Mr. Shigetaka Shinozuka

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At the Superbird Ibaraki Network Control Center entrance

Biography:

April,1987- joined Space Communications Corporation
Feb. thru March, 1987- Trainee of satellite operations training course at SS/L(Palo Alto)
June, 1989- SUPERBIRD-A(original) successful launch and operation start
February, 1990- SUPERBIRD-B(original) launch failure (Ariane 4)
April, 1991 thru December, 1992- In charge of procurement of the replacement satellite and the operation procedure improvement at head office
February,1992- SUPERBIRD-B(new) successful launch
December, 1992- SUPERBIRD-A(new) successful launch. Returned to the operation station
July,1997- SUPERBIRD-C successful launch (ATLAS). Assigned to the launch director at Cape.
1998 thru 2000- In charge of SUPERBIRD-B2(BSS) and SUPERBIRD-D(LM) at head office
2001～ Returned to the operation site.

— Mr.Shinozuka, I understand that you are the professional in communications satellites operation technology with almost 20 years experience after you joined the company.
Please let me first ask you the motive that you chose the communications satellite carrier company, and then, the road of satellite operation technology as your job.

I joined Space Communication Corp (SCC) in April, '87. SCC was established in March, '85, and I was in the first group of freshmen who joined the company.
In my school days , I was inclined to choose engineering or system as my future work. However, I was in the desire of: ①trying my capability in the unknown areas, ②doing work that I can see how my power influences the company, even if the size of the company is small.

On the other hand, the moon landing of the Apollo 11 occurred when I was seven years old, the success of the space shuttle Columbia at 18 years old. Domestically, satellite broadcasting service with BS-2a started some time later. Then my school days was an age when it could be actually felt that commercialization of space technology was becoming realistic.
Since, from the child age, I had been interested in space or astronomy. Then, when I found the article introducing SCC right after establishment, in the corner of Nikkei Shimbun, I was impressed the fact that the enterprise exists that makes space a business !
Frankly speaking, I was immediately attracted in the company.

It was from the interests to see, to know and to touch a complex system of "satellite" that I chose the satellite technology after I joined the company. And to my memory, It was from my own hope for such job assignment.

—What kind of difficulties did you encounter during the preparation phase of satellite operations equipments and procedures before the first SUPERBIRD launch ? Please let me hear some funny failure story, if any.

During the first year after I entered the company, I had the opportunity to join the satellite operation training for two months at FACC (Ford Aerospace & Communications Corp, presently SS/L), satellite manufacturer. All lectures were in English. It was an honest impression that my head was crammed with a large quantity of information in a short term, while attending the ground test of the satellite. It was just one year before the launch of original SUPERBIRD-A, our first satellite .

When I was an orbit engineer before original SB-A launch in '88

At the part y celebrating training completion in '88

Although we obtained the knowledge of satellite hardware and the control equipment, the real challenge for us was : What kind of operation concept to adopt ? How that concept to be written down as operation procedures? Under what rules those procedures to be used? Since we had little experience in these matters, we made hot discussion in preparing the procedures, and decided the discipline of satellite operation in one year, since right after we came back to Japan until launch.

The primary control equipments were provided by FACC, the satellite manufacturer. However, since they were with a limited function and performance, we sometimes felt inconveniences in utilizing those equipments.
In that case, we added functions to the program (FORTRAN source code was provided to us.), increased hard disks, added the network. Thus, we made the system a complete one by such handmade improvements.

There are so many failure stories. Even after operation began, we found lack of equipments, encountered problems, and noticed the contradiction in our past decision. A lot of such embarrassing issues came out. Every time we found problem, we considered, decided and made corrections on site, aiming to achieve the complete and excellent satellite operation system. It was really a precious lesson for us.

Mr.. Shinozuka speaking with a operation engineer on site

—What feelings did you have through the total loss accident of SUPERBIRD-A, following the launch failure of SUPERBIRD-B in1990? I wonder whether you were in a situation of becoming courageous, considering that this is the really worst situation that any further worse condition should not come in the future.

In the launch failure of SUPERBIRD-B(original), we lost a precious satellite in one moment, and I felt a kind of “emptiness” by losing everything that has been prepared by that time.
Furthermore, the total loss accident occurred in the end of the same year (fourth year since I joined SCC), this time on SUPERBIRD-A (original) under service. And SCC became the communications provider without the primary communications equipments.

It came to give a large trouble for the customers who were using our communications satellite until that day. In a certain national-wide newspaper, the serial article titled ″Superbird with broken wing ″ was published for one week.

For several months after the moment of the accident, various influences of the accident kept occurring to the society, to the customer, to the stockholders and to all SCC employees and their family, as if they were the chained reactions.

