

Association of Radio Industries and Businesses

**ARIB**

# Activities of ARIB after the last Meeting

**- Standardization for Radio Systems -**

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Secretary General, Senior Managing Director

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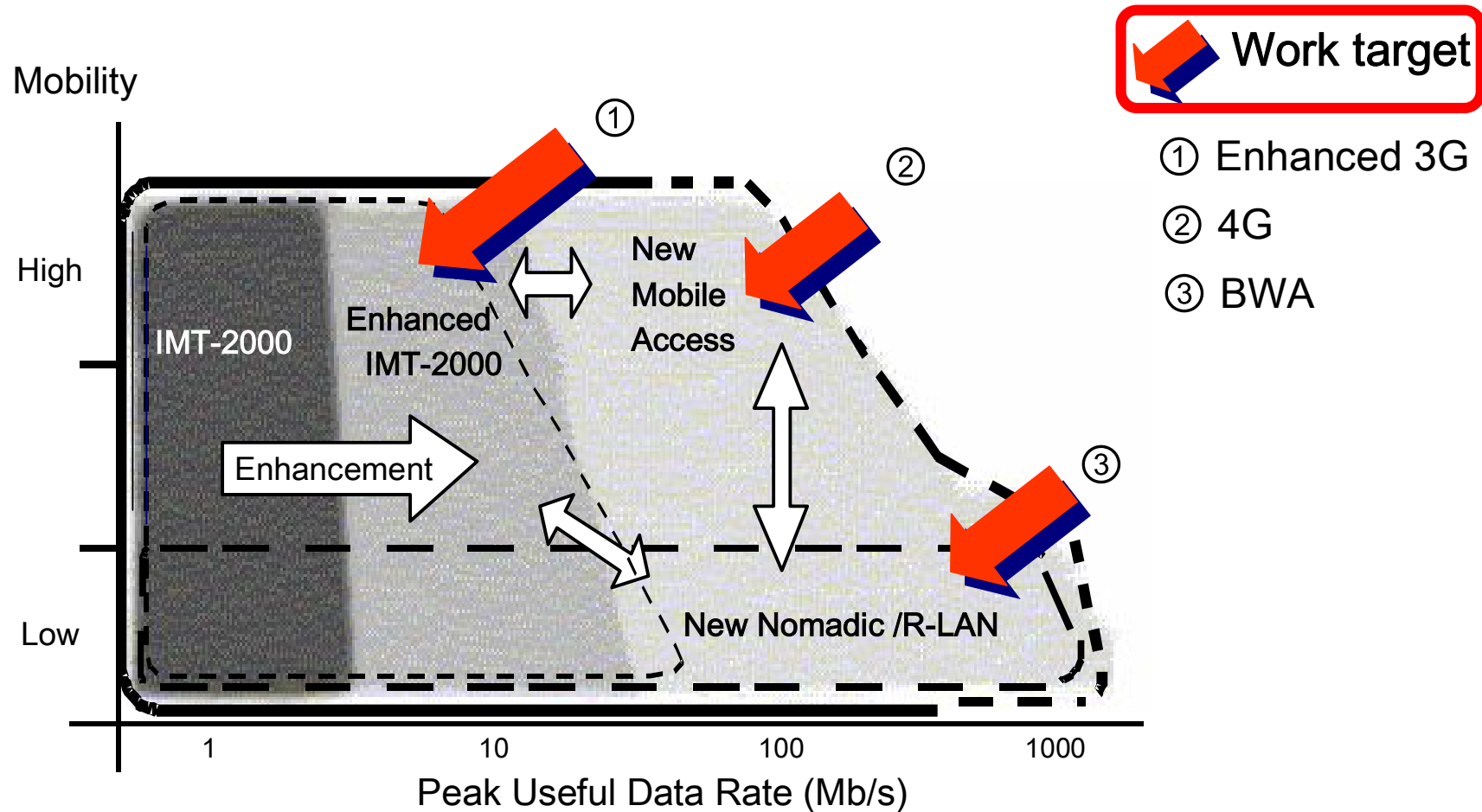
- **Major R&D and Standardization Updates**
  - **Activities in Advanced Wireless Communications**
  - **Digital Broadcast systems in Japan**
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# Major R&D and Standardization Updates

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## Activities in Advanced Wireless Communications

