

## **Study Group on Next-Generation Broadcasting Technology — 5<sup>th</sup> Meeting**

April 17 (Tue.), 2007

[Harashima (Chair)] Now, please allow me to open the fifth meeting of the Study Group on Next-Generation Broadcasting Technology a little bit earlier than expected. Thank you for attending the meeting.

Today I would like to proceed with discussions about the draft report from the study group, but before that, I have some member changes. Please let the Secretariat introduce all of the attendees, including representatives or working group staff.

[Kondo (Deputy Director of the Broadcasting Technology Division)] In response to the appointment of Mr. Kishigami as a director of NTT Cyber Solutions Laboratories, Mr. Kishigami replaced Mr. Ogawa as a member. Mr. Kishigami, I am looking forward to your participation.

[Kishigami] Thank you for the introduction.

[Kondo] I would like to introduce all of the attendees acting as representatives first. Mr. Koike from KDDI R & D Laboratories is attending the meeting as a deputy for Mr. Akiba.

[Koike (Mr. Akiba's deputy)] It is nice to meet you.

[Kondo] Mr. Tsuzuku is absent today for personal reasons.

Mr. Takizuka from Sony and Mr. Sato from Sharp are attending the meeting as presenters.

[Sato] I am Sato. I am pleased to meet you.

[Kondo] This is Mr. Suganami from NHK Science & Technical Research Laboratories.

[Suganami] I am Suganami. It is nice to meet you.

[Kondo] This is Ms. Takahashi from Fuji Television.

[Kazuko Takahashi] I am Takahashi. I am glad to be here.

[Kondo] This is Mr. Takahashi from Mitsubishi Research Institute, who has cooperated with us in creating conceptual illustrations and the questionnaire survey.

[Tomoki Takahashi] I am Takahashi. Nice meet you.

[Kondo] This is Mr. Nakamura.

[Nakamura] Nice meet you.

[Kondo] That ends my introduction of new attendees.

[Harashima] Thank you very much for your introduction, Mr. Kondo. I am glad to see you again.

Now, please allow me to expedite proceedings. Before that, however, I would like to have the documentation confirmed by the Secretariat.

[Kondo] Please open the first page of the agenda. Material document 5-1 is the minutes (draft) of the study group's previous meeting. Material document 5-2 is a meeting summary (draft) of the previous meeting.

Material document 5-3-1, in landscape orientation, is an outline of the draft report from the Study Group on Next-Generation Broadcasting Technology.

Material document 5-3-2, which is a thick one, is the draft report from the Study Group on Next-Generation Broadcasting Technology.

We are now delivering to your main table, from Mr. Ishibashi, a member of the working group, some papers that have no document number.

Then you have the result of questionnaire survey as material document 5-4 from Mitsubishi Research Institute.

Finally, we are delivering, to only your main table, the public comment and entry form of the draft report from the Study Group on Next-Generation Broadcasting Technology.

That is all.

[Harashima] Do you have all material documents?

OK, I am going to have today's agenda. Let us look at material documents 5-1 and 5-2.

These are the minutes and summary of the 4<sup>th</sup> meeting, which was held on March 13. I think each of the study group members have made inquiries to the Secretariat on these in advance and that they will be found on the MIC website in a few days. If you have any

questions about them, please ask the Secretariat later.

We have just confirmed the minutes of the previous meeting, so let us go on to the next agenda item. Today's subject is the draft report from this study group to be discussed. Yesterday, we heard from the Secretariat that the draft report would be sent to all of you by mail. However, this is a very thick document, so I am anxious that some of you may not read it through and

I feel that some want to listen to your detailed explanations here at this meeting. I would therefore like to first ask the Secretariat to do the briefing, and then have the editor of each working group in charge of having written Chapter 2, Future Systems, talk about the points of the report.

First, I would like you to explain the entire flow.

[Kondo] Well, I am going to explain the outline of the report with regard to material document 5-3-1.

Please open page 1 and look at the table of contents. In the rough composition, Sections 1 and 2 of Chapter 1 respectively deal with the technological trend surrounding broadcasting technology and the points to be incorporated in discussing next-generation broadcasting systems.

Chapter 2 describes the expected next-generation broadcasting systems that this study group has discussed so far. I would like each of the authors to explain the details later. Section 6, Chapter 2 gives additional descriptions of the relationship in the TV program-making technology that was pointed out at the previous meeting.

Basically, in response to the information given in Chapter 2, Chapter 3 describes the keywords extracted for easy messaging as a concept for implementing next-generation broadcasting systems, and illustrates the images of such use.

Section 2 provides the scheduled objectives for technology development to implement a specific next-generation broadcasting system.

I would like to briefly introduce the contents. Section 1, Chapter 1 on page 2, "technological trend surrounding broadcasting," describes the entire technological flow of the world. Though the details are omitted, there are the above two portions in regard to the trend of broadcasting technology, including the development of ultrahigh-definition digital broadcasting, the progress of practical mobile broadcasting, and the accelerated development and spread of image coding technology which is the key to high-quality image transmission.

In the communication technology trend on the right hand, broadband services have penetrated the actual national life, and technology development toward the increase in

broadband use has been advanced. In addition, security technology toward implementation of the communication infrastructure as well as safe and secure broadcasting has increasingly been put to practical use.

Let us then go to page 3. This is the trend of information processing technology. First, CPU throughput has improved to four times the performance it exhibited three years ago. Its advance has continued according to the Moore's Law. Second, how to address the increased scale of software behind digitization has become an actual problem.

The information storage technology trend is given on the right side. HDD surface recording density has increased at an annual rate of more than 40%. It appears that this will be the factor for speeding up time-shift viewing, which has been discussed in this study group.

Larger-capacity optical disk and solid-state memory have continued to develop.

On page 4, you see the information I/O technology trend. Multi-pixel and intelligent image pickup devices have been advanced, and large flat-screen, high-definition and highly realistic sensation displays have also been developed.

On the right side, you find the battery technology trend. Successful development of materials for secondary batteries has steadily improved volume energy density. In addition, commercialized micro fuel batteries are expected to remarkably improve in energy density. This is the basic technology that has been utilized extremely in the safety and security described later.

Let us go on to page 5. The four points to be incorporated in discussing next-generation broadcasting systems are given in Section 2, Chapter 1. The first three points were discussed at the previous meeting. The first point is that viewing is provided only through easy operation in terms of any wide spread through the national life; that this is the means to get fundamental information such as safety and security in case of disasters; and that you should pay attention to the compatibility of all broadcasting systems, once introduced, in terms of popularization of TV sets. It also means that you should pay environmental attention to avoid device replacement even if a broadcasting system is changed.

The second point is that human-friendly, comfortable media with which people do not need to get information aggressively should be provided because viewers are basically passive, although interactive aspects have recently been advanced. The third is that the demand for highly realistic sensation remains unchanged from that which has been required for original broadcasting.

The fourth is a new one—the broadcaster viewpoint that was pointed out at the previous meeting. At the previous meeting, we discussed what kind of broadcasting system people wanted from the audience viewpoint. This time, we invited public comment from broadcasters as working group members.

Consequently, there are some indications that while the proposed services are very attractive, the convenience for TV program creators should be improved, various formats including metadata should be standardized or a copyright protection problem should be cleared. This time, we have added the fourth point to the above.