By observing the above influences and changes thereby, I could recognize the fact that in my job of satellite operation, how my judgment and the operation by the tip of my finger be able to give a big impact on the society, and in how important job I was engaged in. Also, I felt that I, who existed on the site at the moment of the accident, am certainly responsible to some extent, and that the influences in front of me might have somewhat be affected by my activities.
As a result, I learned and obtained through the loss of SUPERBIRD-A(original) that the "ordinary" work cannot be done easily, and that, therefore, it is worth being enthusiastic in achieving ordinary work. At the same time, I felt that I, who experienced this accident should not come out from the on-site operation job.
These lessons learned became the starting point of my work.

The company made the decision to launch the replacement satellite immediately after the accident. It was transmitted to us on site that the many people including the stockholders were supporting us.
And all the customers who were forced to interrupted the use due to the failure of SUPERBIRD-A(original) kindly declared to return to our satellite, trusting the satellite and our operation, notwithstanding the replacement satellite was still in manufacturing phase on the ground. When I heard the news, I felt courageous and excited, pledging that we should never lose satellite any further.

At BBQ Party in the home of the SS/L engineer in Palo Alto in '91

—You had many opportunities to visit the manufacturers in U.S. Did you have some special impression

on the way of doing work by U.S. engineers which could directly be applicable to your own work?

I stationed at SS/L that was manufacturing the replacement satellite, for half a year in total in 1991. During that time, we discussed and studied many issues with SS/L, such as the improvement of satellite design, ground control system and satellite operation manuals, by reviewing the direct and indirect cause of the SUPERBIRD-A (original) failure and many other reflections. The results of the study were incorporated into replacement satellite design and ground control system design.
My primary job was to transmit the improvement requests on operation software and SOOH(Satellite Orbital Operations Handbook) from SCC operation team to SS/L engineers. SS/L tried very hard to listen to our improvement requests eagerly and reflected them in actual documents.

As is true in any era, the engineers who challenge the technical issues straightly and try hard to resolve them emit the kind of spirit generated by his responsibility, enthusiasm for fact finding and technical faithfulness. SS/L, at that time, was full of such zeal aiming that no failure in the next SUPERBIRD and no further trouble for SCC.

Looking back, the experience of joint work with SS/L engineers and Mitsubishi Electric Corp.(MELCO) engineers who supported us technically at that time became the backbone of my engineer’ s life afterwards.

Farewell party for Loral engineers after their stay in Japan (August, '93)

Attendance to the customers conference held by HSC(Hughes Space &Communications, presently BSS) is the very impressive memory for me. SCC at that time selected HSC for SUPERBIRD-C contractor, and they were building our satellite.
HSC at that time was being recognized as the builder of HS-601, the best-seller in commercial satellite industry. Probably, it was the age of climax in the business of HSC.

In the conference, about 20 satellite operators that operate 601 met together from all

over the world. HSC fully disclosed the anomaly information in orbit on 601 satellite series that they built, in front of the operator people. Also, they explained the feedback of anomalies to the design and the operation procedures.

Furthermore, the operator-side presented the trouble information on their satellite built by HSC. It was the opportunity for operators to ask improvement to the manufacturer and to share the information between operators each other.

Such attitude by HSC was highly impressive for me, since I was convinced that such negative information like satellite anomaly should not be disclosed from the customers. That posture showed their faithfulness as satellite manufacturer under the the condition that all the risk must be taken by the operator, the customer of satellite.
At the same time, HSC's business strategy to let the operators recognize the merit (such as the improvement of operation procedures) by procuring the best-seller satellite was strongly recognized through the conference.
I came to recognize that a large-scale business should need some special sophisticated way, in order for that business to be deployed in the large scale.

However, information disclosure like at that time cannot be expected afterwards by ITAR regulation of the U.S. Government (technological information disclosure limitation), and the recent situation of BSS is as known by many people.

—At the launch of SUPERBIRD-C in Florida in 1997, you were in charge of "launch director" from the customer side. Would you tell us some impressive story at that time ?

It was an extremely tight scheduled launch. The satellite had to be lifted off within only one month after the arrival at Cape Canaveral.
We had only one holiday at the launch base. That only holiday was spent by the shopping at the supermarket and tour of Saturn-V at the visitor complex of the Kennedy Space Center, to the best of my memory.

During the count-down sequence, the launch director of ATLAS vehicle suddenly announced that 10 minutes out of the launch window of that day was not available for launch because of COLA(Collision Avoidance). Since I did not know at all what is COLA, I asked. The answer was that Russian space station MIR will have disturbance on our estimated launch orbit. It was an simple story after all. However, since there was not any explanation about the phenomena at all in advance, I felt much uneasy at that time, frankly speaking.