## Advanced Wireless communications



Note: The illustration is based on Fig. 2 of ITU-R Rec. M.1645

# Advanced Wireless Communications Study Committee (ADWICS)

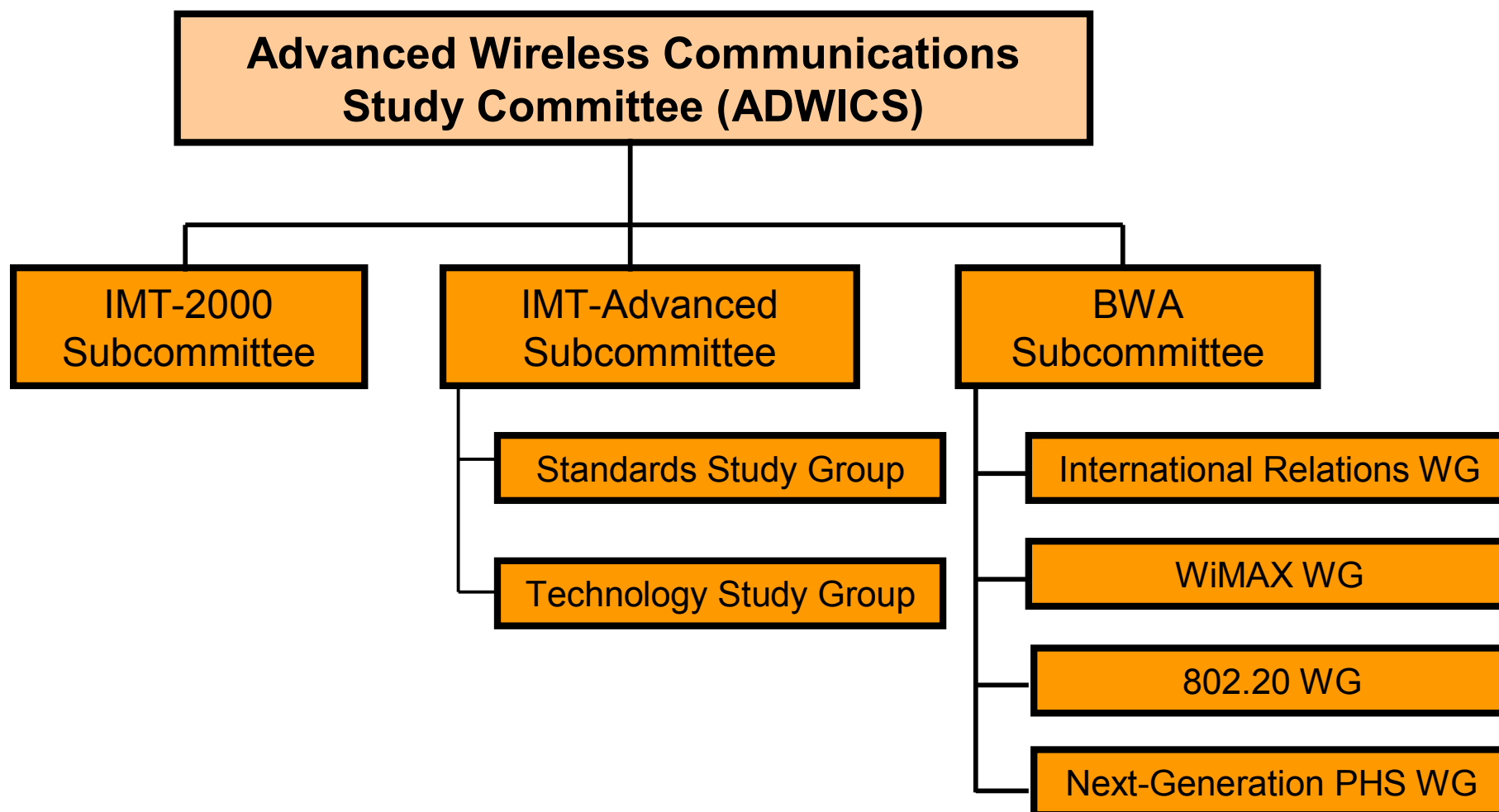
## ■ Establishment

- April, 2006

## ■ Scope of Work

- To conduct technical studies on Advanced Wireless Communications Systems: IMT-2000, IMT-Advanced and Broadband Wireless Access (BWA)
- To contribute to the global standardization

# Organization of ADWICS



## IMT-2000 Subcommittee

- Continuous updates in-sync with 3GPPs
- Inclusion of TDD-CDMA to ARIB STD-T63

## IMT-Advanced Subcommittee

- Contributions to ITU-R SG8
- Technical Studies are ongoing

# BWA Subcommittee

- Scope of Work
  - To study technologies on BWA systems to be operated in the 2.5 GHz band and to standardize their technical specifications as ARIB Standards
- Technologies under Study
  - Mobile WiMAX (based on IEEE 802.16-2004 Standard amended by 802.16e-2005)
  - MBTDD-Wideband (based on IEEE 802.20 Draft)
  - MBTDD-625k MC (based on IEEE 802.20 Draft)
  - Next-Generation PHS (based on PHS MoU Group Draft)

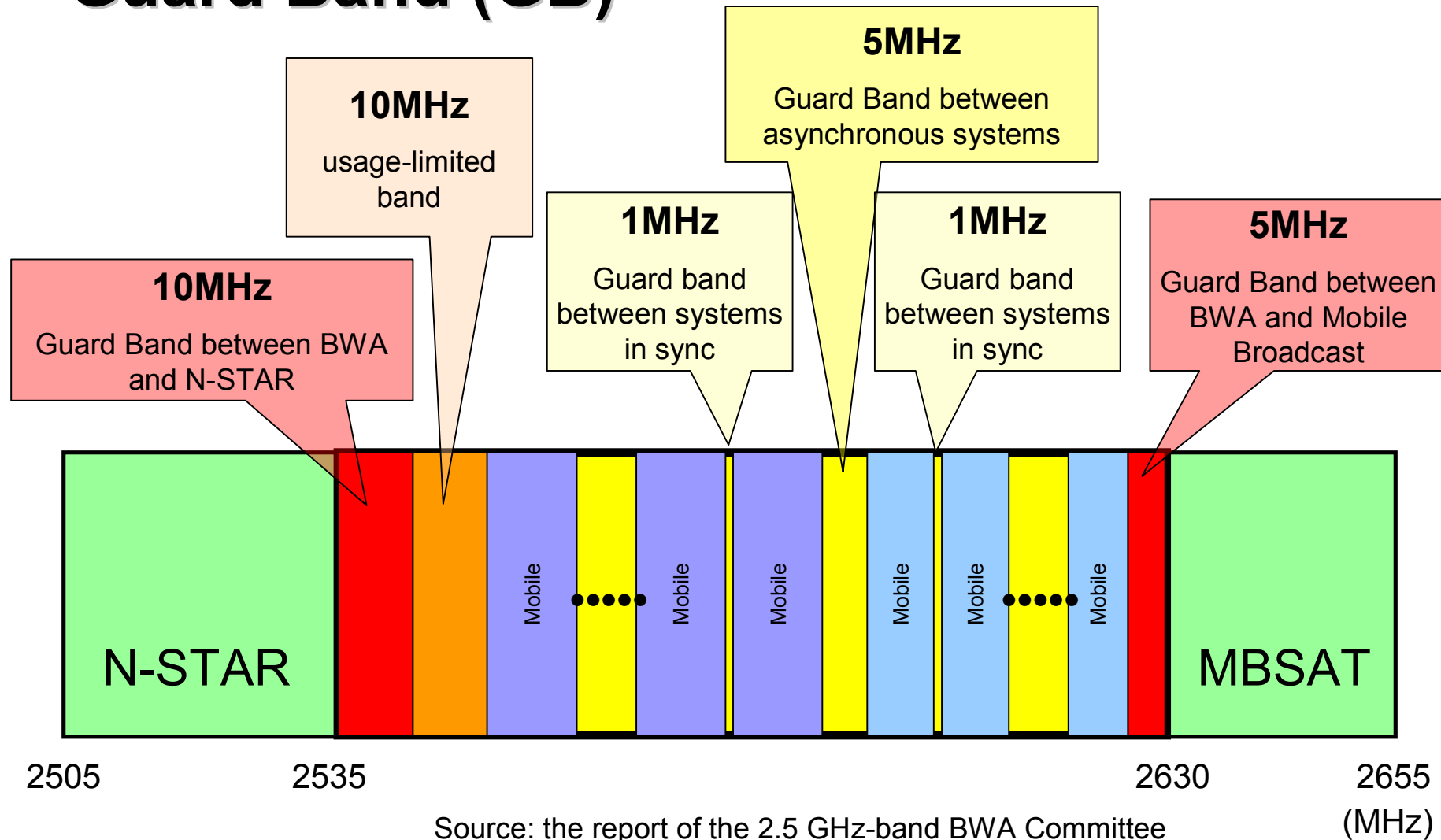
# BWA Subcommittee

- International Relations WG
  - Established in June 2006 under BWA Subcommittee
  - Building liaison relationship with WiMAX Forum, IEEE 802.16WG, IEEE 802.20WG and PHS MoU Group
  
- WiMAX/802.20/Next-Generation PHS WGs
  - Each established in March 2007 under BWA subcommittee
  - Works have been just initiated
  - First drafting of ARIB standards for BWA systems is underway, targeting timeframe of July/August 2007.