We are going to omit the 6th page and after, because the expected next-generation broadcasting systems mentioned in Chapter 2 will be explained by each of the authors who were responsible for the respective portion in the working group. Please open page 19.

We have added something new to page 19. Section 6 describes three major points of sophisticated TV program creation technology. The first one indicates a wireless camera system. You can see the camera illustration herein. The elimination of camera connector cables enables the camera crew to move quickly, thus providing a variety of stage directions, such as photo shooting at various angles.

The second one is the creation of metadata and standardization of utilization systems, which are given at the bottom of the page. As one of program creators' burdens is to manually provide metadata, this is the viewpoint of putting a tool that automatically provides or supports metadata for image content into practical use.

The third is on the right side, showing a TV program creation system that uses wired and wireless networks. It is composed of a group of servers capable of storing large-capacity broadcasting materials, and some networks for transferring those broadcasting materials between such servers. This provides extensibility, reliability and convenience to implement efficient TV program production.

From there, let us go to page 20. This illustrates an implementation concept for the next-generation broadcasting system mentioned in Chapter 2, which is given as a specific illustration of the vocally described concepts mentioned at the previous meeting, not by pictures. There are some subjects or keywords from the user's point of view. The first is the viewpoint of human friendliness or comfort surrounded in yellow above. In this concept, it is possible to view what you want to watch on TV anytime and anywhere in terms of providing human friendliness and comfort when you turn the TV on. This is based on the assumption that there is no change, even in technological evolution, in the primary TV viewing form in which you can enjoy images/sounds or can choose your favorite TV shows through easy operation.

You can see some pictures below. In the upper left corner, pre-registering your sex, age and hobbies allows the TV itself to recommend some TV programs that are appropriate according to your favorites. In the picture underneath it, the TV set automatically understands the viewer, even without prior registration, and replaces a harmful scene with another one when children watch TV.

In the upper right corner, it is possible to automatically edit the TV program that is most frequently requested by viewers in real time or to display, through computer graphics, such images as your participation in a TV program.

The ultimate case where TV becomes intelligent is shown in the lower right corner. By understanding the physical characteristics, health condition or, in a more advanced case, psychological state of a viewer, TV can enlarge the caption automatically, convert the color tone or adjust the conversation speed for the aged, for instance. In addition, this is a considerably advanced function. If the TV becomes aware that you are in bad health, it automatically informs the doctor of such.

Shown on page 21 are the technological items for implementing the previous illustrations in the system configuration. I am going to skip detailed explanations.

Please open page 22. This is the second point. It seems that mobile terminals will become more multi-functional with the progress of mobile technology that provides high-quality viewing anytime and anywhere. You also see another picture below, showing that the terminal components, including panels, can be partially recycled or replaced, as another point of view.

As illustrated at the upper part of the bottom picture, this is an idea of modularizing the receiver, which is called a paper display. If you have a folded paper display, you can enjoy newspaper or magazine applications with high-resolution images by unfolding it. In addition, you can enjoy high-quality pictures anywhere with an ultrahigh-performance mobile terminal equipped with a compact ultrahigh-definition screen and large-capacity memory. As I mentioned above and you see in the picture in the upper right corner, it becomes possible to replace part of the hardware with a new, high-quality display.

In the lower picture, it is possible that, with a micro projector built into your cell phone, you can enjoy images on the large screen by projecting them on the wall or you can also enjoy 3D images.

The system concept is shown on page 23. Please go to page 24. This third point is the acquisition of more sophisticated information. The keyword is “Just Now, Just Here, Only for Us.” It is therefore possible to implement a service that provides more sophisticated information, just like sending information to viewers within a specific area, for instance, through linkage to a mobile terminal, or to rewrite the functionality itself of a receiver terminal via broadcast waves. I think this may be referred to as software radio. In other words, you do not have to buy another terminal even if you have the wrong broadcasting system and ultimately you can use it in a foreign country. Sorry, I have just found a typo. This sentence says “you can renew your terminal” but the true one is “you do not have to renew your terminal.” In this concept shown by the lower illustrations, where a mobile

terminal is available anywhere, if you go near an art museum at a tourist spot, information about the museum will be provided to you. If you visit a different country, your terminal will be automatically set to its system.

Page 25 shows a system concept, so I am going to skip it. On page 26, you have the fourth point of the ultimate in highly realistic sensation, showing a concept where you can enjoy ultrahigh-resolution images or 3D images on the large flat-screen TV with a wide viewing angle mounted on the wall at home as well as stereophonic effects. As illustrated here, this concept provides you the possibility that you will ultimately be able to feel the image itself, smells or the atmosphere as well as images or sounds in broadcasting.

I am skipping page 27, which is showing a system concept. Let us go to page 28. This page describes how safety/security information is provided without fail. In case of emergency, you will be able to use a receiver terminal capable of automatically launching and receiving disaster information on evacuation areas or safety even in the case where you are in an underground mall, in town or anywhere. Though technology has been relatively developing, this concept provides you the potential to offer appropriate safety/security information to each of us if almost all of us will have a device, such as one-segment terminal, in the future. Let us go to the last page, page 30. The entire view of what has been so far described above is shown on this page. In addition to the concepts that give human friendliness or comfort in collaboration between broadcasting and communication, a portable, foldable display is also illustrated so that you can imagine the implementation of next-generation broadcasting systems that will provide convenience, high quality and safety/security in case of emergency.

That ends my briefing, so I would like presenters to explain the details of Chapter 2.

[Harashima] Thank you very much.

Well, I would like the members of each working group and the editors who cooperated in creating the draft report to report on the important points of each subject. You will have 10 minutes for reporting.

Please allow me to first introduce Mr. Takizuka from Sony Corporation, who was responsible for compiling (1) "Development of Ubiquitous Receiving Systems."

[Takizuka] I am Takizuka from Sony Corporation.

Please look at page 7. At first, ubiquitous receiving systems are described in terms of storage functionality. The increase in capacity can provide a highly realistic sensation service. Consequently, an ultrahigh-quality image service, ultrahigh resolution or high frame rate comes out. While part of the technology is under development, such a device

becomes stable as “beyond HD.” Moreover, a band is used for 3D or five-sense transmission. Following that, an HDD or other storage device will be used with those systems. This is the trend from the viewpoint of storage capacity.

I have one more thing to tell you. So-called automatic filtering will be provided to pick up information to be received. In other words, the receiving system will perform a rating function to automatically determine whether it can be viewed or not.

As the second phase, as a very large amount of data is basically stored, you should focus on how you find it. I think a storage trend will be to implement a receiver with an intelligence function that allows data search based on a user’s preference.

Let us go to page 8. User interfaces are described on this page. It becomes possible to provide a function that enables implementation of a desired interface automatically by pre-registering a user’s preference, and also to display an optimum screen for aged, disabled or foreign people. A system will be able to automatically authenticate personal information first and identify an individual. I think using such information will provide user-friendly interfaces or concierge services.

One more point is to implement user interfaces that apply to a viewing environment for use. Such interfaces work while you are walking or driving. When you are walking while watching images, a receiver will functionally sense obstacles and warn you if any exist. I think such a device could be feasible.

This is the point of user interfaces. I think it becomes possible to implement the scene where user interfaces for aged, disabled or foreign people perform automatic authentication by making the most of high-performance CPUs.

