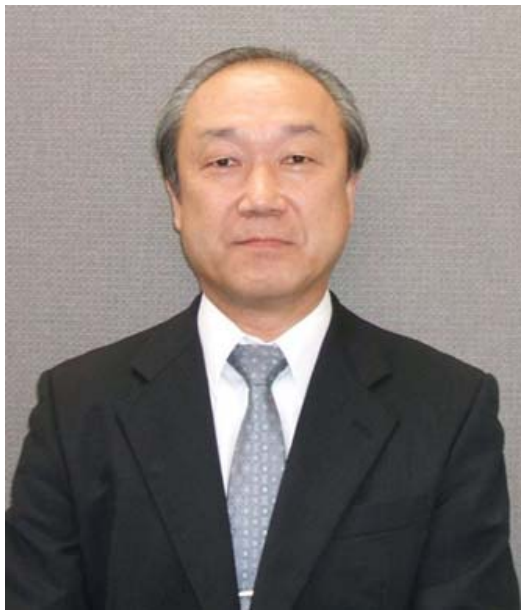
INTERVIEW WITH CEO



Mr. Susumu Yamaguchi

President and CEO, NEC TOSHIBA Space Systems, LTD. Tokyo Japan

In our interview, NEC TOSHIBA Space Systems (NTSpace) President Mr. Susumu Yamaguchi speaks passionately about his business strategies for worldwide satellite communications in all of frequency band for broadband applications.

Space Japan Review (SJR): Thank you for taking time from your busy schedule for this interview. We appreciate the contribution you've made to AIAA-JFSC. Space Japan Review (SJR) is a technical communications journal published by AIAA Japan Forum on Satellite Communications (AIAA-JFSC), a subcommittee of the American Institute of Aeronautics and Astronautics (AIAA)'s Technical Committee on Communication Systems (TCCS). It was initially published in hard copy, but is now distributed electronically over the Internet. This column provides an opportunity for CEOs of communications satellite development and manufacturing companies and satellite communications providers around the world to discuss their strategies and aspirations, serving as a reference for AIAA members and SJR readers. NTSpace was established over 13 years ago. Today we'd like to discuss your strategies for the satellite communications System Japan and worldwide.

SJR: First of all, please give us a quick background on yourself and NTSpace and an overview of your strategies.

S. Yamaguchi: I graduated from the electrical and electronic master degree of Yokohama National University in 1978. Then I joined NEC to develop the satellite transponder equipment such as the transmitter, frequency converter and TWTA etc. and have been working more than 35 years for many domestic and overseas projects. NEC and Toshiba merged their space business areas and established NTSpace as a joint venture company in 2001. Moreover NTSpace moved the business of the satellite system design and the whole responsibility of the ground control station to NEC Space Systems Division which was re-organized on 2007. Therefore at the present time NTSpace is responsible for the satellite subsystem/equipment design and the manufacturing of the whole satellite system/subsystem/equipment. I have promoted to the president of NTSpace in 2011 and now the goal of NTSpace is to be a top company of the manufacturing for the satellite system equipment in the world.

SJR: As you stated, NTSpace started over 13 years ago as the joint venture company for the space business of NEC and Toshiba Corporation. Microwave equipment development manufacturer for satellite communication especially space qualified microwave device like filter, multiplexers, am-

plifier and satellite main body. It seems you now have a unique mission of “making space technology more affordable, accessible and useful to millions of people on Earth” through your satellite onboard equipment and satellite main body. What is your policy and strategy of business development in this field?

S. Yamaguchi: NTSpace has developed the satellite system and equipment with the corporate philosophy that NTSpace contributes to realization of secure and safe society by using the technology of the satellite system and its application. It is well-known that the scientific satellite "Hayabusa" which was launched in 2003, achieved the sample return of the asteroid “Itokawa”, and returned successfully to the earth in 2010 greatly encouraged Japanese people. Moreover, when the Great East Japan Earthquake was occurred in 2011, the earth observation satellite ”Daichi” launched in 2006 observed the disaster situation promptly and the Wideband InterNetworking engineering test and Demonstration Satellite (WINDS) "KIZUNA" launched in 2008 made the satellite telephone possible to complement the land-based communication line of the stricken area. These satellites were developed by NTSpace. Now although NEC Space Systems Division is bearing satellite systems development and NTSpace is in a position which supports as a consolidated entity, the soul to achieve the social mission has not changed.

SJR: How do you expand your business fields? What is your strategy to taking them into your company for both development activity and business proceeding?

NEC Space Systems Division works mainly and actively to expand the business of the satellite system, NTSpace challenges to provide the more competitive products in both of bus equipment and mission equipment. Moreover, about an overseas equipment market, since it is also a core of the enterprise of NTSpace, the continuous investment is being done so that the development of the product should be matched to the needs of our customer which would be taken in advance.

SJR: Could you introduce the main performance advantage of sophisticated satellite onboard equipment and satellite main body including millimeter wave and optical which your company could supply, and how do you expand your capability for markets worldwide?

5000 or more onboard equipment made by NTSpace have been used for 250 or more satellites all over the world. Although the market competition of the onboard equipment business is very hard, NTSpace is challenging the business bearing “reliability first and quality first” in mind in order to permeate NTSpace brand. As a result, we received the voice of the customer that the performance of NTSpace was good and there was no fault after delivery.

Moreover, about the satellite system, NTSpace is manufacturing the small satellite standard bus NEXTAR currently developed by NEC. NEXTAR has the main performance of the total mass of 400 kg including the mission loading mass of 200 kg, and the mission allowable power of 300W. The scientific satellite “HISAKI” launched in 2013 and "ASNARO-1" to be launched in the current fiscal year are one of the series of this NEXTAR. Based on this heritage, we would like to develop an overseas market of the satellite.

