SET eXPerience 2021

Response to TV 3.0 Project CfP Phase-1 and 2 Overview explanation

DiBEG/Japan

DiBEG Proposal to CfP

DiBEG
Digital Broadcasting Experts Group

1. General

DiBEG, Digital Broadcasting Experts Group, submitted the technical documents of Ph-1 and Ph-2 in response to the Call for Proposal by the SBTVD Forum of Brazil. We proposed the Advanced ISDB-T system which includes the whole layers of physical layer, transport layer, video coding, audio coding, captions and application coding for both Ph-1 and Ph-2. This document describes the overview of our proposal for each layer.

Especially as for the physical layer, we prepared the transmission products of the Advanced ISDB-T system. We conducts laboratory tests and field tests in Brazil.

As for the video coding, we are considering to adopt the VVC coding for the Japanese next-generation DTTB (Advanced ISDB-T); and we submitted a proposal to SBTVD-F using this VVC technology jointly with InterDigital, Ateme and Fraunhofer.

As for the audio coding, we are considering the MPEG-H 3D audio coding for the Advanced ISDB-T; and we submitted a proposal using this MPEG-H 3DA technology jointly with Fraunhofer, Ateme and ATSC.

Proposal to CfP by DiBEG

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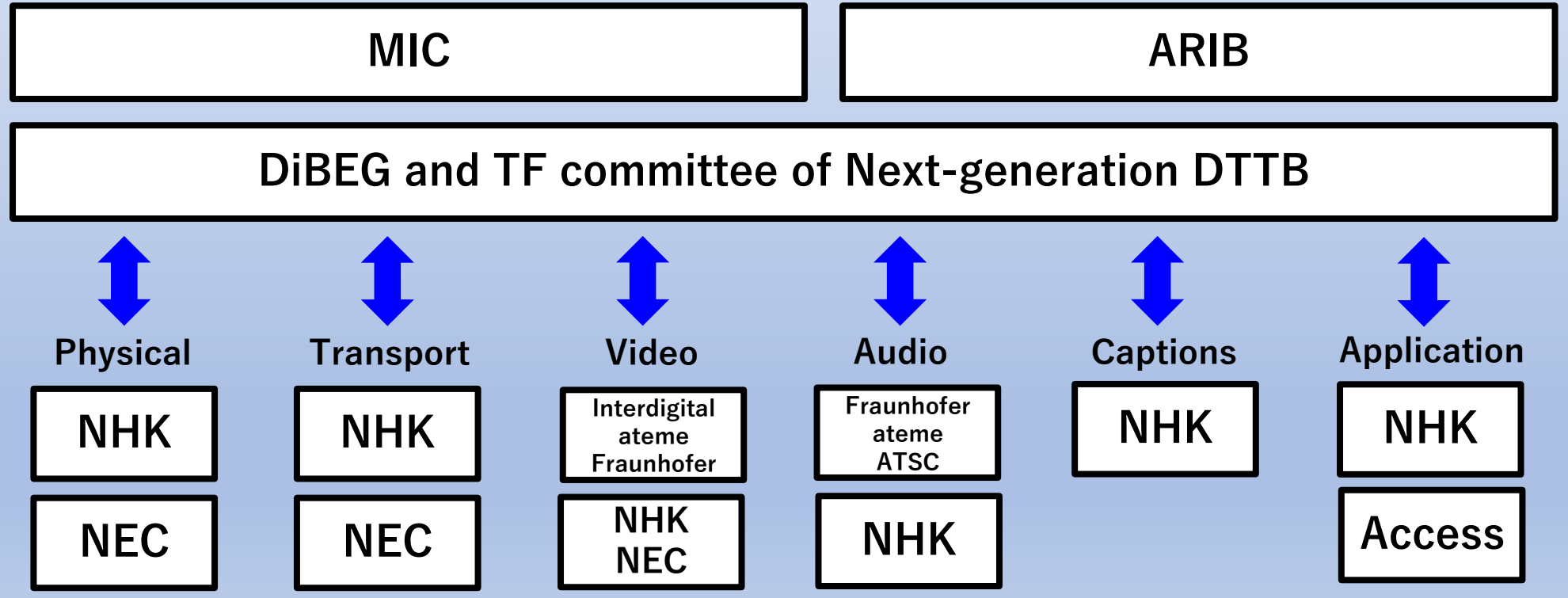
2. Organization chart for the proposal to CfP

Our organization chart for the technical proposal is shown below. MIC, ARIB, DiBEG and TF committee are the main counterparts to SBTVD-F. NHK and Japanese manufacturers support detailed technical issues and studies on the CfP.



About Advanced ISDB-T

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1. Outline of the Advanced ISDB-T Technologies

DiBEG have proposed the Advanced ISDB-T. Countries that adopted ISDB-T, such as Japan and Brazil, have continued efforts to improve digital broadcasting services by enhancing the capabilities of the ISDB-T. The Advanced ISDB-T is a next leap of ISDB-T to offer far beyond the existing services, such as provision of UltraHD-based services in both broadcast and Integrated Broadcast-Broadband.

The Advanced ISDB-T is based on the candidate technologies for the next-generation DTTB standard in Japan which is expected to be standardized around 2023.

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2.1 Strengths of the Technology

There are many strengths in the Advanced ISDB-T. The most important feature of the Advanced ISDB-T is the capability of various and flexible services with high efficiency. A single system with the state-of-the-art technologies offers and efficiently handles a wide variety of services from simple yet important ones such as Emergency Warnings to rich and complex ones such as Interactive UltraHD Streaming linked to Social Network Services. IP and HTML5 application environments greatly contribute to providing flexibility and efficiency to the Advanced ISDB-T.