Let us go to page 9. The software-based renewal of a receiving function is mentioned on page 9. In the text, the modularization of a receiving function is given as an example to explain this renewal. One concept of modularizing the receiving function is to make no unnecessary changes. In other words, a functional change can be done by replacing part of a device, not by discarding everything. The concept is based on the viewpoint of waste reduction or natural environment friendliness.

The software-based renewal of a receiving function means that some change can be done by software at a certain level. I think it is possible to address a certain level of component that automatically configures an optimum modulation circuit by automatically discriminating radio waves, for instance. If the architecture is considerably different in the first stage of development, the situation where some changes would be required is taken into account. I think, in such a case, it will be possible to address such a change in two stages, just like replacement of the whole module. However, for modularization, I think there may be a high barrier to overcome in terms of standardization or security.

Finally, I think we did not work very well because the volume of the report is too great. Home security is described as home networking, including remote medical care. We also described the potential to establish a network such as one that orchestrates the whole house as a created environment through good harmonization.

That is all.

[Harashima] Thank you very much, Mr. Takizuka.

Let us go to (2) “Development of collaboration between broadcasting and communication.” Mr. Ishibashi from NHK Cyber Solutions is in charge of this portion. However, he is absent today for a personal reason, so I would like the Secretariat to explain this portion.

[Kondo] I would like to give you a brief explanation according to the two sheets of paper on your table written by Mr. Ishibashi of the working group.

First, Mr. Ishibashi pointed out that there were three big environmental changes overall as compared to the previous reporting time. The first is that the spread of broadband communication networks has enabled almost all viewers to use always-on connections at an inexpensive rate. The second is long-tailed services as a big environmental change. A variety of services such as so-called Pod-casting and YouTube have emerged and various receivers have also been available, including personal computers or mobile phones. Moreover, there have been various content patterns including blogs and SNS, which is typically sent for specific communities.

The third big environmental change is that as high-definition TV becomes more popular, user awareness of high resolution and high quality has also increased. Based on the previous report on the basic structure of offering combined attractive services by broadcasting basic common content and separately transmitting additional content through communications, we have focused on advanced users of communication networks with fast always-on connections, especially on upstream channels, so that high-quality content services can be provided as the main features.

As for the trend of adding content for communities, a new section of community type/viewer-generated broadcasting has been described. The importance of standardization for assuming compatibility is incorporated into each paragraph from the viewpoint of advancing coexistence with the current broadcasting service and seamless transition. Each of the specific descriptions is given at the bottom of page 1. In this paragraph, a request broadcasting service is described to provide highly realistic sensations or to view an image from any location by transmitting additional information, greater than that of basic content, according to a user’s request, or to implement broadcasting that is more

sophisticated specialized in local information or individual attributes obtained through communication networks.

As for bidirectional broadcasting, a remote viewer call-in service using a fast upstream communication network is also described as a highlight. Newly added community-/viewer-generated broadcasting services include one in which an individual is a viewer as well as a broadcaster or provider in a closed community.

The work results of collaboration between communication and broadcasting are described on page 2. In the second paragraph, three important technologies come out in terms of what should be reported as a message. The first one is the technology using communication networks; the second one is the media technology providing high-quality image and sound with highly realistic sensation; the third one is media recognition technology.

As for the first one, relating to communication networks, it has become possible to upload content that can be easily used as high-quality image material in real time. This allows users to have completely new broadcasting business opportunities, including the services that have been so far given up.

As for the second one, of providing media technology with high quality and highly realistic sensation, we will have another opportunity to develop hardware or conduct sales business in the same manner as the current transition from CRT to flat-panel display.

As for the third one, of media recognition technology, this enables recognition and understanding of content, easing search through the automatic addition of program metadata, reducing the burden of edit work through the use of scripts, evaluating information reliability, conducting TV program classification tests and protecting copyrights. Many problems, such as implementation of safety and security, will consequently be resolved.

That is all.

[Harashima] Thank you very much. I have been impressed with Mr. Ishibashi's easy-to-understand presentation.

Well, the next is Mr. Sato from Sharp Corporation, who was in charge of compiling (3) "Evolvement of Mobile Multimedia Viewing." Mr. Sato, please give us your briefing.

[Sato] I am Sato.

For my presentation, please open pages 12 and 13 of the summary document, and page 67 of the thick report. This is the evolvement of mobile multimedia viewing. The biggest difference between this report and the previous one is the commencement of one-segment service. The collaboration between broadcasting and communication has just begun as an

actual service.

The point to next-generation broadcasting technology is described at the top blue square of page 12. There are three points:

high-quality broadcasting for mobile terminals, high performance, and development of portable and easy-to-use advanced mobile terminals. Different expressions are given in the report, though they are basically the same.

The first point is high quality. In the report, actually, high image quality and high sound quality are described.

The second important point is to create portable, easy-to-use mobile terminals. This means sophistication of mobile terminals. The third point is high-performance mobile terminals, which is described as high-performance, bidirectional mobile terminal in the text. Of course, receiving is important in broadcasting. As mentioned previously, I think bidirectional transmission is also important. In short, the above three points typify more advanced mobile terminals. The third important point is high-performance, bidirectional mobile terminal.

These points are what I focused on in the report.

There are six items, which are roughly classified in the report. Three of them are shown on Page 12. The first one is technological collaboration between portable receivers and desktop receivers. The second one is more sophistication of mobile terminals. The third one is broadband high quality and high-performance broadcasting technology for mobile terminals. The fourth one is the advanced one-segment service mentioned on page 13. The fifth one is bidirectional broadcasting service. The sixth one is to make content in cooperation with other media. The above are described in a different order of appearance in the report, with the second item in the summary, which is more sophistication of mobile terminal, appearing as the sixth one in the report, but these are basically the same.

The first item is technological collaboration between portable receivers and desktop receivers, which is roughly classified into three points in the report. The first one, mobile multimedia broadcasting (mobile server broadcasting), is at (1) on page 67 of the draft report; the second one is collaboration with home servers and home networks, which is given on page 71; and the third one, which is given on page 75, is on-demand distribution of local information based on a receiving point.

The first point, cumulative broadcasting for mobile server type broadcasting is a so-called push type service. Such a service will be incorporated as next-generation broadcasting for mobile terminals. The second point, collaboration with home servers and home networks is described in terms of enjoying home content with a mobile device or outside through collaboration between a fixed TV set at home and a recorder called a PVR.

The third point, on-demand distribution of location information based on a receiving

position is described as local server type broadcasting.

The second item, more sophistication of mobile terminals, though mentioned as the sixth item in the report, is given on page 96. The main point mentions that a mobile terminal is limited in display size and terminal size. In terms of what technology provides high image quality, high sound quality or usability within such limitations, our suggestion in the report is the possible development of a mobile terminal that is equipped with a single ultra-large projector or flexible display as mentioned above. Such a portable unit could be used as a stationary TV set and provide a large screen in a compact body.

The third item, broadband high quality and high-performance broadcasting technology for mobile terminals, though having the same content, is given on Page 78 of the report. This is also related to mobile server type broadcasting. In the future, broadband use in broadcasting will be able to provide higher-quality information.

We have described how to send information focusing on technology development, including high-quality images/sounds, flexible transmission based on bandwidth, GPS-linked information transmission focused on local information, or uploading and filtering of the content to be broadcasted.