# Moves in the government sector

- December 2006, the Information and Communications Council approved and presented the report of the 2.5 GHz-band BWA Committee to the Minister of Internal Affairs and Communications
- MIC (the Ministry of Internal Affairs and Communications) is now preparing relevant regulations and a licensing policy
- There are four systems described in the committee report:
  - Mobile WiMAX, 802.20 (MBTDD-Wideband, MBTDD-625k MC), and Next-Generation PHS

# 2.5 GHz-band Regulatory Issue: Guard Band (GB)



# Timeline for 2.5 GHz-band BWA System Operation

- Q1 2007 – MIC to issue draft technical requirements including spectrum allocation plan (to be finalized in Q2)
- Q2 2007 – MIC to issue “call for operators” (beauty contest basis)
- Q3 2007 – MIC to license operators

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# Major R&D and Standardization Updates -2-

## **Digital Broadcast systems in Japan**

# Digital Broadcast Systems

## ■ Media

- Digital Terrestrial Television
- Broadcast Satellite (BS)/Communication Satellite (CS) Digital Television
- Digital Terrestrial Audio Broadcasting
- 2.6GHz Satellite Digital Audio Broadcasting
- Digital Cable Television (defined and maintained by JCTEA)

## ■ ARIB Standards and Technical References

- Overview is shown on next slide
- TR contains important information for implementation
- Download: <http://www.dibeg.org/>

# Digital Broadcasting Standards of ARIB

	Digital Television		Digital Sound	
	BS / wCS	Terrestrial	Terrestrial	Satellite
System	STD-B20	STD-B31	STD-B29	STD-B41
Multiplex	Coding & Multiplexing		STD-B32	
	Service Information		STD-B10	
Source coding	Coding & Multiplexing		STD-B32	
Data Broadcasting	Presentation Engine (BML)		STD-B24	
	Execution Engine (GEM-based)		STD-B23	
CAS	Conditional Access		STD-B25	
Home servers	System based on Home Servers		STD-B38	
Receivers	STD-B21		STD-B30	STD-B42
Operational Guidelines	TR-B15	TR-B14	TR-B13	TR-B26
TR for the System based on Home Servers	TR-B27		N/A	

# Major R&D and Standardization Updates

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## Other Standards

# Other Standards -1-

- **Personal Handyphone Systems (PHS)**

- Revised RCR STD-28 for enhancement
- More than 100 Million subscribers worldwide
- Focus on the Next Generation PHS

- **RFID**

- **New STD ARIB STD-T92**  
433MHz-Band Data Transmission  
Equipment for International Logistics

## Other Standards -2-

- **UWB**

- New STD **ARIB STD-T91**  
UWB (Ultra-WideBand) Radio System  
(for 3.4GHz - 4.8GHz and 7.25GHz - 10.25GHz)

- **Wireless LAN**

- Expansion of 5GHz band to include 5.47 – 5.725GHz (5.6GHz band) is expected to be adopted in May
- 802.11n equivalent capabilities will be added in near future

# 5GHz band Wireless LAN

Frequency	5.15~5.25 (GHz)	5.25~5.35 (GHz)	5.47~5.725 (GHz)
After WRC-03	In service (Indoor)	In service (Indoor)*1	Will be Available*2 (Indoor/ Outdoor)
	ARIB STD-T71		(revision work is completing )
Before WRC-03	In service (Indoor)	No service	No service

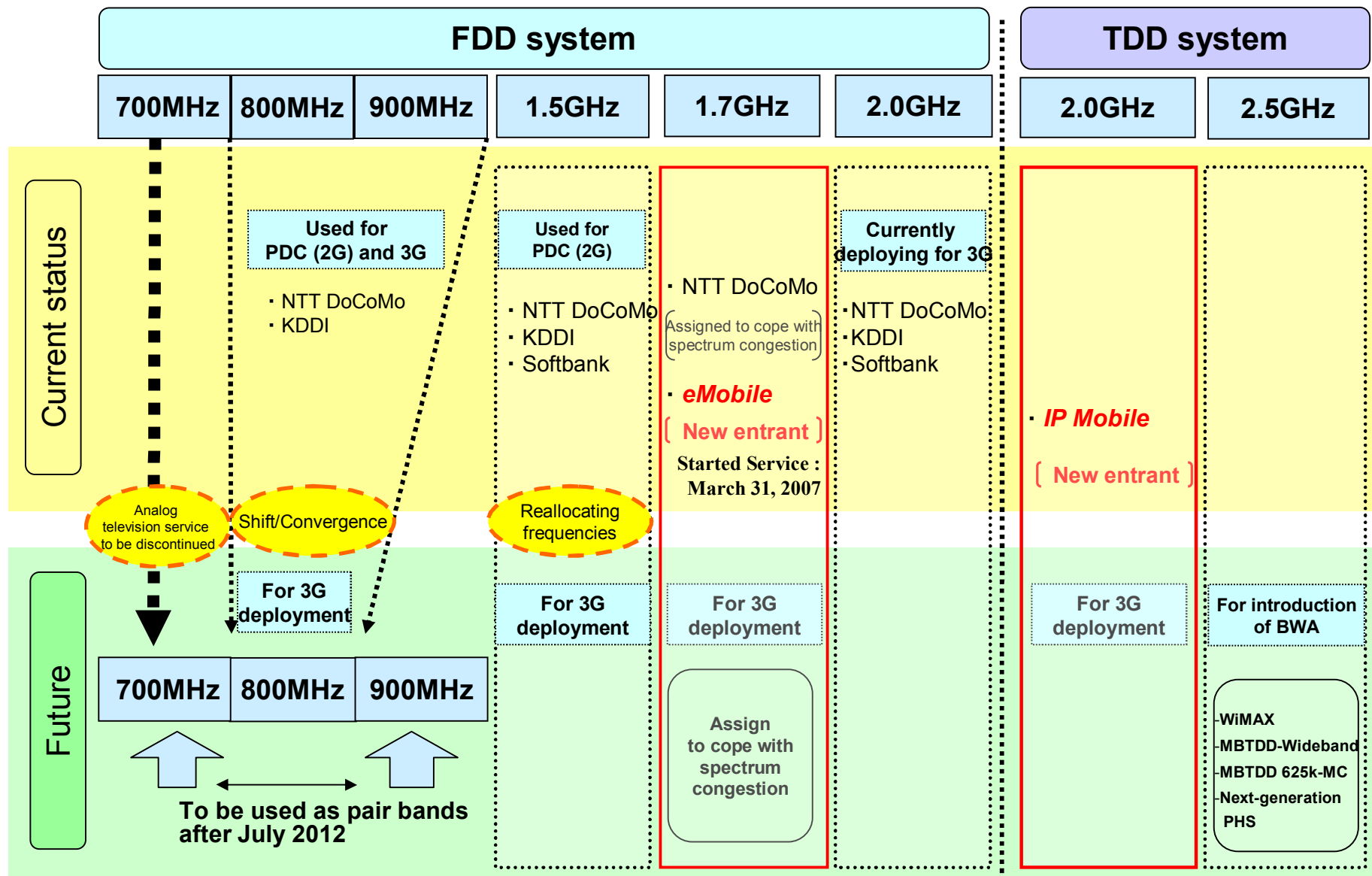
\*1 ARIB STD-T71 Broadband Mobile Access Communication System (CSMA) (3.0; September 2005)

\*2 ARIB STD-T71 Broadband Mobile Access Communication System (CSMA) ((3.3;) May 2007)

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# Current status of Spectrum Re-allocation Action Plan

# Frequency Allocation and Licences for 3G and BWA



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Thanks for your attention!

