

WBU-ISOG FORUM

Wednesday, April 30, 2014

Hosted by NHK

Keio Plaza Hotel
Ohgi Conference Room, South Tower, 4th Floor
2-2-1 Nishi-Shinjuku
Shinjuku-ku, Tokyo, 160-8330
JAPAN

SUMMARY NOTES (Draft)

Participants:

Please see the WBU-ISOG Forum Registration List.

Presentations:

The Forum Agenda and presentations (with the exception of those containing proprietary information) are available for public viewing and downloading at: <http://isog.worldbroadcastingunions.org>

2.0 WELCOME REMARKS

WBU-ISOG Interim Chair Akira Ogawa welcomed attendees to the second day of the Forum, noting that the afternoon sessions would take place at the NHK Science & Technology Research Laboratories and would feature video demonstrations of 8K Super Hi-Vision video and audio. He also thanked the co-sponsors (KDDI, SKY Perfect JSAT and SoftBank) of the previous evening's dinner.

2.1 INTERFERENCE UPDATE: LATEST THREATS, LATEST DEVELOPMENTS

Moderator Abdelrahim Suleiman (ASBU) introduced the first morning session, noting it would focus on actions and progress with respect to the ASBU Satellite Interference Action Plan, which had been fully endorsed by those present at the WBU-ISOG Rio de Janeiro Forum in November 2013.

The five panelists were Yvon Henri (ITU), Rick Abbasi (Intelsat), Jeff Watts (SES), Yassir Hassan (Arabsat), and Yoshinobu Ogawa (SKY Perfect JSAT). They addressed such topics as: the ITU regulatory framework as it relates to interference; metrics on the causes of interference events and the steps satellite operators and ITU are taking to mitigate these issues; and, actions that Forum attendees can take to assist with mitigation efforts.

Some of the key messages conveyed included the following:

- There is no distinction between intentional and unintentional interference in the ITU Radio Regulations, but this can be changed by Member States at the World Radiocommunication Conference (WRC).
- Human error, including misaligned equipment, is still causing the majority of interference events. This underscores the ongoing need to participate in training and certification initiatives.
- Carrier ID needs to be implemented across the board, with DVB-CID being the permanent solution as time goes on. Type approvals are important as well.
- Solving interference issues is going to require participation and continuing cooperation with such associations as the Satellite Interference Reduction Group (sIRG), the Global VSAT Forum (GVF), the Space Data Association (SDA), and the Asia-Pacific Satellite Communications Council (APSCC).
- WRC-15 Agenda Item 1.1 will consider additional spectrum for International Mobile Telecommunications (IMT) and other mobile broadband applications, and C-band is on the menu. Steps that will assist in efforts to protect C-band include the following: register your

earth stations with local regulators and the ITU; be heard – tell the ITU you use C-band; and, lobby your regulator.

In discussion, Tom Gibbon (NHK) inquired about the responses of satellite operators to the intentional interference (jamming) that had been referenced during the Arabsat presentation. Y. Hassan said the first step is to identify the source of interference and verify that it is intentional, adding that normally, interference of this type will be on a CW carrier. Next, the customer is informed and geolocation begins. He noted as well that Arabsat usually does not compensate the customer when jamming occurs, because it is beyond the satellite operator's control. J. Watts indicated that additional steps, while one is geolocating, might include increasing the power on the affected carrier and adding padding in the transponder, which may overdrive the interferer in some cases. R. Abbasi outlined similar technical steps that Intelsat would take in these situations, and responded to further probing from T. Gibbon by stating that typically interference of this type is treated as a "force majeure," and if customers want it to be treated otherwise, they should discuss this with their Account Director. As a point of information, Mark Rawlins (Eutelsat) advised that the European Satellite Operators Association (ESOA) had published a Best Practices document that deals with processes to address deliberate interference.

Martin Coleman (sIRG) observed that intentional interference is often politically motivated and tends to be targeted towards services like the BBC and Voice of America, noting that this opens up a heated debate about whether one should put content into multiplex carriers that could cause trouble. He also remarked that what is happening to Arabsat and Eutelsat in the MENA region now will probably happen elsewhere in the future as the world's troubles sadly move around the planet.