Let us go to page 13 of advanced one-segment service, which corresponds to page 84 of the report. I think the current one-segment service will become more advanced. Basically, our description focused on how the one-segment service will become advanced in the current receiving system, from the viewpoint of a possible less than one-segment delay, switchover of the number of segments in a transmission band or a modulation method, or feasibility of broadcasting based on the characteristics of content.

As for the fifth item, bidirectional service, though mentioned in fourth place as mobile bidirectional service on page 86 of the report.

We have named it a mobile bidirectional service. In addition to the uploading of content mentioned above, we have positioned broadcasting as the means to provide bidirectional exchange of high-quality image/sound information.

Although mentioning again the merging communication/broadcasting fields, I think, as technological progress, common data is acquired from broadcasting and individual data from communication, you chat in SNS while watching TV, you receive broadcasting with a mobile receiver upon request, or finally a TV program like a scenario engine is automatically created or distributed.

As for the last item, making content in cooperation with other media, this is mentioned as the Number 5 item on page 94 of the report. If much content was transmitted and/or received with a bidirectional service, a variety of easy-to-use services could be implemented by linking much content together. Therefore, this summarizes how to make

content in response to such a demand. Specifically, we have showed some examples of technological advances, such as you could operate objects in a simple technique with a receiver terminal or put some links to associated sites, or an object image is automatically extracted in making content or relevant information is automatically generated.

That ends my explanation.

[Harashima] Thank you very much.

Well, let us go on to the next item, “realization of broadcasting of highly realistic sensation.” I would like to introduce Mr. Suganami from NHK Science & Technical Research Laboratories, who is in charge of reporting. Mr. Suganami, please explain your part.

[Suganami] I am Suganami. I would like to start my explanation on page 99 of the report.

As for the realization of broadcasting of highly realistic sensation, we dealt with four items in the previous report of 2001, but this time we handle six items in all by adding new two ones.

I initially focused on ultrahigh-resolution and wide-field images, which are the most specifically described among the above six items.

As you know, ultrahigh-resolution images have already been demonstrated through the super hi-vision developed by NHK. However, we have to provide ever-heightening levels of this elementary technology. I think a prototype system using that technology might be used for a satellite experiment by about 2011 and a so-called public view service will be started and offered to general audiences.

I think more ultrahigh-resolution image content will be provided through more experiments in the second phase and will begin to spread to home consumers through further equipment development in around 2020.

However, this does not mean the current hi-vision TV systems are replaced rapidly with ultrahigh-resolution images. I think three types of compatible image formats with 2000 scan lines, 4000 scan lines and hi-vision would be used in accordance with content category or display specification.

Let us then think about an ultrahigh-resolution image system configuration. As described on page 100, this ultrahigh-resolution image system television will consist of a broadcaster’s production system, transmission system and reception system.

Judging from technical specifications, a recording device, a coding device, a transmission system or display will obviously be determined on the assumption that it must be able to process ultrahigh-resolution images with the following information volume, such as 4000

scan lines, about 32 million pixels and 60-frame signals.

There are technical issues in each of the above-mentioned stages. I think the key devices are an image pickup device as an input and a display unit as an output. As explained in the broadcasting technology trend mentioned previously, it is predicted that CPU throughput or recording density will improve with the times in regard to signal processing or recording. I think a breakthrough is required for input and output devices, however, and popularization of ultrahigh-resolution technology depends on how fast you achieve breakthroughs in such devices.

Look at the last item on page 101.

I think it is indispensable to establish international standardization in consideration of future popularization. In particular, I think that promoting standardization of equipment and relevant systems could link directly to the popularization mentioned above.

Let us then go to page 102. This is a 3D image system, which will appear in the era following ultrahigh-resolution image systems. I think various methods are under research and development, and will continue to following their own paths.

Roughly speaking, I think a two-lens system or its extended multi-lens system would be put into practical use in partially restricted fields in the first phase. During the second phase, I think an image playback type that can provide more natural 3D images could be put into practical use, because such an image system requires a huge number of pixels (pixel density) for cameras or display devices. On the assumption that the ultrahigh-resolution image technology typified by the super hi-vision mentioned in Number 1 will be considerably popularized in the latter half of the second phase, higher-quality real images, such as 3D images, will appear. I think people can see something in front of them by around this phase.

Let us go to page 104. The third item is stereophony, which has many uncertainties about its future. It is so difficult to describe this portion clearly. In the first phase, a 22.2 multi-channel acoustic system with highly realistic sensation is used for content production, for instance. Entering the second phase, some transition may occur gradually to a system capable of reproducing an acoustic field according to a playback environment, irrespective of the number or position of speakers on the receiving side.

In the latter half of the second phase, you as a viewer can enjoy listening to music at home as if you were seated in a concert hall by having the acoustic space of the whole concert hall transmitted and specifying a desired seat, for example. This is free listening point acoustics as an extension of acoustic application. I think such a thing will become possible.

Let us move to page 106. This is five-sense broadcasting.

As mentioned herein, the five senses include those of sight, hearing, touch, smell and taste.

I think the last sense, that of taste, will not become a realistic system in terms of safety. Therefore, the remaining four senses could be used to make up broadcasting that adds realism. Sight and hearing have already been incorporated into present systems. As for smell, it may be possible to use several kinds of preset smell cartridges in order to generate some smell variations through blending.

As for a sense of touch, a sense of force (hardness) or tactile sensation (rough feel) might be expressed. I think the combination of such senses may formulate five-sense broadcasting.

Nevertheless, technical issues are mentioned on page 108. We have to study primitive issues very hard. We need to develop some technology for sensing a touch/smell or an atmosphere from the viewpoint of the production side, or one for presenting it from the viewpoint of the receiver side. Moreover, taking practical use into account, I would guess that it is necessary to not only make up such technology but also meet viewer satisfaction. Numbers 5 and 6 are new items that we added to the report. Number 5 is free viewpoint image, which means a system that picks up, on the receiver side, a multi-viewpoint image taken at different visual points. For instance, it would become possible, when a viewer requests some images at certain angles in the first phase, for a provider to provide them through a communication network, or for a broadcaster to make such images at various angles and use them as part of stage effects in a sports program, etc.

In the second phase, it would become possible to generate images at desired angles by sending all multi-viewpoint image information to the receiver side for signal processing. The last one, at Number 6, is virtual reality broadcasting. The greater the number of systems required to provide highly realistic sensation, the greater the burden on the content makers. I think the combined service of live-action image and virtual image will be considered to provide virtual backup for such burden.

As an example of assumed services, there is one idea of relaying opera from a famous opera theater. In such a case, some performance will be presented using the ultrahigh-resolution image system or stereophonic system mentioned previously. If it becomes possible to show a route from the entrance of the theater to the reserved seat in the audience through virtual reproduction of the walk through the theater, you can feel realistic sensation. I think this is very likely to be one of the future broadcasting services.

That completes my explanation of the highly realistic sensation broadcasting system.

[Harashima] Thank you very much.

Finally, Ms. Takahashi, is going to provide explanations today on behalf of Kamise from Fuji Television, who is in charge of reporting “assurance of safety and security”. Mr.

Takahashi, please explain your part.

[Takahashi Kazuko] I would like to explain how you assure safety and security. Please open the report to page 112.