Association of Radio Industries and Businesses

**ARIB**

# Activities of ARIB

- Standardization for Radio Systems -

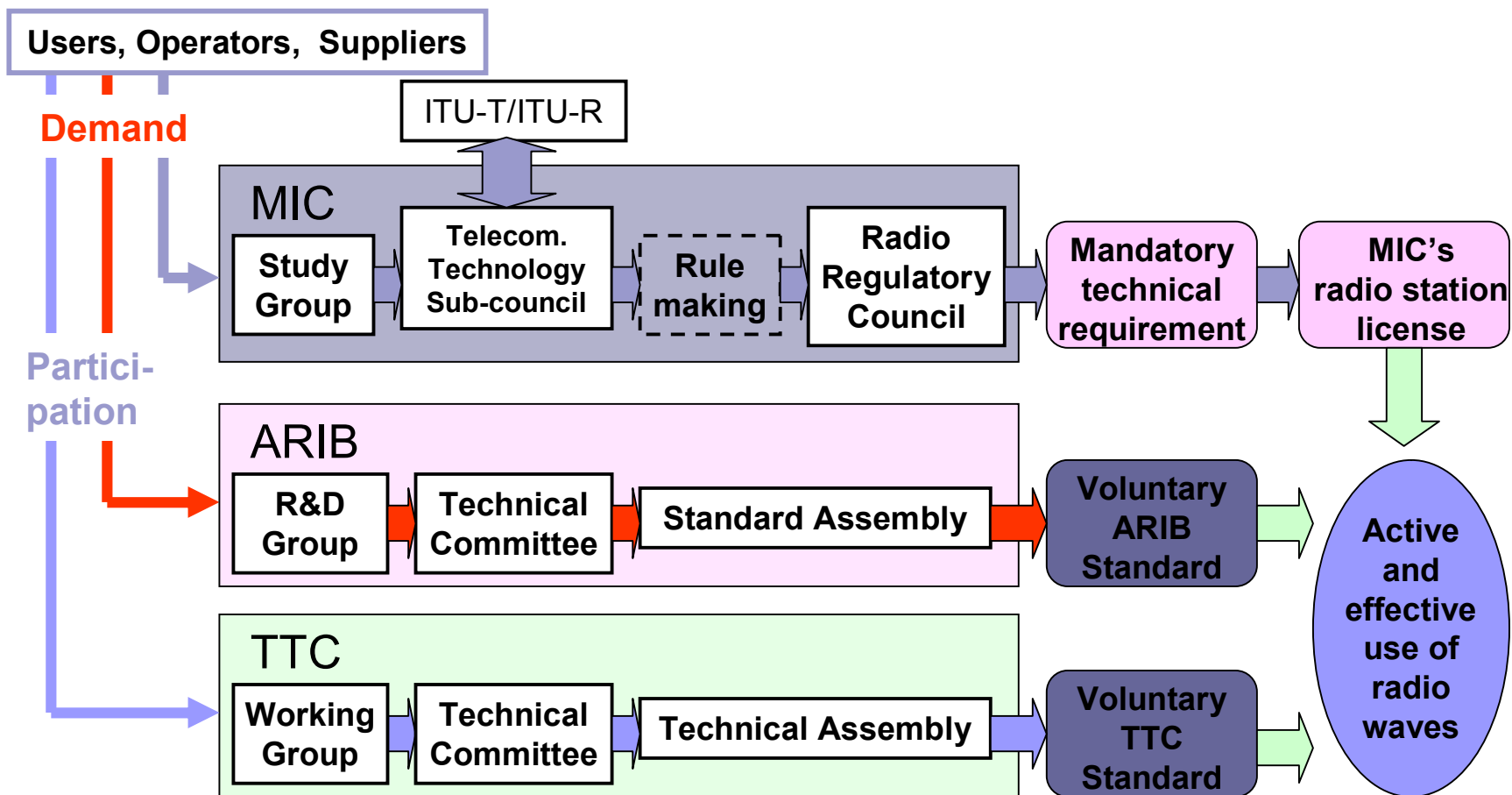
# CONTENTS

- **Standardization Flow in Japan**
- **About ARIB**
- **R & D and Standardization**

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# Standardization Flow in Japan

## Standardization Flow in Japan



(Note) MIC: Ministry of Internal Affairs and Telecommunications  
(previously known as MPHPT)

# Government Regulations and ARIB Standards for radio systems

	Government Regulations	ARIB Standards
Nature	Mandatory	Voluntary
Purpose	<ul style="list-style-type: none"> <li>◆ To promote efficient use of frequency</li> <li>◆ To prevent interference occurring</li> <li>◆ etc.</li> </ul>	<ul style="list-style-type: none"> <li>◆ To ensure common air interface</li> <li>◆ To ensure suitable quality</li> <li>◆ etc.</li> </ul>
Technical items	<ul style="list-style-type: none"> <li>◆ Frequency band</li> <li>◆ Spurious emission</li> <li>◆ Frequency tolerance</li> <li>◆ Occupied bandwidth</li> <li>◆ etc.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Communication protocol</li> <li>◆ Sensitivity</li> <li>◆ Carrier to Noise ratio</li> <li>◆ Bit error rate</li> <li>◆ Measurement method</li> <li>◆ etc.</li> </ul>

