCs and other relevant activities.

Some selected CIMO-17 outcomes

Decision 28:

(1) CIMO president is requested to align relevant provisions of the WMO TRs and related guidance material concerning quality management for instruments and methods of observation with *TR* (WMO-No. 49), Volume I – General Meteorological Standards and Recommended Practices, Part VII – Quality Management;

(2) CIMO members are urged to ensure implementation of the new provisions, aimed at enhancing quality management practices and procedures.

Some selected CIMO-17 outcomes

Recommendation 1:

Capitalizing on the WMO Solid Precipitation Intercomparison Experiment.

Recommendation 2:

Terms of reference for Regional Instrument Centres.

Recommendation 3:

Nomination process for Regional Instrument Centres.

Some selected CIMO-17 outcomes

Recommendation 6:

- Members are urged to implement the **strategy for traceability assurance** and to establish calibration laboratories, as needed, to improve the traceability of measurements within their Region, according to their Regional WIGOS Implementation Plan;
- Members requiring assistance concerning the traceability of their national meteorological standards are invited to liaise with RICs to ensure the calibration of their reference instruments.

Some selected CIMO-17 outcomes

Recommendation 7:

Development of e-training tools utilizing the new web-based edition of the International Cloud Atlas (WMO-No. 407).

Recommendation 8:

Approval of common World Meteorological Organization-International Organization for Standardization standards.

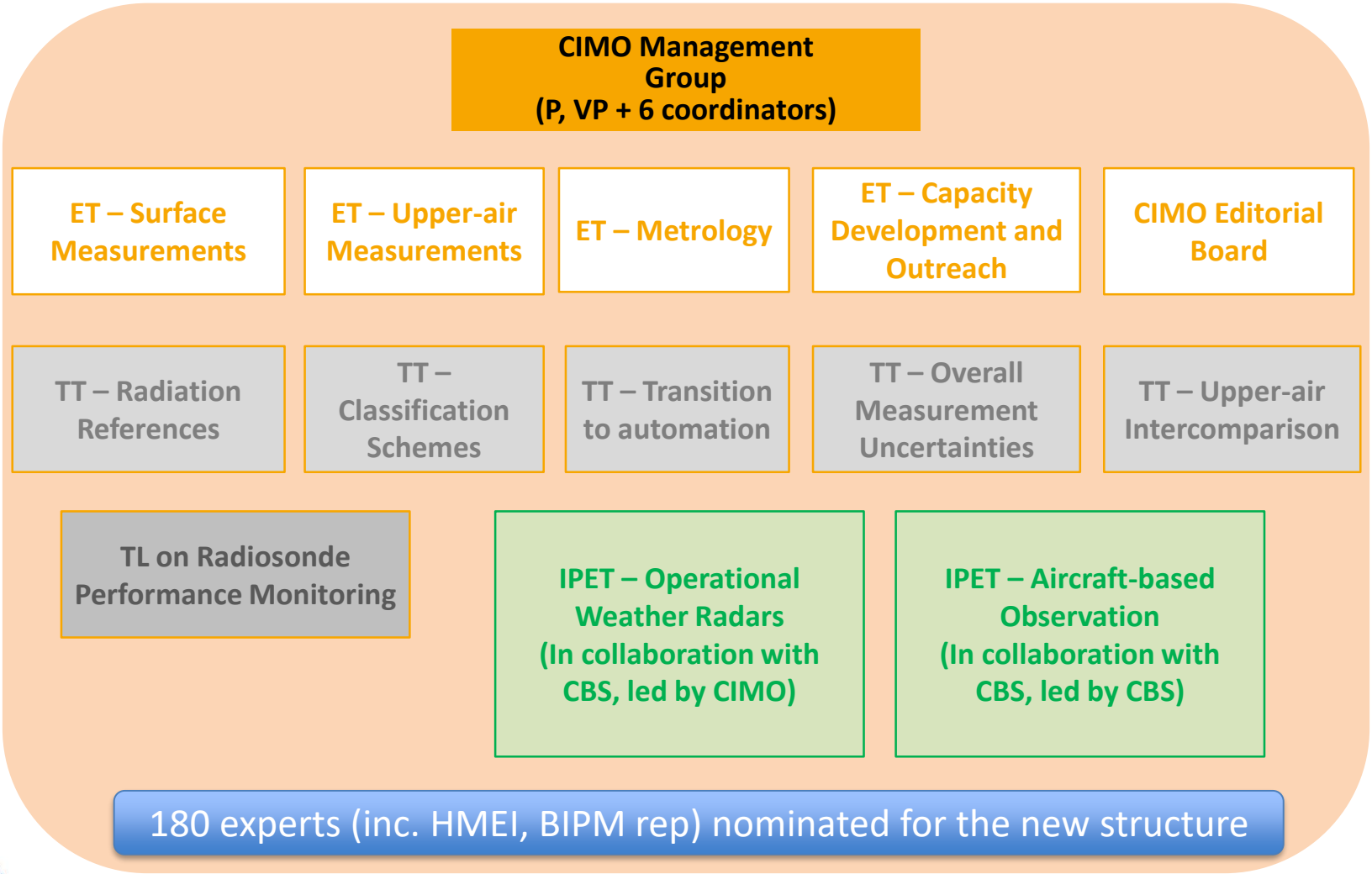
Some selected CIMO-17 outcomes

Recommendation 10:

Upper-air instrument intercomparison

- will take place in 2021 at DWD's Meteorological Observatory Lindenberg (Germany). The campaign will be organized under auspices of CIMO, with DWD and MeteoSwiss as local organizers.

CIMO Working Structure (CIMO-17)



CIMO in the Future - WMO CB reform

VISION FOR THE FUTURE OF ENVIRONMENTAL MEASUREMENTS (as adopted at CIMO-17)

Mission:
Fit-for-purpose environmental measurements through leadership, standards and guidance.

Vision:
The **WIGOS measurement community** is the recognized source of information and guidance on performing measurements for environmental intelligence.

VISION FOR THE FUTURE OF ENVIRONMENTAL MEASUREMENTS (as adopted at CIMO-17)

Desired Outcomes:

(a) The WIGOS measurement community are esteemed experts that gather and disseminate knowledge on measurements;

(b) Users and providers understand measurement quality and how fit-for-purpose measurements are achieved;

(c) Users and providers understand the importance of the measurement process in developing environmental intelligence.

(d) Users and providers of Essential Climate Variables are committed to measurement traceability;

(e) The potential, quality and performance characteristics of emerging measurement technologies and their products are documented in guidance material.

VISION FOR THE FUTURE OF ENVIRONMENTAL MEASUREMENTS (as adopted at CIMO-17)

Strategies to achieve the Mission and Vision:

(a) Collaborate effectively with users and providers of measurements;

(b) Develop and promote the implementation of recognized measurement practices;

(c) Develop and provide effective standards and guidance material;

(d) Provide guidance for the implementation of new measurement technology; and

(e) Identify and characterize the potential of emerging measurements.

WMO - CB reform

8 Technical Commissions

- CAeM
- CAgM
- CAS
- CBS
- CCl
- CHy
- CIMO
- JCOMM

2 Technical Commissions

- Infrastructure Commission
- Application Commission

WMO - CB reform

Commission for Observation, Infrastructure and Information Systems (Infrastructure Commission)

Standing Committees:

1) Earth observing systems and monitoring networks;

2) **Methods of observations, measurement and instrumentation;**

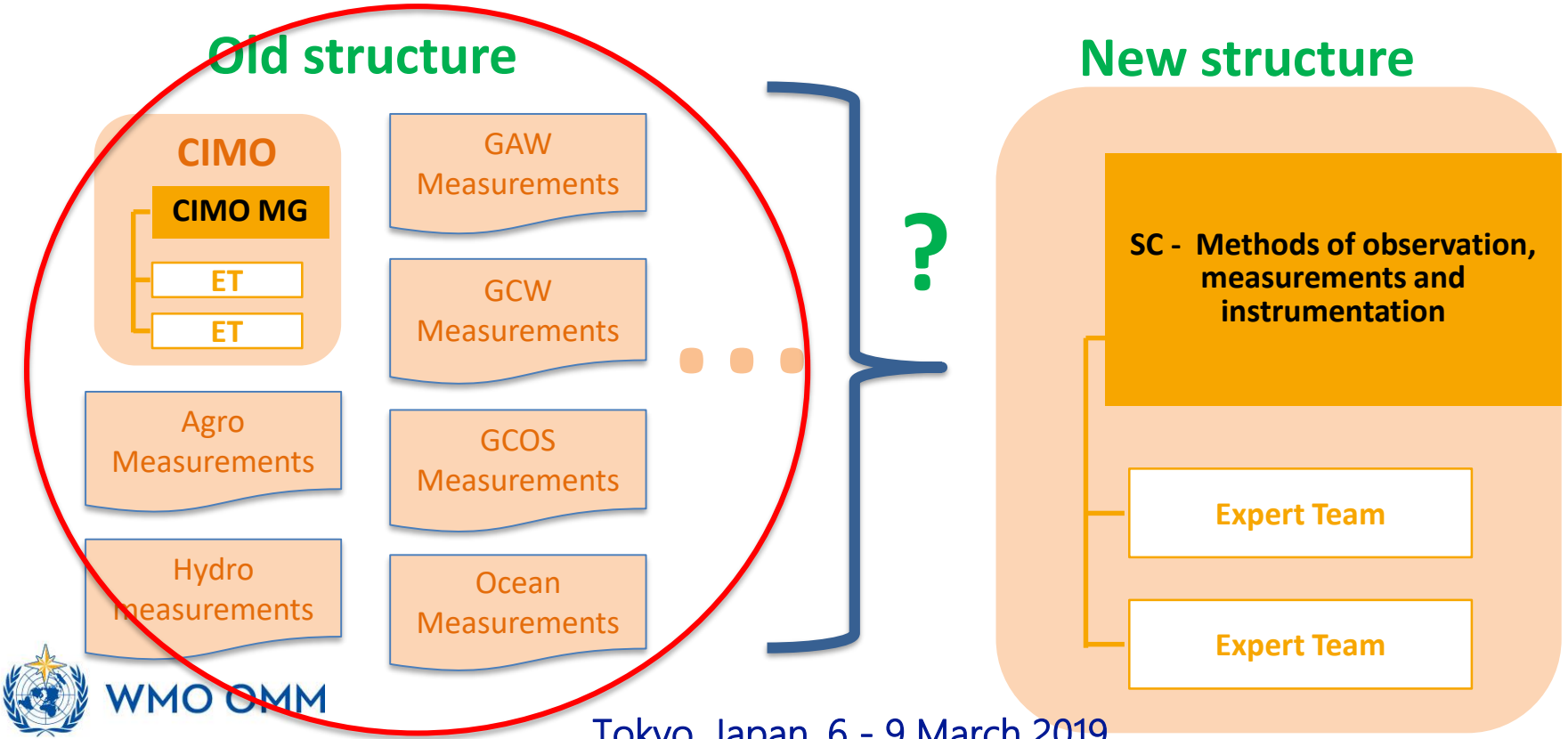
3) Data, products and information exchange and life cycle management;