To start with, assurance of safety and security has not been described in the previous report, so this is an entirely new item. We roughly classified the items into two parts.

The first part is the assurance of safety and security in terms of the approach in case of disaster or emergency. The second part is the assurance of safety and security in terms of watching television under normal conditions.

Three major items fall under the first part of assurance of safety and security in case of emergency: Number 1—sophisticated information lifeline, Number 2—disaster prevention and Number 3—production environmental improvement.

Number 1, sophisticated information lifeline, has been discussed from two viewpoints: one regarding broadcast transmission and the other regarding broadcast reception.

From the first viewpoint, we have described improvement of broadcasting networks; retransmission of radio waves in closed spaces where no radio waves can reach under normal conditions; transmission of information that is specialized in a very narrow area in collaboration with communication and broadcasting, such as DSRC; and transmission of safety/ security information.

We also described high-performance batteries and lower power consumption of receivers in order to improve receiving performance; in other words, to assure safety and security.

Current mobile receivers have about 4 hours of continuously available time. We have suggested that lower power consumption and high-performance batteries could provide continuous operation of approximately 12 hours during daylight hours through overnight charging in the latter half of the first phase. Wireless power supply technology, though not incorporated in the first report, has been highlighted recently. In the first phase, this technology can be used for standby power. In the beginning of the second phase, it may be wholly available. This has been also described.

In the second phase, a variety of high-performance batteries, such as small fuel batteries or dye-sensitized solar cells, will be put to practical use. It may become possible to pick up and use a battery according to the application. No mobile terminal for broadcasting use has been so far available to receive satellite broadcasting directly. I wonder if such a mobile terminal will be available in the future. In this report, although it almost sounds like fantasy, such a thing could help improve broadcasting networks.

As mentioned previously, re-multiplexing of local area information can further assure safety and security. We have also discussed the possibility of sophisticated satellite

broadcasting—in other words, of sending mass data broadcasting for a specific disaster area by using a very simple and compact receiving antenna by transmitting a step-up beam through satellite broadcasting that uses 21GHz. Moreover, it is suggested that a next-generation modulation method might be developed to enhance the robustness of radio waves and provide stable broadcast waves.

As for the second item of disaster prevention, it will become necessary to improve emergency warning broadcasting reception or to automatically start up receivers once an earthquake emergency message is issued.

However, it is extremely difficult to implement the automatic start of each receiver unless the problem of receiver power consumption in the standby mode is resolved. That is why such receivers have not become popular so far. As mentioned above, if battery performance is improved or a wireless power supply technology is evolved, every receiver might be equipped with an automatic start function for receiving emergency warning broadcasting. It would allow a mobile terminal near at hand to immediately receive information that is more accurate. That is why this is quoted in respect to assurance of safety and security.

Third, this is improvement of the production environment. Emergency news reporting sites differ from those under ordinary conditions. In most cases, the production environment is very bad, including lighting, power supply and radio propagation. Even communication networks that are usually available may become disconnected in case of disaster in the end. It is therefore necessary to improve the production environment to meet such a demand.

First, the development of high-performance cameras, such as ultrasensitive cameras capable of taking pictures in very dark places, ultrahigh-definition cameras like the current super HARP, more advanced ones including radio cameras capable of taking pictures of shielded objects by using a radio wave or millimeter wave that can pass through fog or smoke blocking off the light, is expected.

Development of a device for relaying the images taken by the above cameras, as well as an extreme broadband network, such as millimeter wave ad hoc network, is also expected.

I think the use of robot technology should be considered in the future broadcasting field. As mentioned in the production environment a little bit, it is necessary to build a temporary wireless relay line through a mountain in order to transmit images taken by a self-contained robot camera or images from a disaster site to a broadcasting station. In such an extremely severe environment, a robot automatically builds the relay line. The report forecasts that not only cameras, but also robots, will become necessary, and that robots will be used for maintenance of transmission systems on a daily basis.

The fourth and later items describe the technology that will allow people to enjoy content comfortably at ease in normal times rather than in case of emergency or disaster.

The fourth item is assurance of information reliability, including the improvement of security measures. Broadcasts are sent as radio waves called broadcast waves. In other words, what is sent as radio waves is mainly broadcasting. In the future, it is considered that the time would come when content distribution using general Internet networks as well as CDN is also called broadcasting. This item describes the possibility that security measures against attacks on networks will become very important from such a viewpoint.

In terms of assuring content reliability, the discrimination between broadcast content used under the Broadcast Law and communication content is partially mixed in name, like Internet broadcasting. Nevertheless, from the viewpoint of the receiver's environment, the origin of content, where content comes from, can be identified almost 100% of the time. However, as digitization develops, it appears that multiple content influx routes to homes will increase more and more. In addition, it is assumed that display units will be integrated as well. In the future world, what is coming through communication and broadcasting will be displayed together with a single terminal.

In this paragraph, the technology for assuring content reliability is described because it could become necessary to provide information about how reliable what content is as auxiliary information for an audience to utilize information.

In the future, it could be possible to use the technology for not only identifying and authorizing a content originator or issuer but also judging information reliability through image-/sound-based content analysis as well as text-based analysis by searching content. In addition, it seems that automatic detection of malicious content or security measures against information leaks will become increasingly important.

I think it seems that an automatic addressing function for vulnerabilities including security patches or virus actions will become most important for household electric appliances with regard to information leaks.

When an on-demand service is provided by using a bidirectional function, ID-/password-based personal identification has been used up to now.

In the future, adoption of biometrics authentication to ease individual identification will increase.

The sixth item describes the viewpoint of copyright protection. Many copyright problems, such as with YouTube, have occurred in recent years. I think various technologies for automatically recognizing invalid content, such as digital watermarking, or to identify the same content at high speed by using the characteristics of an image or sound will become available as measures to prevent the use of illegal content.

As for content copyright handling, it is difficult to unify part of the content that users want, depending on the system. It seems that a common DRM interface and the like will be

established in the future. Image content level security technology is also introduced.

The seventh and final item introduces broadcast applications that contribute to safety and security. The application technology for emergency medical services, though similar to the technological application for re-multiplexing the local area information mentioned above, provides local medical care information or remote diagnosis or surgery using ultrahigh-resolution images, which has been expressed as UDTV in the summary. Therefore, it seems that these applications based on technologies developed in the broadcasting field will be available in the near future.

As for crime prevention, some concepts are introduced in the report, such as using television or mobile receiver terminals to show distribution of specialized security information for each area, or the use of portal television in collaboration with e-government systems.

As for safety and security of lives, this introduces the possibility to distribute all life safety and security information, including crime prevention or weather information.

The fifth viewpoint, that of education, introduces the possibility of school education using the copyright domain management technology as a new idea that has not been adopted so far, or free use of content within a limited range, such as at schools or homes.

The sixth item, that of virtual community safety and security, which is not mentioned in the previous report, has been added. General viewers use SNS or chatting to talk to each other about broadcast content, or they frequently post pictures or novels to release their own content to the public. It seems that much broadcast content will be distributed by individuals in the future.

In such a case, parts of some sites in virtual communities provide a posting standard for assuring community safety, or volunteers censor content. In the present situation, there are a huge number of problems in maintaining a censoring system. Considering individual transmission of broadcast content or increase in users by age bracket, it should be very important to assure the safety of a virtual community.