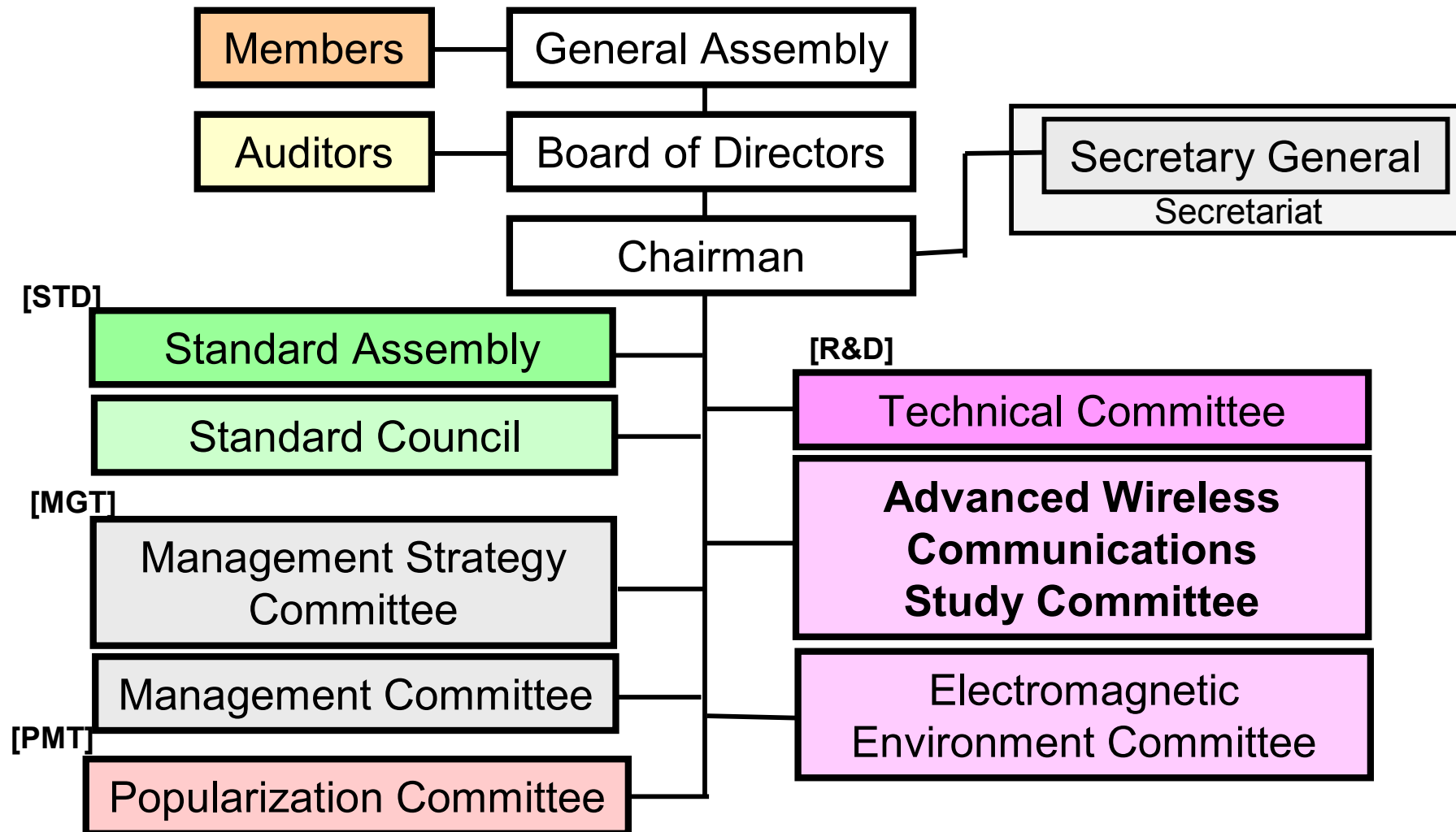
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# About ARIB

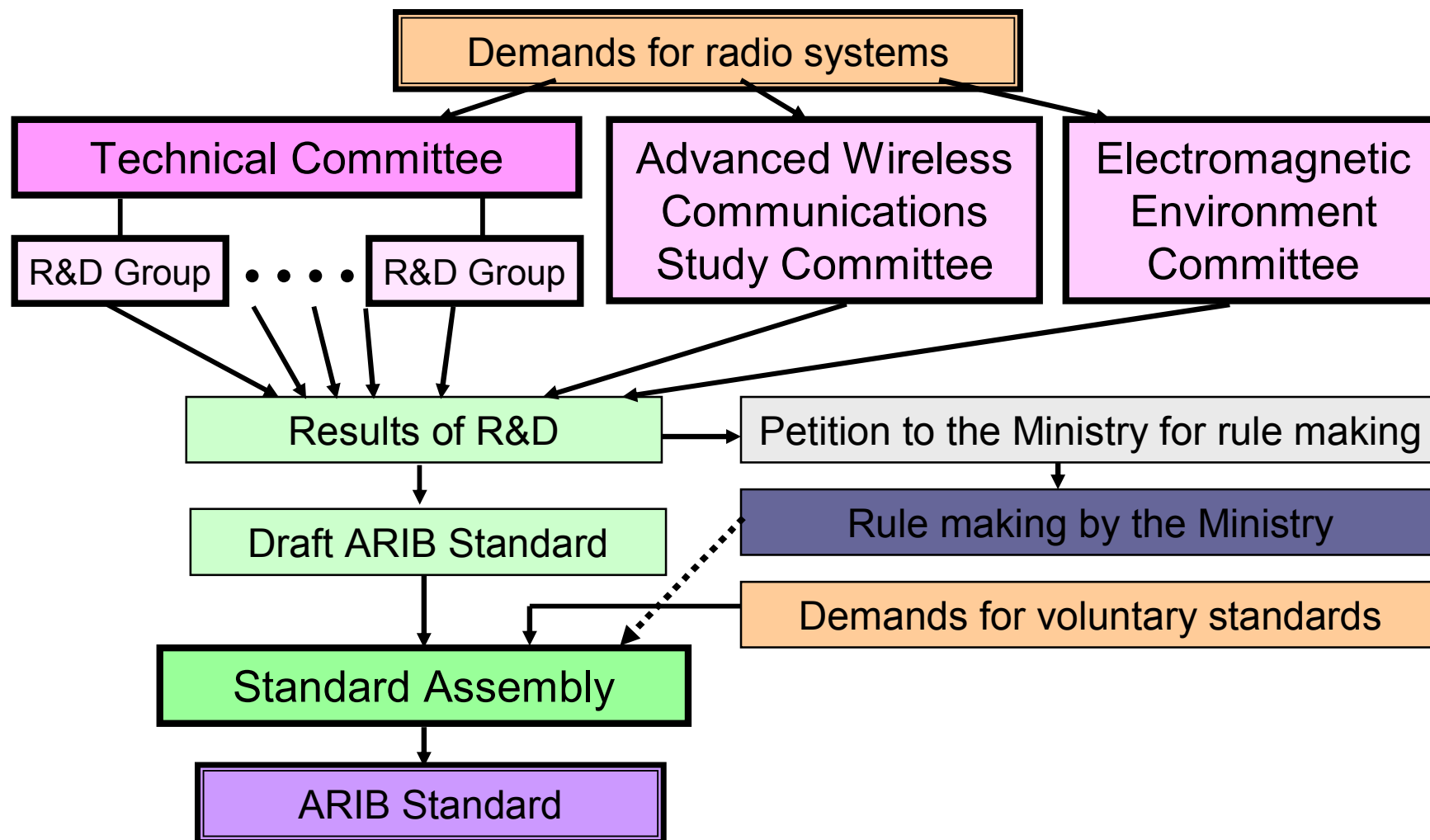
# Outline of ARIB

- **Establishment:** merge of two organizations in 1995:
  - Research & Development Center for Radio Systems (RCR)
  - Broadcasting Technology Association (BTA)
- **Objective:** promotion of public welfare by means of:
  - conducting investigation, R&D and consultation of utilization of radio waves
  - promoting realization and dissemination of new radio systems
- **Main Activities:**
  - investigation and R&D on utilization of radio waves
  - establishment of voluntary technical standards for radio systems
  - consultation, dissemination, collection and publication of information on utilization of radio waves
  - frequency change support for terrestrial digital TV broadcasting
  - frequency expiration support for re-allotment of radio spectrum

