

# Technical Assistance with the Introduction of Terrestrial Digital Television in Costa Rica

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## 1. Introduction

The Republic of Costa Rica is a country in Central America with a population of 4.5 million and a land area equivalent to the islands of Shikoku and Kyushu combined. Its capital city is San José and, like Japan, it is a demilitarized country with no armed forces. 97% of Costa Rican households have televisions, and the country has about 40 terrestrial television stations. Between March

■ **Photo 1: Visiting the Irazú transmitter station**



2012 and September 2014, I was dispatched to Costa Rica as a JICA specialist to assist with the introduction of the ISDB-T terrestrial digital broadcast system that was developed in Japan. This article describes what I got up to during my two-and-a-half year stay in Costa Rica.

## 2. Assigned organization and purpose of visit

Discussions on the introduction of digital television in Costa Rica started when it was listed as one of the public policy objectives in the country's National Communication Development Plan for 2009–2014. This was followed by comparative tests of the three broadcast systems recommended by ITU-R at the time (ISDB-T, DVB and ATSC), and in May 2010 ISDB-T was officially selected. I was appointed to the project about two years later in March 2012. By this time, preparations for starting the process of migration to digital television were already under way. I was assigned to the Ministry of Science, Technology and Telecommunications (MICITT), where I was provided with an office as a base for my work. In my capacity

■ **Photo 2: My office at the MICITT in San José**



as a support advisor on the transition to terrestrial digital television broadcasting, my aim was to provide technical support for a smooth transition to digital broadcasting by supporting the policy-related aspects of this initiative.

## 3. Technical cooperation with the MICITT

The MICITT is playing a central role in the transition to digital broadcasting, and is one of the driving forces behind technical cooperation related to institutional facilities. Like in Japan, the planning of digital channels was a major issue in Costa Rica, so I spent a lot of time assisting in this regard. To avoid spending too much time on ad hoc discussions and explanations, I summarized each item in the form of a technical report on which subsequent discussions and explanations could be based. These reports were used in internal discussions at the MICITT, and were also reflected in local laws, regulations and internal ministerial documents, and were used in materials for meetings with other organizations.

### • Circuit design and planning criteria

I introduced data such as the circuit design concepts presented in ITU-R BT.1368, the basis of calculations used to obtain planning reference values in Japan and Brazil (required field strength and interference margins), and the reference values of other countries that have already adopted ISDB-T, such as Peru and Ecuador.

### • SFN feasibility study

In Costa Rica, I studied the feasibility of using a single frequency network (SFN) to make effective use of frequency by covering the entire country with a single channel. Using an electric field simulation, I studied the possibility of introducing an SFN in the transmitter stations at 8 typical locations, and I reported the results to a joint committee comprising government agencies and other organizations such as broadcasters.

### • Technical evaluation of the draft channel plan

I performed a technical evaluation of a draft channel plan compiled by the MICITT. After performing a computer simulation to analyze the electric field strength, we discussed the possibility of interference of analog broadcasts, and proposed the importance of a graduated increase in power and interference studies when starting digital broadcasting.

### • Other

I studied the possibility of interference with neighboring countries, conducted a technical evaluation of draft revisions to the national frequency plan, studied interference between DTV and IMT, and supported other activities including the preparation of a draft inspection manual for use at the start of broadcasting, the allocation of Network IDs and Service IDs, and the use of gap filler technology.

#### 4. Commencement of digital services by the state-owned broadcaster

A systematic review of digital licenses was also carried out, causing long delays in the start of procedures to issue digital licenses to businesses. Under these circumstances, the state-owned broadcaster's digital channels were individually specified in advance, and a technical evaluation was performed in which multiple channel proposals were presented by the MICITT. The results of this investigation were reflected in a policy document defining the digital channels of the state-owned broadcaster. This

document was signed by the President on 29th April 2014, and shortly after on 1st May the state-owned broadcaster commenced digital broadcasting for the San José Metropolitan area. This became the first occurrence of officially licensed digital terrestrial television broadcasting in Costa Rica.

■ Photo 3: The start of digital broadcasting by the state-owned broadcaster



#### 5. Technical cooperation with broadcasters, etc.

I worked with the MICITT to provide technical cooperation to related organizations. I supported the communications supervision agency (a government organization with authority over broadcast licenses and radio administration) with matters including setting the parameters of their electric field calculation simulation software, and developing methods for testing interference of analog broadcasting. I also visited the studios and transmitter stations of small and medium-sized private broadcasters, and provided them with support regarding the facilities and migration procedures needed to start digital broadcasting.

#### 6. Adapting to a unified standard in Latin America, and promoting this standard in Central America

I also interacted with countries outside Costa Rica. In countries that have adopted the ISDB-T system, study groups were set up to achieve unified technical standards. From our specialist Yasuji Sakaguchi, who was at the time on deployment in Peru, I took over as research group coordinator for EWBS (Emergency Warning Broadcast System), proposed an EWBS draft standard at a conference held in Uruguay in May 2013, and obtained approval for our technical standards. Also, in the Central American countries of El Salvador, Honduras and Guatemala, steps are being taken towards reviewing the standards determined based on the ATSC system, and we visited each country to promote the ISDB-T system with the cooperation of Japan's Ministry of Internal Affairs and Communications and the ARIB (Association of Radio Industries and Businesses). In Honduras, I gave a presentation at an event sponsored by the government and seminar lecturers. About one month after this event, Honduras decided to conduct a review of the ISDB-T system.

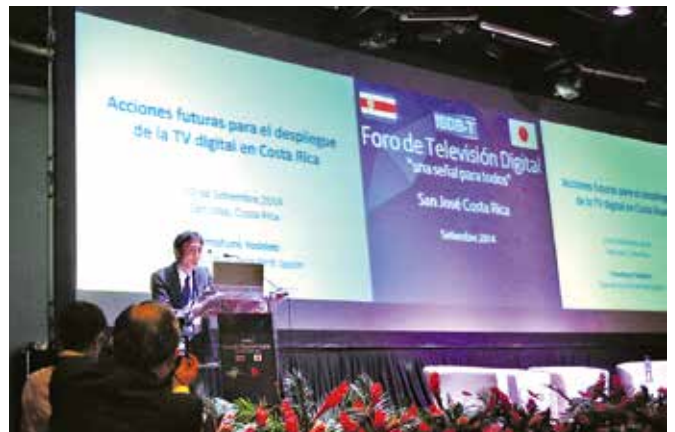
■ Photo 4: International experts at the Uruguay conference (From left to right: Matsuoka (Angola), Hirose (Peru), Sato (Uruguay), Nakakita (Ecuador), me)



#### 7. Towards the deployment of digital broadcasting

In parallel with the movement towards starting digital broadcasting by the state-owned broadcaster, TV receivers equipped with ISDB-T tuners have also appeared on the market. About 2 weeks after returning to Japan in early September 2014, a two-day seminar on terrestrial digital broadcasting was held jointly by the Japanese and Costa Rican governments. Several Japanese companies took part, and some of them gave presentations and offered technical training sessions. The event was attended by about 300 people, including government officials, broadcasters and import businesses, making it a very significant event with regard to the development of digital broadcasting in Costa Rica. This was the last thing I worked on in Costa Rica, bringing two and a half years of technical cooperation activities to a close.

■ Photo 5: Author presenting at a terrestrial digital seminar



#### 8. Finally

I would like to thank everyone who gave me the opportunity to work abroad and everyone who supported me while in Costa Rica, and since the experience I gained in Japan enabled me to carry out my activities without any hitches, I would like to thank everyone who contributed to this prior experience.