4) Data processing for applied Earth system modelling and prediction.

More information at: https://public.wmo.int/en/governance-reform

CB reform is NOT: Transition 1:1

CB reform is: Integration, through collaboration, towards optimal use of Member and Secretariat resources



WMO Strategic Plan

Long-term Goals

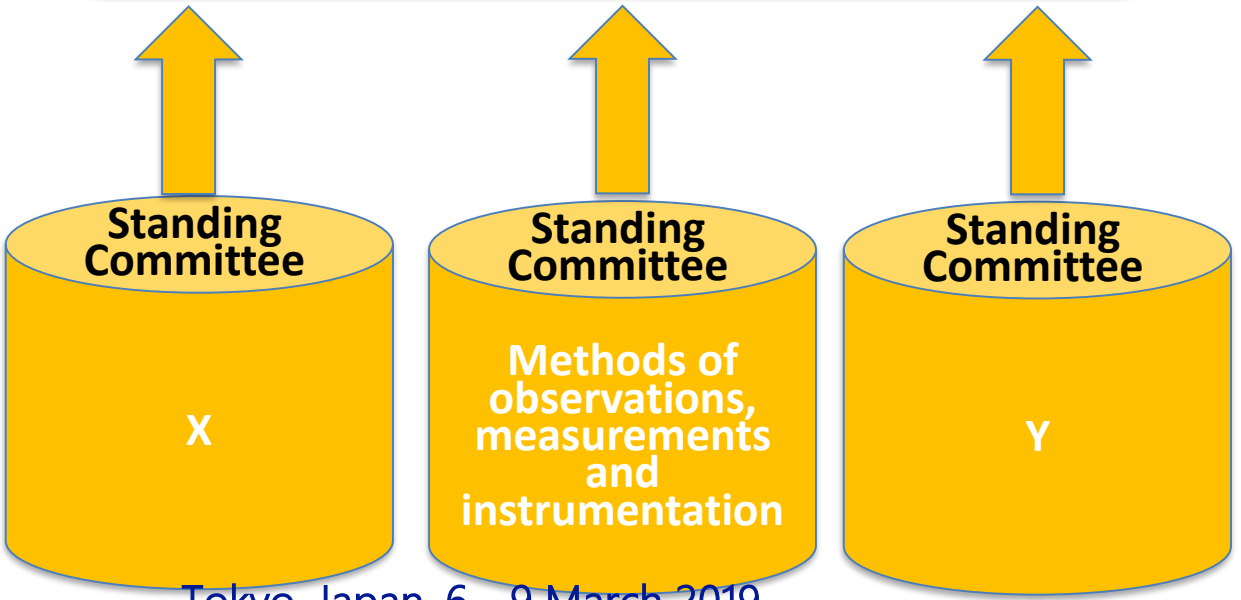
2. Enhance Earth system observations and predictions:

Strengthening the technical foundation for the future

Strategic Objectives 2020-2023

2.1 Data acquisition:

Optimize acquisition of observations through the WMO Integrated Global Observing System to support all WMO application areas.



WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Thank you
Merci

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