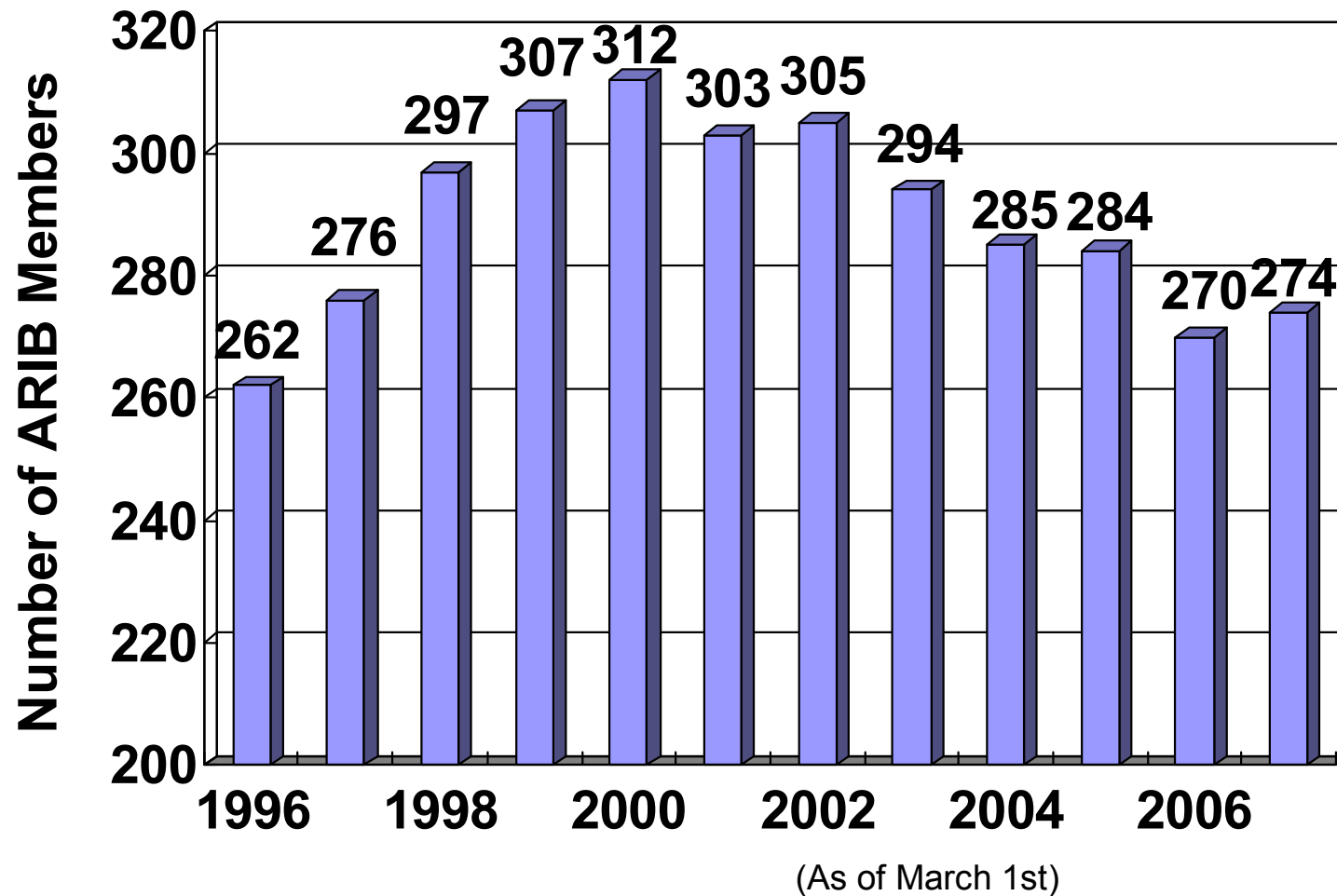
# Organization of ARIB



# ARIB's R&D and Standardization

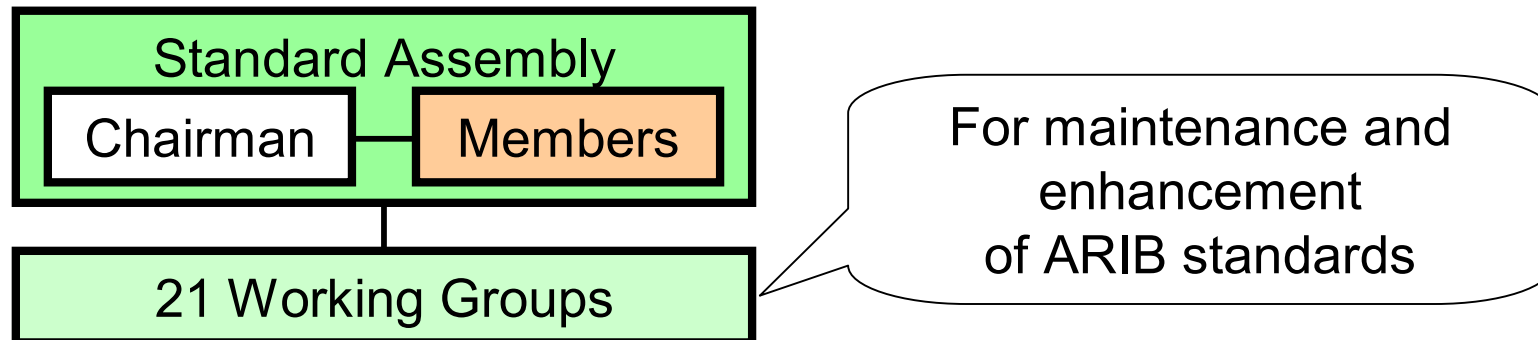


# Evolution of ARIB membership



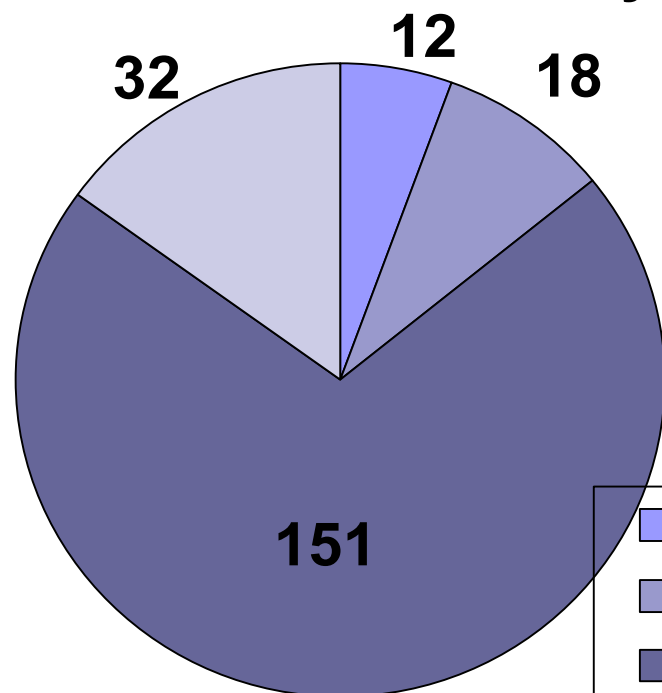
# ARIB Standard Assembly

- **Establishment: 1995**  
(reorganized from the RCR Standard Assembly and the BTA)
- **Members: 213** (as of March 1, 2007)
  - open to any entity, organization and person
  - no limitation on nationality
  - independent from ARIB membership
- **Organization:**



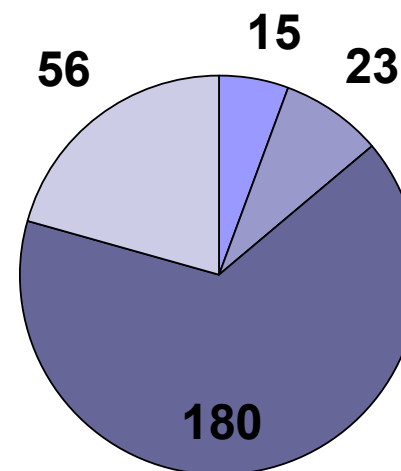
# Members of ARIB Standard Assembly

**Members of ARIB Standard Assembly**

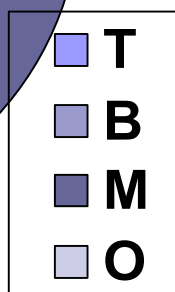