That concludes my explanation of safety and security.

[Harashima] Thank you very much.

With that, we come to the end of the explanation of the current draft report, and I will tell you the future schedule. We appreciate your efforts. We now have the completed draft report. If you have any questions about it today, please give us your comments. This is a huge document, however, and when you read it again later, you might say, "Oh, no, I should have made a comment at that time."

Let me say something first. We delivered an entry form to your seats around the main table

today. If you have anything you are aware of after today's comments, please fill out that form and submit it to the Secretariat by next Wednesday. I think the Secretariat wants to ask for public comment in response to various opinions. Next-generation broadcasting is extremely significant for the national life, and this also remains a considerable concern to broadcasters as well as to manufacturers. That is why public comment should be invited in various forms.

Based on your opinions that we receive within the next week, we are going to work to invite public comment about one month after the holiday week in May.

Meanwhile, I would like to invite comments from all of you. Finally, in response to public comment and member opinions, I would like to compile and release our report by the end of June. The next meeting is the final round. I think the meeting will be held at the end of June to release the report. I think it is hard to invite comments because of a voluminous report. If you are aware of anything, please let me know as a comment.

[Mitani] I would like to point out something. In the explanation of various items in Chapter 2, it might be an editorial mistake, I suppose. Some parts written in Ming style are isolated and some in Gothic style.

[Harashima] Is that the text part?

[Mitani] No, it is not.

[Harashima] You mean a PowerPoint file, do you not?

[Mitani] Yes, I do. I would like to know the reason why this is isolated in a different letter style in terms of feasibility, for example. By my intuition, I feel the Ming style designates something that is weak or not feasible.

[Harashima] I feel that the parts written in Italic letters are not realistic.

[Mitani] You are right. I would like to know whether these parts are feasible and realistic or not.

[Kondo] As you mentioned it, we use the Ming style to express our anxiety about the feasibility.

[Mitani] The Gothic style shows you are considerably confident, does it not?

[Kondo] Yes, it does. The Gothic part is somewhat technologically sound, but I think we

should rearrange these parts again toward finalization. The concept is almost correct.

[Mitani] I see. Thank you very much. I have one more thing to ask you. Please look at page 6 of the PowerPoint document, Section 2, Chapter 1.

After reading the objectives of this study group at the end of the report, further collaboration with communication and implementation of highly realistic sensation and new broadcasting services are expected to enrich national life to a greater degree. The objectives suggest that we should conduct discussions with a goal of this or from this point of view. If so, I think you should put the phrase “to enrich national life to a greater degree” or “further collaboration with communication” into the point you take your stand on. The majority of the suggested future systems are in combination with communication. Collaboration with communication or the fusion of communication and broadcasting, though incompatible as oil and water, should be included in the point you take your stand on if considering implementation in around 2025. I think this will clarify the entire aspect of next-generation broadcasting technology in consideration.

[Harashima] Do you mean compilation of the whole part?

[Mitani] If you put out a draft tailored to the whole compilation, point to take your stand on or the objectives of this study group, for instance, I think the report will be easier to understand. I think it might be OK if you used the wording, “to enrich national life,” rather than, “to widely penetrate national life.” Although collaboration with communication is placed therein, I think that wording should be used to clarify the presence of a next-generation broadcasting system.

[Harashima] Probably, on the subject of next-generation broadcasting technology, some people knew I took care of the study group. Having frank comments on next-generation broadcasting technology from various people, I found many people asked the question of whether broadcasting is eliminated in the network era or not. They want to know whether it is true or not.

One more thing is how broadcasting changes our living environment or basically enriches national life. Some people have a negative image of it. As television changed our life for the first time, people want to know how broadcasting will change our future life. Honestly speaking, the master of our domain, who was a master in his own house in those days, used to take the best seat in our old-time living room. The master’s seat has been replaced with a TV set. People have dinner while watching TV, not while watching the master. I think this

is the wrong story to tell. In short, the times have changed.

Well, I wonder how it changes from now on. I have a question about how broadcasting changes when the new ultrahigh-resolution TV time comes.

I am often questioned about how young people address media when they act as a leader or how a generation transition changes the relationship with broadcasting. This report must present some answer to that question, although I think there is a limit because it is compiled from a technical viewpoint.

In addition, I am often asked another question, one about whether terrestrial digital broadcasting is the last one or not. This is an extreme question. Does nothing change after terrestrial digital broadcasting? Some people say they do not want any more changes, though they can withstand those that have been made so far. I think one of the roles of this report is to answer such a question. I also think it is difficult to answer that. I wonder what happens around it. Please.

[Sato] I think my suggestion is considerably related to what Mr. Harashima said. Listening to your explanations, I have three points that I am aware of today. Conclusively speaking, I wonder if what I am saying from now on, though I want to invite comments from all of you, is appropriate or not to be described in a final version of the report of the study group. In other words, I wonder whether the technologies mentioned previously have sufficient power to decide or take the initiative in systems or schemes.

Broadcasting systems have been so far determined according to so-called governmental policies or broadcasters' business logic models. On the other hand, I think there is an inevitable aspect whereby "technology" itself determines systems. On a conventional technology level, systems have been determined so far from aspects of both policy and technology. In other words, the two elements have been establishing a point where they can maintain a reasonable balance between them while having an impact upon each other when determining systems. Nevertheless, reading about the development and possibilities of next-generation technologies described herein, I think there will be a much stronger aspect that "technology determines the system."

I therefore think that this is a technological report, but unless making a comment on the part in which conventional policies or business models become involved, from a technological point of view, people might not be enlightened on those policies or business models, so I am going to talk about three rough points of it below.

Talking about the draft summary of ubiquitous systems around page 8, I think the important phrase that is not mentioned herein is "viewing rate." How long people are discussing the viewing rate is in an unclear state. If "personal authentication" technology is securely

introduced into TV viewing, everyone can know how many people watch television, without saying anything about a viewing rate. In such a case, the viewing rate issue, though this word itself will be meaningless, is never described herein.

Moreover, implementation of personal authentication means that “accounting” can be done accurately. I think discussions about whether broadcasting is free or not are potentially involved in the “personal authentication technology,” but it is not mentioned herein.

Is it OK that such a matter is not mentioned in the report? I mean, “next-generation technology” enables things on such a level. This is an issue of whether you should talk about “additional remarks, from the technology side to systems.” I think you should quit unproductive discussions about whether a viewing rate is correct or not. I think a clue to such a proposal is included in “next-generation technology.”

On pages 13 and 14 of the draft summary, the matter comes out in Chapter 2, Section 3, “Mobile multimedia viewing,” and Section 4, “Implementation of highly realistic sensation broadcasting,” if anything, on page 14. The word not mentioned here is “movie.” I understand there is no mention about movies in the report because this study group is intended for “next-generation broadcasting.” I think it is possible to show a comment that “next-generation broadcasting can provide enough mention of movies if the broadcasting side gives a little bit aggressive idea to entire movies. Of course, the “movies” mentioned herein means movies with the assumption of digital distribution. Listening to the explanation of “highly realistic sensation broadcasting,” the word “theater” has been used more and more. What is a “theater”? As the highly realistic sensation broadcasting becomes more specific, there has been no distinction between a “living room” and a “theater.” In such a situation, there are many words indicating a theater, including “ODS” (Other Digital Staff) or public viewing, without using special words such as digital cinema. I wonder whether the words are involved in the idea of broadcasting or not?

