A Report Regarding the SATELLITE 2019 Conference & Exhibition

May 30, 2019

Written by Shigeki Kuzuoka

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Abstract

The SATELLITE 2019 Conference & Exhibition was held at the Walter E. Washington Convention Center located in Washington D.C., U.S., from May 6 (Monday) to May 9 (Thursday), 2019. This event covers mainly OldSpace-related companies and organizations involved in geostationary communications satellites, along with other space-related companies that are widely known. However, these days, many persons involved in firms operating in the NewSpace arena are coming to this event, and therefore, it feels that this event has been transforming a bit into an event that covers overall subjects involving Earth observation and the surveillance of space debris. Despite this, judging from the attendees and the exhibitions made this time, one can say for sure that this event is still covering traditional communications satellites that belong in the OldSpace domain.

Interestingly, one thing that the author did notice was the number of attendees wearing ties. At an event held in Silicon Valley dealing in matters related to NewSpace, only a few persons wore suits and ties. However, at this event, most of the attendees were wearing suits, and half of these were wearing ties. About 80% of the presenters at this event were wearing ties.

All that aside, in total, more than 15,000 persons from 105 countries gathered at this event, and 340 companies/organizations gave presentations. It can thus be said that this is the biggest satellite-related conference in the world.

Meanwhile, usually this event is held at the end of March; however, this time it was held in May. In additional info to note, this event was hosted by the Satellite Group, which is a media company focusing on space business and which publishes the magazine, Via Satellite.

Impressions

Many discussions were held during the numerous sessions at this event. The main theme among these discussions entailed what sort of trends will occur in the satellite communications industry. Historically, the geostationary communications satellite market has produced orders for more than 20 satellites on a yearly basis; however, over the past two years, the market has only seen the ordering of eight satellites per year. For everyone in the business of communications satellites, the questions are: For how long will this stagnation continue? And what new trends will emerge in the future?

The author had the chance to engage in discussions with many acquaintances and was able to participate in the event's many presentations. The following information consists of the personal views of the author as experienced during this event.

Historically, the operators of satellite communications sell the capacities of satellite-borne communications transponders to value-added carriers, such as to maritime communications companies and internet providers for aircraft, and each value-added carrier provides their own accommodative services to customers. Most of the attendees share the common recognition in questioning whether these existing business models can survive in the face of new services, such as 5G communications and IoT/automated driving, being realized in the near future. Now, it seems, communications satellite manufacturers are facing a turning point. Regarding technical aspects, it is now necessary to face the circumstances of new technologies, such as high-throughput satellites (HTSs), circular-orbit satellite constellations (OneWeb and Telesat), high-altitude pseudo satellites (HAPSs), and space refuelers (which aim to aid in the extension of the lifetimes of satellites), along

with to what degree these will be realized in the near future. Under these business circumstances, it seems that communications satellite operators face some difficulties in making their decisions regarding which new technology to focus on in their own business in the future. This is the reason why operators have postponed their procurement orders for new geostationary communications satellites—they are holding off for now.

Based on the assumption of business success as created by circular-orbit communications satellite constellations, which will move into full swing by 2021, it can be assumed that the number of orders for geostationary communications satellites will not recover to the level of maturity seen in the past. The author has had conversations with a number of satellite operators, and they have had uttered the keyword "flexibility" as a requirement for business in the future. In the existing geostationary satellite industry, about three years are required for manufacturing, while 15 years are required as satellite lifetime after launching. This means that the operator has to predict what the business environment will look like in the coming 18 years after an order for a satellite is made. One can say for sure that such a prediction is quite difficult to make regarding any order for a geostationary communications satellite while precisely grasping what will occur in the industry nearly 20 years after an order is made, especially under a circumstance where the business environments and the usable technologies have been drastically changing, as in nowadays. Due to these reasons, a number of operators have expressed strong demand for flexible technologies that enable changes in satellite functions and performance as according to changes occurring in the business environment.

However, there are many ways to realize flexibility. One methodology is by using a software-defined radio (SDR), which enables changes to frequencies and modulation methods within a communications payload during a satellite's operations, via a software program. This methodology is a variant of an HTS, and the communications payload accommodating the SDR methodology is referred to as a "flexible payload."

Another methodology is to use a satellite constellation consisting of smaller circular-orbit satellites in which it would be easy to realize a change in the satellite’s overall communications function. The version upgrading of an overall communications function in such a constellation can be realized by adding new satellites accommodating the newly required communications performance.

As described above, many new requirements from satellite operators have been voiced; however, there are a few related subjects that the author could not comprehend so well. The

first one is: At what time point and at what opportunity should a change of communications performance be carried out?

For example, an HTS has the capability of changing the beam foot-print, made via narrow-beam antennas, in accordance with the customer's demand, for a communications capacity in each service region. However, the author wondered in what business, as well as in what sort of change of circumstances in business, the beam foot-print should be changed? For example, during the times of Olympic games, the demand for communications volume will be increased temporarily in specific regions, and the narrow antenna beams of an HTS will be pointed at these regions. However, the question is: To what regions shall these beams be pointed at after the Olympics games are over? Demand for communications differs between day and night, and therefore, changes to communications traffic patterns are occurring. However, can it be said that it is realistic to change the beam service regions every day and every night? The author has asked these types of questions to many satellite operators only to not yet get a comprehensive answer. One example that the author could comprehend is usage for maritime communications. Nowadays, large-scale terminal ports have been established, and the requirements for changing the beams have been raised in the case where changes in sea routes have occurred.

HTSs have also been launched. However, there is no established way of using these HTSs in business matters, and therefore, related studies are required. Furthermore, as mentioned above, flexible payload methodology has been developed in order to cope with changes in business models, along with changes in communications systems. However, unless operators comprehend these flexible satellite communications technologies, the satellite communications industry cannot progress to new stages and would have to remain in "wait and see" mode.

Speeches and Discussions

(1) Keynote Speech from U.S. Vice President mike Pence

(2) Geostationary Communications Satellites

(3) Circular-Orbit Communication Satellites

(4) Ground terminals and ground stations

TEL: +81-80-2052-1348

Euroconsult Japan Office

http://www.euroconsult-ec.com

E-mail: shigeki.kuzuoka@euroconsult-jp.com

TEL: +81-80-2052-1348

Other Miscellaneous Comments

The author visited Baltimore last April, but could not enjoy the side benefit of the visit of being able to dine on soft-shell crab, as the soft-shell crab season had not come yet, at that time. During this visit to Washington D.C., however, the author could find some soft-shell crab dishes on the menus of some Chinese restaurants. This was a big chance for the author! The author was able to get some soft-shell crab in Chinese style, sautéed with common and Welsh onions. The taste of this Chinese style of soft-shell crab cuisine was different than the more-familiar American type, but regardless, it was finally possible for the author to enjoy the beauty of soft-shell crab paired with beer.

If you have any questions regarding this document, please contact:

Shigeki Kuzuoka

Satellite Business Network

http://sat-biznet.com

E-mail: shigeki-kuzuoka@sat-biznet.com