Total: 213

**Ref.: ARIB Members**



Total: 274



T: Telecommunications companies  
 B: Broadcasting companies and organizations  
 M: Research, Development and manufacture companies of radio equipment  
 O: Wholesaler, bank, electricity, gas and service companies and corporations  
 (as of March 1, 2007)

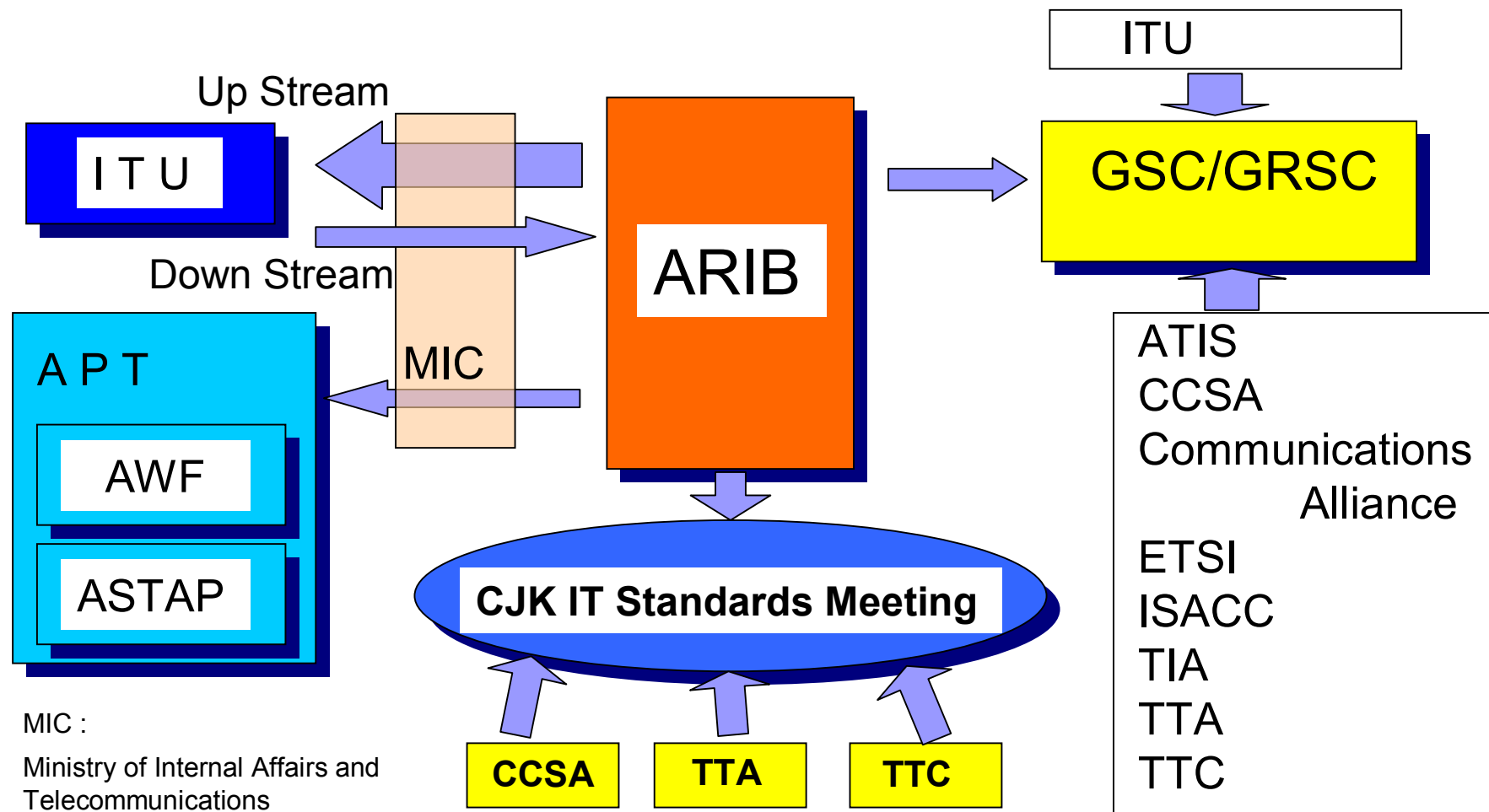
# Outcome from Standard Assembly

- **ARIB Standards (STDs):**
  - voluntary standards of private sector
- **ARIB Technical Reports (TRs):**
  - technical information not including standards
- **Number of STDs and TRs**