In addition, technologies used in the physical part of the Advanced ISDB-T are practical and proven. For example, regarding the over-the-air 2x2 MIMO transmission, which is one of the basic requirements of TV 3.0, the Advanced ISDB-T has lots of successful experiences including field tests by using actual equipment (see Report ITU-R BT.2343).

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2.2 Strengths of the Technology

While the Advanced ISDB-T targets UltraHD transmission, it can also be applied to HD over-the-air transmission of TV 3.0. The Advanced ISDB-T incorporates such newest and flexible technologies of various fields for the other layers as well.

In that sense, even though some of the requirements of TV3.0 and the next-generation DTTB of Japan are different from one another, the Advanced ISDB-T can satisfy both requirements with high flexibility.

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3.1 Benefits of the Technologies

In every service by the Advanced ISDB-T, each broadcaster can choose and build its own structure of services in a cost-efficient manner. For example, provision of UltraHD video service can be achieved over the broadcast channel that is the most efficient way to deliver such service to the large number of TV viewers simultaneously, because the UltraHD streaming can be incorporated into the channel to offer additional video services, or can be used to deliver services to a specific area where building a broadcast network is not economically feasible.

Besides, the Advanced ISDB-T employs cutting-edge technologies some of which have been proven for broadcast purposes through experiences of Japanese broadcasters in a recent couple of years. Thus, the technologies are comfortably reliable, which is also an important factor for the broadcasters in Brazil.

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3.2 Benefit of the Technologies

In addition, some the technologies proposed in the Advanced ISDB-T are based on the globally used technologies that can be found in the application coding aspect, in particular. It will lead to high performance, cost effective, and a wide variety of receiver terminals. Such characteristics of receiver terminals will be beneficial to both the industries and the public.

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4. Schedule of Advanced ISDB-T

It should also be mentioned again that DiBEG's proposals are based on candidate technologies for the next-generation DTTB in Japan. As seen in the great success of ISDB-T, it is needless to say that the maximized commonality between these two countries will bring the benefits of industrial scale to all the stakeholders, broadcasters, related industries, and the public.
The implementation schedule of the next generation DTTB is shown below.

Description	2021	2022	2023	2024
Plan in Brazil for the Next Generation	CfP Field Tests (MIMO)	Standard formulation	Start of TV 3.0	
Plan in Japan for the Next Generation	Study and Test for Next Generation - Study of comparison of 3 standards - Study of Video and Audio Coding Technology - Study of Datacasting, Subtitle and EWBS - Study of Migration Plan			Forecast of Next Generation

Outline of Proposal

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The outline of the technical proposal for each layer for Ph-2 is shown below.

No.	Subject	Technical Proposal	Remarks
1.	**Physical layer**	**Proposed System** - Advanced ISDB-T system **Plan of this System** - Japanese Next-generation DTTB **Submitted Document (2nd July)** - Specifications of Advanced ISDB-T physical layer - Factory test data in Japan **Provision of the Equipment** - Transmission system of Advanced ISDB-T - Reception system of Advanced ISDB-T - Measuring equipment for Advanced ISDB-T - MIMO reception antenna system **Technical support** - Laboratory and Field tests in Brazil	SISO/MIMO

Outline of Proposal

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The outline of the technical proposal for each layer for Ph-2 is shown below.

No.	Subject	Technical Proposal	Remarks
2.	**Transport layer**	**Proposed System** - MMT system **Current Operating System** - CS and BS 4K/8K Broadcasting in Japan **Submitted Document (2nd July)** - ARIB STD-B60 version 1.13 - Overview of DiBEG MMT technology **Provision of the Equipment** - Included in Physical Layer Equipment **Technical support** - Laboratory and Field tests in Brazil	

Outline of Proposal

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The outline of the technical proposal for each layer for Ph-2 is shown below.

No.	Subject	Technical Proposal	Remarks
3.	**Video Coding**	**Proposed System** - VVC coding **Plan of this System** - Japanese Next-generation DTTB **Submitted Document** - Video test contents of 2K, 4K and 8K programs - Further technical report (planned) **Joint proposal with** - InterDigital, Ateme and Fraunhofer **Provision of the Equipment** - Provided by InterDigital **Technical support** - Laboratory and Field tests in Brazil	

Outline of Proposal

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The outline of the technical proposal for each layer for Ph-2 is shown below.

No.	Subject	Technical Proposal	Remarks
4.	**Audio Coding**	**Proposed System** - MPEG-H 3D audio coding **Plan of this System** - Japanese Next-generation DTTB **Submitted Document** - Audio test contents - Further technical report (plan) **Joint proposal with** - Fraunhofer, Ateme and ATSC **Provision of the Equipment** - Provided by Fraunhofer **Technical support** - Laboratory and Field tests in Brazil	

Outline of Proposal

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The outline of the technical proposal for each layer for Ph-2 is shown below.

No.	Subject	Technical Proposal	Remarks
5.	**Captions**	**Proposed System** - ARIB-TTML caption **Current Operating System** - CS and BS 4K/8K Broadcasting in Japan **Submitted Document (2nd July)** - ARIB STD-B62 version 2.2-E1 - Overview of ARIB-TTML Caption	
6.	**Application**	**Proposed System** - HTML5 base with Giga architecture **Current Operating System** - Based on CS and BS Broadcasting in Japan **Submitted Document (2nd July)** - Informative Document for Datacasting - ARIB STD information	

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Muito obrigado!

ARIB / DiBEG extend technical cooperation to Brazil in establishing a Next-generation Broadcasting Standard!

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ASSOCIATION OF RADIO INDUSTRIES AND BUSINESSES

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