Nigel Fry commented on BBC's strong desire to protect its editorial content, citing this as a motivator to work closely with the satellite industry to negotiate a different set of terms and conditions relating to actions that follow intentional interference to a service. The quid pro quo is that BBC also works actively with the industry towards implementation of technical and regulatory changes. N. Fry also said he was glad to hear of the APSCC activity and asked if there are any links between the Council and the SDA.

In reply, Y. Ogawa said there was no link between these organizations at the moment, adding that he believed most Asian satellite operators were not aware of SDA or sIRG. He also noted that there is no fee for satellite operators to join the APSCC interference mitigation forum. The APSCC is a non-profit organization that promotes satellite usage for communications and broadcasting and, working together to seek cooperation among Asian satellite operators, which makes it easier for satellite operators to participate.

2.2 DEALING WITH INTERFERENCE – WHERE NEXT?

In his dual role as moderator and panelist, Nigel Fry provided context for the session by describing the steps BBC is taking with regard to deliberate interference and protection of spectrum during what he characterized as a time of "industry transformation." He also challenged those present to undertake their own actions plans (e.g., support the Satellite Spectrum Initiative, prepare for WRC-15, start using carrier ID, etc.).

This call to action was echoed by the three panelists who followed. Mark Rawlins (Eutelsat) outlined the mission of the Space Data Association (SDA), its RFI functions, the role of the Space Data Center, and the reasons satellite operators should become members (e.g., faster resolution of problems, less manpower required to achieve the same result, high precision when looking for geolocalisation sets, etc.).

Next, Martin Coleman (sIRG) shared details about the status and timelines for implementation of carrier ID and made a number of suggestions for further action, including the following:

- WBU-ISOG could perhaps do a survey of broadcasting Unions to find out who has CID (NIT or DVB), who is requiring it (e.g., commercial/industry) and what planning is being done.
- The ASBU Action Plan should be picked up by each Union, reinvented to suit regional situations and then implemented (not only carrier ID, but also Type approvals, etc.)

He noted as well that the Radio Frequency Interference End Users Initiative (formerly RFI-EUI, but now called simply EUI) had become part of sIRG, and said he would like to see end users groups established in all regions. He finished by urging everyone to “Turn on your carrier ID!”

The title of the presentation from Rick Abbasi (Intelsat) was “The Gloves are Off.” It described a global effort – coordinated by the Global VSAT Forum (GVF) on behalf of the Satellite Spectrum Initiative (SSI), with leadership from regional partners (e.g., CASBAA, APSCC, ESOA, etc.) – to fight threats to spectrum (especially C-band) in the lead up to WRC-15. Key elements of the campaign include the following:

- Collecting detailed information about the extent of deployment of satellite receive-only terminals and encouraging terminal registration.
- Challenging the over-inflated IMT assumptions on spectrum needs.
- Demonstrating that sharing is not feasible due to the separation distances required.
- Showcasing the importance of satellite services and seeking support from allied interests (e.g., humanitarian groups, military, inter-governmental agencies, etc.)

In discussion, it was noted that CASBAA was engaging consultants to provide data on deployment of receive-only terminals in Asia, while the European contribution to the SSI effort was the study commissioned by ESOA (and carried out by LS Telecom) providing data on the over-calculation of the mobile phone industry spectrum requirements.

Andrew Steele (BBC) observed that the mobile industry is expected to mount a massive lobby and wondered if this could be matched. N. Fry said the satellite industry was coming from behind on this but was getting its act together. R. Abbasi acknowledged that the wireless industry has a lot of money behind its push for extra spectrum, which is why regulators need to be made aware of the extent to which the population is using earth stations. M. Rawlins commented that Eutelsat’s CEO is coordinating the activity that had resulted in the LS document, adding that this activity will remain a priority in the build up to WRC-15.

Y. Henri emphasized the importance of registering existing C-band earth stations with the ITU. On the matter of DTH stations which are using C-band, he suggested that satellite proponents should ask ITU, through their administrations, for international recognition and protection to show the importance of C-band applications. N. Fry considered this to be a plea to broadcasters to get pro forma letters ready to send to administrations in their respective countries, particularly across Asia and Africa where C-band is very important as a means of delivery.