SJR: What gave you energy to succeed in the new field of satellite business development and which market area is your company focused on as an initial starting point, and how did you get the resource and educated manpower?

Also in the past space business accomplishment of NEC and Toshiba of our mother companies, the business deployment to an oversea market were challenged from very early stage. Through these efforts, an established reputation called NEC, Toshiba and, NT space is recognized also in this space industry, and it is our honor that we can provide the infrastructure which is helpful to people in the world.

Our company does not only perform the development of bus equipment to increase the order of the satellite system with NEC, but also aims to expand a market share of the communications satellite equipment whose market size is stable.

Therefore, the space business related engineers of NEC group companies such as NEC Engineering, Ltd. and NEC Aerospace Systems, Ltd. are concentrated to our company and the NEC Space Systems Di-

▲ Sky view of Sagamihara Facility in Kanagawa Japan

vision to increase the effectiveness of the work.

SJR: What are your next series of business development initiatives world wide? And what are your international business development strategies including Japan?

Based on the creative and careful manufacturing technology of Japan, the marketing of the satellite system should be challenged more to the emerging nations, etc. Moreover, in the field of a communications satellite, the agility and the flexibility of the communication system are requested, and I think that it is necessary to further technical development of the onboard communication equipment by looking at the technology trends of a ground system.

SJR: Could you introduce your Sagamihara Facility in Kanagawa Japan to our readers who are interesting in the excellent performance of satellite communication equipment manufacturer.

NTSpace business execution has been started using some of the buildings of NEC and Toshiba respectively. Then one of its buildings located at the Toshiba Keihin area needed the reconstruction due to the aseismic reinforcement. Therefore Keihin office was moved to NEC Sagamihara office in October, 2011. We fixed there to be able to perform the assembly work of the small standard bus NEXTAR of NEC, an assembly of a solar array panel, etc. Now Hayabusa 2 and small scientific satellite etc. are assembled there.

Moreover, the assembly work of the solar array panel for the commercial satellite was carried out based on the production innovation learnt by Toyota Production System.

SJR: the Basic Low and Basic Plan for Space Policy in Japan was established in 2008 and 2009 respectively and new activities in the field of space development are expected to encourage activity, what is you and NTSpace's strategy to get in this field expanded ?

Japan is trying to aim at expansion of an infrastructure building and a utilization of satellite in the new space business field such as Quasi-Zenith Satellite etc. In order to achieve these purposes steadily, the establishment of a PFI program and the construction of a special purpose company (SPC) are carried out.

However, on the other hand, a large expansion of a government budget is not expected at this moment,

▲ Interview seen President and interviewer

and then the new satellite development as an infrastructure is slowing down. It is understood that the incubation of a new business and the expansion of the overseas business are urgently requested now.

SJR: We have great disaster East Japan great earthquake, many communication channels were shut down. It seems to us ICT against disaster is one of most important technology to be developed for next generation in Japan. What policy you and your company have idea to be developed?

It is very clear that a satellite becomes an effective means of communication at the emergency situation by looking at the outstanding usage of WINDS"KIZUNA" in case of the Great East Japan Earthquake. However, it is not a business to prepare an exclusive communication measures for the disaster which can happen anytime. Therefore it is important to construct the infrastructure of the satellite communication bearing a dual use application at both the emergency time and the ordinary time in mind.

For that purpose, a large deployable antenna for the satellite is indispensable to achieve the communication using the small personal terminal, and the digital beam forming (DBF) technology is also important for pointing a beam to a stricken area region.

Moreover the use of UHF frequency range shall be taken in account to make a possible to communicate from indoor to a satellite in the emergency situation. Thus, it is no doubt that making full use of ICT is requested now.

SJR: On the whole business is growing steadily, and although the share price has not performed well in general, perhaps due to the fallout from the subprime loan crisis in the U.S and currently EU crisis in addition to that, Current new policy called Abe no Economics in Japan. You've been proactive in your investor relations program and other activities. What successes and setbacks have you had in this regard?

The economic conditions of the entire world may be stable with a macroscopic point of view, but in the market where we are challenging, there are many countries which are holding the subject separately. In Japan, although a regime change was done and the economy is buoying up gradually, the situation of the space business is still flat. Under such a situation, NEC is trying to expand the satellite manufacturing capacity by constructing a new integration center at Fuchu facility. NTSpace will also invest for R&D activity and the refinement of the equipment production facility.

SJR: The AIAA Japan Forum tries to keep abreast of developments in the satellite communications business, such as competition among satellite Internet, mobile communications and fiber optic service providers, as well as remain up-to-date on the state of R&D for satellite communication. What

sort of technological development do you think is necessary for Japan's space development in future? We appreciate your kind suggestion to our reader.

As the customer always requests, any challenges to achieve "more broadband", "higher output power", "higher efficiency" and "higher performance" should be continued. However the flexibility to change the configuration at onboard to incorporate the various requests is needed now. Moreover digital and software technologies for that are also needed. Anyway it is important to develop the technology which is consistent with a terrestrial communications system.

SJR: Finally, the AIAA Japan Forum is providing wide-ranging support for the AIAA ICSSC conference. AIAA Japan Forum has planned to hold the AIAA ICSSC 2015 some city in Australia in the autumn. We look forward to your support.

We have joined in the activity of AIAA with the NEC group for a long time and look forward to participating more in this precious activity.

SJR: We hope you will continue to cooperate with us in the development of satellite Broadband communication Systems. Thank you for taking your time to talk with us today and for support to previous issue of our SJR by your executive.

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