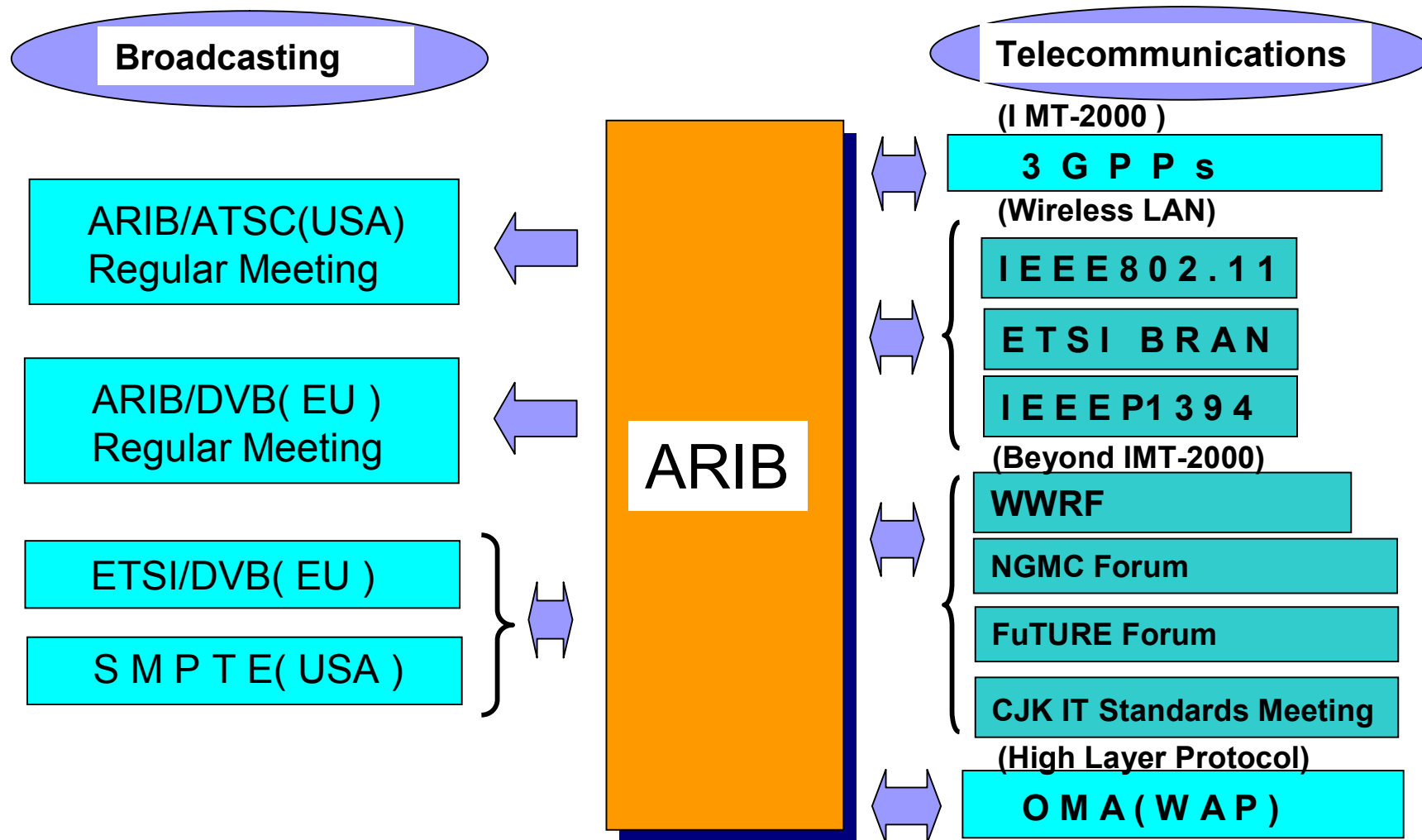
	STD	TR
Telecommunications	75(73)	19(19)
Broadcasting	50(50)	39(37)
General	0(0)	1(0)

As of March 31 2007 (March, 2006)

## Standards Collaboration (General)



## R&D / Standards Collaboration (Specific Projects)



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# R & D and Standardization

# Standardization Updates -1-

## Public Telecommunications

- **IMT-2000 & IMT-Advanced**

- Active participation in the work of ITU-R, 3GPPs, APG, Mobile IT Forum (mITF), etc.
- STDs and TRs (including English version) for DS-CDMA and MC-CDMA systems are continuously revised.
- For STD-T63, changes in 3GPP specs up to December 2006 (3GPP TSG#34) were transposed. In addition, **TDD-CDMA** (3.84Mcps) is included since September 2006.
- For STD-T64, changes in 3GPP2 specs up to September 2006 were transposed. Maintenance of HRPD (EV-DO) feature is ongoing.

# Standardization Updates -2-

## Public Telecommunications

- **Personal Handyphone System**

- RCR STD-28 was revised to add 64QAM and 256QAM for higher data transmission rate along with other enhancements.

## Low Power Radio Communications

- **RFID**

- New STD-T92 was adopted for 433MHz band active tag system for the purpose of international cargo distribution/transportation.

# Standardization Updates -3-

## Low Power Radio Communications

### ■ Wireless LAN

- Work will complete in May 2007 to add 5.47~5.725 GHz for both indoor and outdoor use into 5GHz band. (802.11a equivalent) to upgrade ARIB STD-T71
- Other work is ongoing to include IEEE 802.11n equivalent. Expected to complete in summer 2007.

### ■ UWB

- New ARIB STD-T91 was adopted to allow implementation of UWB system in 3.4GHz~4.8GHz and 7.25GHz~10.25GHz.

# Standardization Updates -4-

## Broadcasting

### ■ Revised STDs for Digital Broadcasting

- (STD-B10) Service Information for Digital Broadcasting System
- (STD-B24) Data Coding and Transmission Specification for Digital Broadcasting
- (STD-B25) Conditional Access System Specifications for Digital Broadcasting
- (STD-B32) Video Coding, Audio Coding and Multiplexing Specifications
- (STD-B1) Digital Receiver For Digital Satellite Broadcasting Services Using Communication Satellites
- (STD-B21) Receiver for Digital Broadcasting (Desirable Specifications)
- (STD-B30) Receiver For Digital Terrestrial Sound Broadcasting (Desirable Specifications)

## Broadcasting

### ■ New TRs for Broadcasting

- (TR-B27) Digital Broadcasting System based on Home Server
- (TR-B28) User requirements for a flat panel display as Master Monitor in an HDTV program production environment

### ■ Revised TRs for Digital Broadcasting

- (TR-B13) Operational Guidelines for Digital Terrestrial Sound Broadcasting
- (TR-B14) Operational Guidelines for Digital Terrestrial Television Broadcasting
- (TR-B15) Operational Guidelines for Digital Satellite Broadcasting

# Standardization Updates -6-

## General

- New TR in general radio technology
  - (TR-G1) Measurement Method of Electric Field Strength from Low Power Communications Equipments used in Test Facilities such as Anechoic Chamber, etc.