Regarding the call to action with respect to lobbying, Guy Cheney (Law Office of Thomas Gibbon/NHK), wondered if Japan has been helpful in the past and whether it would be advisable for NHK to engage with the regulator to protect its mission of emergency communication in times of disaster. R. Abbasi replied that Japan was one of the administrations that reserved its position on the use of the lower C-band for wireless services, adding that it may not be important to them from a national perspective because much of the satellite communication in Japan is Ku band; however, where it does affect Japan is in the delivery of Japanese content to the rest of the world, so it is important that the broadcaster bring this to the regulator’s attention.

N. Fry reflected on this last comment, noting that the UK administration tends to look at issues from the point of view of the national situation, rather than from the value to the country of its exports (including broadcasting). Therefore, part of what BBC is undertaking at the moment is trying to bring home to the regulator that when formulating its position, it should also consider the value of this spectrum that is outside the UK.

2.3 ULTRA HD – ASIA PERSPECTIVE: PLANS & PROSPECTS

This session, which took place at the NHK Science & Technology Research Laboratories, provided participants with extraordinary views of 8K video, which, judging by the “oohs and ahhs” heard throughout the demonstrations, succeeded in dazzling the audience.

But before the viewing took place, Yoichi Suzuki (NHK) introduced the transmission system for 8K Super Hi-Vision satellite broadcasting, including the requirements (e.g., target capacity of about 100 Mbps in a single transponder, capable of receiving using a 45-cm dish antenna, etc.) and details related to such matters as input format, modulation, symbol rate, roll-off rate, etc. He also shared the results of transmission verification tests done in January 2014 (with the cooperation of SKY Perfect JSAT and B-SAT), which demonstrated that 100-Mbps transmission is feasible in both CS and BS. Insofar as future work is concerned, Y. Suzuki referred to the possibility of national and international standardization through an ARIB Standard and an ITU-R Recommendation. In a brief Q&A session, he also addressed queries about the bandwidth occupied during the verification tests (34.5MHz) and other technical issues (roll-off, receive antenna, etc.).

Next, Takashi Kume (NHK) described his role as Technical Director in charge of 8K production for the Sochi Olympics, noting that Super Hi-Vision is not only about the pictures, but also about the immersive, 3D sound experience that comes with 22.2 audio. After outlining the Sochi events produced in 8K (opening and closing ceremonies, and figure skating), T. Kume explained the way the 8k cameras were positioned for the best advantage so that the images would not potentially make viewers sick, and shared many other technical details, including the way NHK captured slow motion video of figure skating using a 4K super slow camera at 300 frames per second (an 8K super slow camera has not yet been developed).

In addition to showcasing the Olympic videos, he also played 8K video from the 2013 Confederation Cup in Brazil, and announced NHK's 8K plans for the 2014 World Cup (covering 5 venues and 8 competitions). The events will be recorded, but NHK will also transmit pictures live to Japan (via satellite) and Brazil.

In a brief discussion on possible confusion related to having various names for 8K, it was noted that ITU-R Recommendation BT.2020 defines two resolutions of UHDTV, with UHDTV-1 being 4K and UHDTV-2 being 8K. In Japan, however, 8K is known as Super Hi-Vision.

The final presenter, Haruyuki Moroishi (NHK) stated that his role was to produce large-scale videos that are screened mainly at exhibits and expos, and in describing his work, he highlighted the synergistic relationship between content and hardware as both evolve. For example, he noted the type of content that maximizes the potential of 8K and 22.2 sound is nature, animals, architecture, festivals and sports events, much of which was on display in his 10-minute video called "Gift for the Future," which was shot with a 20kg 8K camera. To illustrate the way technological innovation can push boundaries in creative story-telling, he screened a video ("Move!") shot with a 2kg 8K compact camera, noting that through mobility, the images aimed to create "the sensation of feeling as though you have been sucked into the program and are experiencing everything with the protagonist who time warps to different worlds."

H. Moroishi concluded by announcing details about NHK's 8K Super Hi-Vision road map, including trial broadcasting of the Rio de Janeiro 2016 Olympics, and broadcasting of the Tokyo 2020 Olympics. WBU-ISOG Forum attendees gave enthusiastic applause to the NHK representatives who had taken part in this exciting session.

2.4 HEVC AND DVB-S2X – STANDARDS & DEVELOPMENTS UPDATE

In the final session of the WBU-ISOG Forum, attendees were treated to highly technical, information-rich presentations on latest developments related to HEVC and DVB-S2X, including: important functionalities and the benefits these provide; the status of standardization initiatives; and, the impact they are having on the design of satellite transmission networks.