Thinking of next-generation broadcasting to such a degree, I think common items will be born somewhere, such as movies to be digitally distributed and theaters, or movies will be distributable by aggressively taking advantage of IP transmission technology. I feel various aspects of “next-generation technology” should be further described.

I have one more thing to say concerning safety and security. I think another wording should be a little bit more appropriate than safety and security. This refers to “copyright.” In many cases, copyright has so far been considered in terms of protecting what is infringed on. On the other hand, it is also very important to promote secondary use. As a TV program creator, I ‘m frequently asked to rebroadcast a TV program I made because someone wants to watch it again. In the current terrestrial broadcasting system, it is very difficult to rebroadcast a TV program. It is so difficult for me, as a program creator, to know when rebroadcasting is

started. If a “storage technology” to store all TV programs is realized, the concept of rebroadcasting will be quite different. In this regard, “storage” is described in the report, not “rebroadcasting.” If you want to watch the same thing, you can watch it many times. This is not described clearly. In other words, I think you had better explain how broad the technology is.

On the other hand, the safety and security item mentions “personal broadcasting,” which results in discussions beyond the framework of “broadcasting.” I think you may say you look out for that matter while discussing “next-generation technology.” Although the matter is described a little at the end of “safety and security items,” I think it is incorporated into the “safety and security items” as well as legislation on personal broadcasting because YouTube is spotlighted like that.

Therefore, I think you should make a small mention that “technology” is in the position where it can sufficiently forecast and lead the entire broadcasting systems.

That is all of my long suggestion.

[Harashima] Thank you very much.

As for his comments or suggestions, do you have anything to say, especially from the working group or Secretariat?

[Okubo (Director of the Broadcasting Technology Division)] I would like to say something from the Secretariat.

I would like to mention the comment invited from Mr. Mitani. As pointed out above, the purpose of this study group is to clarify that this is very important from the viewpoint of enriching national life. I agree that the point is to indicate such things. As a chapter structure, Chapter 1, Section 2 is the portion indicating the point to take your stand on, as I mentioned previously. I think these things should be described at the judgment of the Secretariat. According to the Secretariat’s judgment or understanding, these will be put together toward the Implementation of Next-Generation Broadcasting, Chapter 3. Therefore, I think the part of targeted enrichment as pointed out by the member should be put at the beginning of Section 1, and technological trend or assumptions to be discussed should be summarized in Chapter 1.

Moreover, sorry, this also depends on the Secretariat’s judgment. I wish you would give us better comments. I agree that the viewing rate issue is part of personal authentication relating to a viewing rate. I think that whatever impact this has should be put at a place mentioning what is going on in next-generation broadcasting rather than technological elements. If it is described, as broadcasting based on personal authentication mentioned

above connects to broadcasting based on an individual request, the change of such a viewing rate should be mentioned as a service image in Chapter 3 as though it comes as another idea in a new broadcasting world, I suppose.

The same is true for movies. A system concept appears when research and development are conducted in highly realistic sensation. I feel the expression that the systems are incorporated in the form of fusion with movies should be included in the concept of how the highly realistic sensation system is used in Chapter 3.

Moreover, as for the safety and security part, I think the copyright issue has been pointed out in that section. For the copyright part, the viewpoint of promoting secondary use is important. Of course, that is right. The Secretariat understands that the part of introducing so-called request broadcasting has been placed in the ubiquitous section or section of integrating communication with broadcasting. I think it should be described more clearly. As for personal broadcasting or personal originator broadcasting, only security is spotlighted. I think how it is described in the text is a matter of consideration. It is written in the paragraph on collaboration with communication and broadcasting. I feel that part of it is incorporated in the deployment in collaboration with communication and broadcasting in regard to broadcasting technology for a limited purpose or a technical part. I think the matter will be described across chapters by enhancing this part. As for this, I would like to have more comments from you to reflect their improvements in the final report. That concludes my speech.

[Ezaki] I am Ezaki from Tokyo University. I agree with Mr. Sato's opinion. I think it should be clearly described. Judging from the Secretariat's comments, they are going to incorporate the suggestions into the text. I understand there is a temporal restriction, but I feel they should make another independent chapter. In respect to secondary use, a creative commons issue or something is involved in it. I probably understand the comment that you should express something clearly because the freedom of expression and the press has a great impact at all events, so in the "Other of Today" section, they have discussed accumulated technology in terms of the idea of copyright and freedom of expression. I think something else is a very big trend of recent several years and has a big impact. Moreover, I think there is one more important thing about the viewing rate. Concerning the discussions mentioned herein, I do not know how many people watch YouTube. Maybe nobody knows a real life, I suppose.

When I talk to my students, they say they do not watch television. They say YouTube suffices for them. I do not know how far this permeates our society, but nobody has data. This may be a problem. This is true for other committees. Actually, nobody in the field has

the data for making a very important policy. In spite of the committee for talking about next generation, nobody understands the present time. I think taking data as a policy should be listed as an issue because it is closely related to a viewing rate.

[Sato] As for YouTube, I think people talk only about copyright infringement through ordinary discussions. In my class, however, I show something from YouTube using iPod because I have good software for converting YouTube video clips into iPod. I bring my iPod only to my classroom. I find about 10 video clips from YouTube and put them into my iPod. In short, I can make what I need, without using a player. I think the combination of YouTube and iPod changes behavior considerably. In an ordinary place, most people say YouTube is not good for copyright protection. However, I think Mr. Ezaki's comment is important.

[Ezaki] I was aware of one more thing when I went to a foreign country. On overseas television, YouTube credits appear during a broadcast program as they are. I think this is probably fairly illegal in terms of Broadcast Law, but it is true that YouTube images are seen on overseas television as they are.

With regard to whether this is good or bad, I understand that you should not show such images in a public place. It is, however, necessary to check out the real condition. I think this is very important data when bringing discussions into the next phase.

[Harashima] Please.

[Yokoi] Basically, it is important to judge how you recognize originality. You can make a compilation by editing and connecting ready-made articles properly for your own convenience.

Though I do not necessarily reject making personal entertainment or an interesting story for a specific group, I would like to basically ask you how you handle the value of originality that can produce something by picking out and connecting only usable parts of original works.

I think it is wrong to establish such an information society unless they basically consider how they actually handle the value of such originality or labor in the atmosphere where anything can be done from a technical viewpoint.

Why do you use the two words, "broadcasting" and "communication"? I think this matter was discussed considerably earlier. The basic concept of broadcasting is to provide information to the general public inexpensively for rich and poor alike. Communication is a

basic idea of communicating what you want to communicate. It is true that you can do anything using communication as a tool. I am rather a technology-first person who sees things from a technological standpoint, but broadcasting depends considerably on the governmental broadcasting system in a sense.

In some foreign countries, YouTube is left alone. Some may argue about why it is handled in a different manner. I know there are various discussions of YouTube. Including that, I think it is reasonable to distinguish between technology and systems from a different viewpoint.

