IMS/IDC Operational Manuals – Part of the Framework Governing the O&M Activity in the IMS network

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Outline

• International Monitoring System (IMS) / International Data Centre (IDC) Manuals – Comprehensive Nuclear-Test-Ban Treaty (CTBT) documents
  – Status
  – Provisions and intended readership

• IMS Manuals – brief introduction (discussed in detail in previous presentations)

• IDC Manual: why is it of interest for States Parties (SPs)?
  – IDC tasks
  – Interactions among the components of the monitoring system
  – Requirements and how are met (provisional operations)
CTBT Documents

1. TREATY - CTBT

2. Manuals
   - IMS: Seismic, Hydroacoustic, Infrasound (SHI) and Radionuclide (RN)
   - IDC
   - On-Site Inspection (OSI)

3. Station specific documentation, regulations, rules, agreements, arrangements, operating procedures, etc.
Article IV, paragraph 1, of the Comprehensive Nuclear-Test-Ban Treaty requires that the verification regime, including the International Monitoring System element thereof, be capable of meeting the verification requirements of the Treaty at its entry into force.

Part I, paragraph 2, of the Protocol to the Treaty requires that the International Monitoring System stations “fulfil the technical and operational requirements specified in the relevant operational manual.”

Part I, paragraph 17, of the Protocol to the Treaty requires that the International Data Centre carry out its agreed functions in agreement with the procedures specified in the relevant operational manual.
Status

• Written as at entry into force
• Near final versions of the draft IMS / IDC Operational Manuals were prepared and translated into all UN official languages:
  • CTBT/WGB/TL-11,17/15/Rev.5 (December 2009)
  • CTBT/WGB/TL-11,17/16/Rev.5 (December 2009)
  • CTBT/WGB/TL-11,17/17/Rev.5 (December 2009)
  • CTBT/WGB/TL-11,17/18/Rev.5 (December 2010)
  • CTBT/WGB/TL-11,17/19/Rev.5 (August 2011)
• WGB / PTS continued work on the IMS / IDC manuals, on remaining technical issues.

• Results (reviewed texts) are collected in:
  
  • CTBT/WGB/TL-11,17/56 (November 2014)
  • CTBT/WGB/TL-11,17/57 (December 2014)
  • CTBT/WGB/TL-11,17/58 (December 2014)
  • CTBT/WGB/TL-11,17/59 (December 2014)
  • CTBT/WGB/TL-11,17/60 (December 2014)
IMS/IDC Manuals

• Include the technical and operational requirements needed to ensure the effective operation of these components of the monitoring and verification system.

• Present the interactions among these components, and the responsibilities of the entities that perform the O&M activities.
IMS Manuals – Provisions and Intended Readership

Stations “to fulfil their functions in the IMS”:
• Technical requirements: Ch. 3 and Appendix I and
• Operational requirements: Ch. 4, App. II, III (SHI)
• Maintenance and repairs: Ch. 5

IMS Manuals are intended primarily for the entities directly responsible for the operation and maintenance of a IMS station:
• Station Operators (SO)
• Technical Secretariat (TS) and its IDC
• National Data Centers (NDC)
The **Technical Secretariat (TS)** is responsible for the supervision and coordination of network operations and providing assistance as needed for the proper functioning of the stations.

As specified in his/her agreement, arrangement or contract, the **Station Operator (SO)** is responsible for station operation and maintenance and is the point of contact for the **TS**.

The coordination of operations between the **TS** and **SO** is done through a common reporting and messaging system.
IDC Manual – Provisions and Intended Readership

- IDC Operational Manual provides the necessary technical and operational detail required to ensure the effective operation of the International Data Centre.
- This manual is *intended for those engaged in daily operation of the International Data Centre, including technical personnel of all States Parties.*
The IDC is responsible for:

– IMS data collection, processing, analysing and archiving
– distribution of IMS data and IDC products under the verification regime.

Data and products obtained from the IDC are intended for independent use by States Parties.
IDC Manual TOC

• Chapter 1: Introduction
• Chapter 2: Overview of the IDC
• Chapter 3: Requirements and Responsibilities of the IDC
• Chapter 4: Specification of Communication Links, Data Processing, Products and Services
• Chapter 5: Supporting Services
• Appendix I: Waveform Event Definition Criteria
• Appendix II: Definition of Standard Event Screening Criteria
• Appendix III: List of Relevant Radionuclides and Particulate Spectrum Categorization
• Appendix IV: List of Relevant Radioxenon Isotopes and Noble Gas Spectrum Categorization
• Appendix V: Glossary
• Appendix VI: References
IDC Manual on IDC Products


• Requested or SP products resulted from expert technical analysis to improve standard products (Updated Event Bulletin, etc.)
IDC Manual on IDC Services to SPs

• IDC makes available IMS data and IDC products derived from them
• IDC monitors the operational status of the verification system: IMS network, Global Communications Infrastructure, IDC (software, hardware and data processing results)
• IDC responds to requests from SPs for technical assistance
• IDC provides support for national event screening
Collecting IMS Data

IDC monitors on IMS data

• availability

• timeliness

• quality and

• surety (authentication and tamper detection).
Data Availability / Timeliness

IMS station data availability computed by IDC checks for quality and surety

IMS station data timeliness is important for data being used in the IDC products
Data Availability (DA) and Timely Data Availability (TDA) for a group of auxiliary seismic stations
RN Particulate Downtime
Data Quality

SHI number of gaps

RN P Airflow
Using IMS Data

IDC monitors on IDC products

• availability
• timeliness
• quality
• distribution to SPs
SHI Standard Products

Number of Events in the SHI Products

Date

Count

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
0 50 100 150 200 250

GE11
GE12
GE13
MEB
CCTB
SHI Data Usage (Automatic Processing)
SHI Data Usage (Reviewed Processing)
SHI Analyst Review Results - 1

Summary of Interactive Analysis

Hydroacoustic Stations

Number of Phases

Unmodified
Modified
Added
SHI Analyst Review Results - 2

Phases not modified during interactive review

Percentage of Unmodified Phases

- October 2014
- November 2014
- December 2014
- January 2015
- February 2015
- March 2015
- April 2015
- May 2015
- June 2015
- July 2015
- August 2015

Date (month)

% Unmodified Phases

14
16
18
20
22

Average
RN Reviewed Results

Categorization Results of the Full Sample Spectra Review

Count

Radionuclide

Particulate

Noble Gas

- P - Level 1
- P - Level 2
- P - Level 3
- P - Level 4
- P - Level 5
- NG - Level A
- NG - Level B
- NG - Level C
- Not Categorized
IDC Verification Data Message System

VDMS response time for data requests
GCI Availability
Conclusions

**IMS/IDC Manuals are**

- documents required by the Comprehensive Nuclear-Test-Ban Treaty
- high level documents that govern the functioning of all stations in the IMS network and of the IDC
- intended for those engaged in daily operation of IMS stations/laboratories, NDCs, IDC.