Vlastimil Benovsky (Eurovision, EBU) moderated the session and also acted as a panelist, along with Masataka Tsuchiya (NTT Electronics), Claude Stoffel (ATEME), Steven Soenens (Newtec), and Rick Abbasi (Intelsat). They outlined particulars related to such matters as their companies' contributions to

development and standardization efforts, various product offerings and solutions, and strategies going forward. The panelists also conveyed some general conclusions, including the following:

From NTT Electronics:

- HEVC is the key technology for efficient transmission over the limited bandwidth circuit.
- MPEG-2 (part 10) no longer fits the current requirements of broadcasters. Applying MPEG-H MMT realizes advanced service and operation.
- IP transmission is gradually replacing existing ASI-based transmission. LDGM will replace Pro-MPEG and will gain more robustness.

From ATEME

- With respect to files, HEVC is driven by 4K and OTT applications (Netflix, Samsung HUD Pack, etc.). There is also strong interest from Telcos, driven by 4K (IPTV). HEVC is not driven by mobile application, and in fact, is not supported by Apple.
- Regarding live, it appeared at the NAB Show that there are more potential vendors than real opportunities. It is driven by sporting events, and projects are in the works using Contribution in quad HD and distribution in HEVC (with STBs planned for the end of 2014).

From Newtec

- Open standards, like DVB-S2X (with the “X” representing “extension”), are a key driver to broadcaster success.
- Examples of the beneficial changes offered by DVB-S2X include lower roll offs, more granularity, extended SNR range top, linear channel optimizations, additional Standard scrambling sequences, channel bonding, and extended SNR range bottom.

From Intelsat

- The availability of HEVC and DVB-S2X will facilitate trials and early implementation of UHD TV services. HEVC is critical to reducing the transmission rates for UHD TV, while DVB-S2X is a useful enhancement to DVB-S2 which provides support for higher transmission rates.
- DVB-S2X compatible modems are expected to need next generation satellites to fully exploit the throughput capabilities of 128 and 256 APSK modulation schemes.

From Eurovision (EBU)

- The impact of HEVC and DVB-S2X has led to the decision that the design of the satellite network must be based on MCPCs (“It’s the only way.”)
- In Europe, EBU is going to launch a 72 MHz transponder and will be running 200 megabits through it. The Eurovision network is a Contribution satellite network, but is designed in a way that is similar to direct-to-home networks.

In discussion, Martin Coleman (sIRG) referred to the use case in Egypt described by S. Soenens, and wondered whether interference reduction might be another application for using DVB-S2X. S. Soenens replied that the new modulation schemes require a better way of compensating amplitude and phase impacts on the signals, so in parallel to the new standards implementation, at least half the team at Newtec is working on advanced pre-distortion technology that goes together with the new standards, as well as post-compensation on the receive side. M. Coleman indicated that sIRG has been looking at ways to be smarter on the receiver side (e.g., “smart filtering”) to prevent interference. R. Abbasi observed that some of the next generation satellites will have some ability to block uplink interference, which, when coupled with receiver improvements being talked about, will provide answers to this problem. S. Soenens stated that the new standard has the ability to transmit signals with different quality levels, adding that this is another measure that will help to address interference.

After thanking his fellow panelists, V. Benovsky ended the session by inviting all present to attend the November 2014 WBU-ISOG Forum, to be hosted by EBU in Geneva. He noted as well that it would

be difficult for EBU to compete with the marvelous way that NHK had organized and hosted the Tokyo Forum.

CLOSING REMARKS AND ANNOUNCEMENTS

In his closing remarks, WBU-ISOG Interim Chair Akira Ogawa commented on how much he had learned during the past two days and gave thanks to everyone who had contributed to the Forum's success, including: the delegates who had attended; the presenters; the translators; his many NHK colleagues who had devoted so many hours to organizational matters; the companies that had sponsored meals, including AsiaSat, Inmarsat, Intelsat, SES, SKY Perfect JSAT, KDDI, SoftBank Telecom, and Akamai; and, the WBU Secretariat's Anh Ngo, who was praised for having done all of the groundwork.

He then wished all a safe journey home, said he hoped to see them in November in Geneva, and officially closed the WBU-ISOG Tokyo Forum.

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