[Ezaki] I think you probably do not understand my points sufficiently. You have to do it right to establish policies that can respond to the reality in our country, and this can be available only after figuring out what is happening abroad. If you had no fundamental, true information to be discussed, any discussion would be biased. We recognize that it is very important to discuss how to secure copyright holders' rights. One of my points is that it is a serious problem if you have no basic real data at hand when you want to know what is going on around you and what policy you want to make.

[Harashima] Go ahead, please.

[Kishigami] I am Kishigami, and I am attending these meeting as a successor to Mr. Ogawa from now on. I am in charge of IPTV or IP retransmission in NTT. As a manager, I would like to suggest one thing to do. Including ITU-T, IPTV standardization has been widely discussed inside and outside Japan. In particular, people have begun to use the word QoE when talking about this topic in the ITU-T field. This means Quality of Experience, which is likely to have come from user experience in overseas IT industries, as you know. In short, there are various expressions, such as user friendliness when a user uses a service, or "kindness for others or comfort" as explained today. As some things that can be measured technically to some degree, those are, used in the word QoE, such as zapping speed or easy-to-use remote controller. I do not use such words because they are used in a variety of discussions from a user standpoint. Seeing this, I feel there is something that is easy to understand by means of such compilation. Dare I introduce it, I suggest that there might be something that is easier to understand through the use of such a viewpoint.

[Harashima] Thank you very much.

I think you have much to say and I have very important suggestions. I would like to reflect a lot of suggestions gradually. We do not have enough time. So, please introduce general

questionnaires about what you expect for next-generation broadcasting.

[Tomoki Takahashi] Well, I would like to introduce next-generation questionnaires. Please look at document 5-4.

On page 1, this questionnaire shows what demands users have regarding broadcasting services suggested at the study group or how users view broadcasting services. We asked the members of the National Association of Consumer Consultants for cooperation, as well as general viewers.

I would like to take this opportunity to thank you for your cooperation. The technique is a web questionnaire invited from the middle of March until the end of that month. We received answers from 1,014 people. The questions are as follows:

The basic attributes of the users who answered the questions are shown on page 2. The answers were collected and distributed on a sex and age basis, on the average from men and women, and almost on the average in age. We collect the answers from teenagers to aged people almost constantly. The youngest respondent was a 7-year-old child.

On page 3, the questionnaire shows what kind of broadcasting service these people view on the average. Basically, these are general answers. The blue bar shows what respondents are viewing: Terrestrial analog broadcasting accounts for the highest percentage. The result shows that many people still listen to FM and AM radio programs. Number 4 is BS analog broadcasting. CATV, terrestrial digital broadcasting and Internet broadcasting then follow. Talking about mobile phones, one-segment broadcasting accounts for 8.8% according to this questionnaire. My impression is that the percentage is considerably high and has been going up.

As for what kind of broadcasting you want to watch or what kind of broadcasting service you want to take, the rate at which people want to use terrestrial digital broadcasting is extremely high, accounting for 77.8%. Then, BS digital broadcasting and Internet broadcasting also have extremely high percentages, followed by one-segment broadcasting. Regarding what kind of audio-visual device you have at home, CRT-based television ranks at the top. Car radio, LCD television, desktop personal computer and radio-cassette recorder follow. Conventional equipment still accounts for a high percentage, not recent digital appliances.

The next question that general audience answered is what idea is actually suggested regarding next-generation systems or what demands the respondents have.

Due to the phrases being too long, I sorted them into the following keywords. Please look at these definitions and please see page 5 to confirm what demand each respondent has.

Actually, the content of the questionnaire is classified roughly into three parts: future

television equipped with advanced intelligence relating to a hyper-intelligent receiver, mobile terminals, and highly realistic sensation television. The questionnaire asks respondents about each individual function. Seeing this, the demand for future mobile terminal and highly realistic sensation television falls under the orange-colored portion showing “absolutely necessary.” Starting with 3D image + stereophony, more than 50% of the respondents reflect a high demand for such devices, including five-sense broadcasting and free viewpoint.

There was high demand for future mobile terminals because the emergency startup to provide disaster information was easy to understand, as explained previously.

The final questionnaire is the actual result of free-style description with regard to what kind of broadcasting you want. It includes stereoscopic television, 3D television, VR/highly realistic sensation television, simple operation, eye-contact recordable television, etc. Most of the answers were about improvement in operability. In addition, the needs for ubiquitous computing and on-demand programmable television ranked high as well.

As for five-sense broadcasting, there were many answers because the item was in the questionnaire. Smell was also of growing interest. It was a surprising result.

The resultant order of free-style description in the questionnaire is as shown here. “Satisfied with the status quo” is listed near the end. We received answers from 1,014 people.

That is all.

[Harashima] Thank you very much.

Do you have any questions about this?

Generally speaking, equipment with advanced intelligence is not all that in good order.

Some people are not happy with such devices that recognize their intention automatically.

They want to have control by themselves.

[Kobayashi] I think these results would be obtained in the current situation or state of broadcasting services. It is unexpected to me that a considerable number of people are listening to radio. As I probably mentioned at the first meeting, judging from this report, I feel it is too biased toward television. I said to my wife as I was leaving, “I am going to talk about next-generation broadcasting.” And my wife said to me, “Please keep the radio for listening at any time.” In particular, considering many things, including emergency and disaster measures, AM radio would be continuously used. In other words, we should continue to remember AM radio. I think advanced equipment will develop in turn. In terms of equality, I especially feel that AM radio will continue to be used as one of major media. I have other comments but no more for today, thank you.

[Harashima] Recently, I have been taking a midnight taxi home almost every day. I often listen to the late-night radio program called “Radio Shinyabin.” Personally, I think it is great media.

Is that OK?

It is now time to close the meeting. To tell the truth, I have much to discuss and would like to continue the discussions longer, but we started a little bit early, so I am going to close today’s meeting. I would like you to take a variety of opportunities to present your comments.

In addition, I would like you to continuously consider whether some message should be issued as an overall conclusion. I think technological items are extremely detailed by dint of the engineers’ efforts. I consider that we will have to discuss how to use those items more carefully.

As I asked a little bit previously, will the Secretariat please explain the future schedule?

[Kondo] As Mr. Harashima pointed out, we think we will invite public comment for about one month following the end of Golden Week, and compile a report at the end of June and release it. In response to today’s meeting, we are going to compile a draft report for public comment.

However, the draft report for public comment is not positioned as one that is under discussion, nor as one that has been completely authorized in the study group. We are sorry for our immediate request. As for this draft, we would like to invite some comments from you by April 25, even though we only have one week.

We would first like to reflect your minimum comments in the report. Then, we are going to start inviting public comment after the end of Golden Week in May. On the other hand, we would like to have more comments from members in a second-stage following the public comment. After that, we plan to compile your comments and the public comment results to produce a final report at the end of June. Please understand our schedule. We would like to adjust June’s meeting schedule separately with you.

[Harashima] Thank you very much.

I think and understand that public comment is invited to reflect and aggressively utilize various opinions in the final report by showing what has been compiled to an interim stage, rather than to seek opinions only because a draft report has been completed. I think the meaning of public comment significantly depends on its characteristics.

[Okubo] That is right.

[Harashima] I would like to interpret public comment in the sense of various opinions including a direction to follow, not opinions following the determination of such direction. I would also like to receive more comments from all of you continuously.

Sorry, I took a little bit too long. With that, we come to the end of the fifth meeting. Thank you very much.