Before fairing installation on SB-C (July, 1997)

As for the launch itself, it was postponed twice because of squall rain and thunder peculiar to the summer in Florida.
After all, SUPERBIRD-C was successfully launched at the third try, like the Japanese proverb "The third time is lucky."

—SCC operates satellites built by three different manufacturers, Loral, Boeing and Lockheed. Furthermore, you are going to have a new satellite built by Mitsubishi shortly. What is the point that you had hard experiences in the past from the standpoint of operating different manufacturers' satellite at the same time ? Additionally, what expectation do you have for the first domestically produced Suparbard from satellite operation standpoint ?

Among the same three axis satellites, for instance, the definition of the satellite attitude axial direction (Roll, Pitch, Yaw) or the positive/negative in the direction of rotation is different depending on the satellite manufacturer. Abbreviation of technical terms is also different. The operation philosophy of the satellite is also different.
Then, it is most difficult and important to Individually understand each of them , and then unify them based on the operation philosophy of SCC's own style, and applying them to the operation procedures and people.

Recently, because of the strengthened regulation of technical data disclosure restriction by the U.S. Government, and black-boxed satellite system, we have much difficulty to obtain necessary information when we discuss satellite behavior on orbit with satellite manufacturer people, and we often feel frustrated.

Moreover, I see the weakening of the system support activities to the operator by the satellite manufacturer, compared with the situation in the past, probably because of the change in the business environment.
For instance, the mistakes are incorporated in the revised edition of the operation procedures provided by the U.S. satellite manufacturers at considerable probability.
Also, there is often inconsistency in their technical explanation after the cognizant engineer is replaced.
These issues really become the stress in our mind when we are doing business with U.S. manufacturers.

In front of the satellite control antennas at SCC Ibaraki Network Control Control

As for the expectation for Mitsubishi Electric Corp: It is the first time that Mitsubishi Electric delivers DS2000 satellite to the commercial satellite operator.
Then, we have been discussing with Mitsubishi people frequently, in order to reflect the considerations and ideas to realize the operational philosophy or most reasonable satellite operation provided by SCC, into the ground software and operation procedures prepared by Mitsubishi.
It is expected that such efforts will be continued in the name of improvement after launch until EOL.
Such working relation and procedure cannot be realized by the usual satellite operators, even if they wanted to do so. I can say that we are already in the process of achieving what we expected.

—The technology for the satellite operation should have changed much from the age of the first SUPERBIRD-A. Please let me hear your view for the future tendency of satellite operation technology and also your desire for new technology or product ?

I have expectation for exotic technology, system and equipment which lead to the operation cost reduction in total.
One direction should be an upgrade of the on board automated functions. In case of orbit control, the satellite decides its own orbital position by itself, and it plans and executes the optimum control. Two or more satellites on the same orbital position measure distances each other, and safely collocate by themselves. These schemes could be achieved in the future not too far, I believe.

—How do you work on the technology transfer and education program for young engineers? Would you please give some words to the young people who aim at the satellite operation ?

Daily business procedures are to be transferred to younger people by us through setting an example and showing how to do it.
However, as for the transfer of technology itself, deepening the exchange opportunity with the engineers of the satellite manufacturer, and joint research program with NICT and the university, are considered to be useful for expanding young people's view. And we are trying to provide such opportunity as much as possible.

I speak repeatedly following three points to the younger people in my company. (I feel a little embarrassed if these words sound like "preach")
They are in some meaning the warning messages for myself in order to remind me of my original intension when I was first involved in this important job.

- The engineer should take the responsibility for his word and opinion.
- Our every movement we make will decide our future.
- Let's become the satellite operator so that SCC can be evaluated as excellent and No.1 by any third party auditors comparing our job with competitors at any time.

With the engineer at the site of the video transmission system

—Although the satellite communication business of our country is steady to some degree under the present situation, it seems to me that large-scale business using communications satellite does not evolve easily, and has difficulty to move upward. In what area do you consider to promote satellite business in the near future?

Various space related business implemented by the Government up to now will be transferred to the private organizations, I think.
My personal desire for the future is to challenge the business in the areas other than satellite communications, such as operation entrust of domestic and foreign satellites and providing services using "hybrid" SUPERBIRD equipped with various non-communication mission.
Our company has "space" in its name. I am one of the persons who joined our

company attracted by the word "Space". Therefore, I would certainly like to make the successful business using space.

—Lastly, please let me hear, if you do not mind, about your family, hobby and how to spend your off time. on holiday.

My family consists of wife, two daughters, and three cats. On holidays, I usually read the book, go to see the movie with my family, and take care of the cats. When I have extra time, I take exercise at the nearby gym.

Thank you really on your precious time, today.