

Overseas Space Business Status of Mitsubishi Electric (MELCO) and the Expected Role of the Government

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He had joined MELCO and started his career as a RF engineer in Kamakura Works in April of 1980. Since then, he has assumed various positions in Kamakura Works, which include Project Manager in charge of defense electronics, Manager of Space Information Systems, which develops various LEO satellites and Deputy General Manager of Kamakura Work, overseeing all MELCO space engineering and resource management. In April of 2008 he was appointed General Manager of Space Systems Division in Tokyo Head Office, position which oversees sales, marketing and business development for all of MELCO space activities, including government, institutional, and commercial satellite systems and related equipment businesses.

Currently he is a member of Society of Satellite Professionals International in Japan.

He received a Masters Degree of Electrical Engineering from Waseda University in 1980.

1. Preface

On March 7, 2011, the contract for building two communications satellites “Turksat -4A” and “Turksat-4B” was awarded to MELCO by Turkish national satellite communications company, “Turksat Satellite Communication, Cable TV and Operation AS”.

For MELCO, this contract was the next award after “ST-2” communications satellite of 2008 from SingTel (Singapore) / Chunghwa Telecom (Taiwan). It will be the tenth satellite which uses our standard satellite bus “DS2000”. During the proposal phase, a great deal of support was given by Japanese government agencies and related organizations, which was a strong back up for the contract award. On this occasion, we would like to express our appreciation to the concerned entities for the support.

ST-2 satellite was launched by Ariane 5 on May 21, 2011, and having gone through the critical events safely, it reached successfully to its final geostationary orbit on May 27. This became the sixth successful launch of DS2000 and the high reliability of MELCO satellite was demonstrated to the world. As such, MELCO’s business development efforts for overseas space market have been making progress, however there were a number of difficulties experienced in the early days.

2. History of MELCO overseas space business

Since the exchange of an agreement between U.S. and Japan on the procurement of Japanese Government’s non-R&D satellites in 1990, procurements for all the non-R&D satellites (i.e., satellites for practical use such as communications, broadcasting and meteorological purpose) have been made to be open, transparent and equal opportunity international bid. It was almost impossible for the Japanese manufacturers to win the international bids over U.S. and European firms who already had extensive flight heritages. As a matter of fact, Japanese manufacturers including MELCO were completely shut out from the competition by the agreement.

Under such circumstances, our first approach was to make flight heritages by exporting our component products for satellites such as “solid state power amplifiers (SSPAs)” for transponders and “heat pipe embedded equipment panels” to U.S. and European satellite manufacturers. Based upon the successful deliveries and flight records of such components, we tried hard to propose and sell satellite systems for the overseas satellite operators as the next step, however, we could not even receive RFPs from the potential cus-

tomers, to say nothing of a contract award.

It was the time that we fully recognized the difference of our capability from U.S./European manufacturers through the marketing efforts for satellite systems and components. We strongly realized the necessity of product competitiveness (high reliability, short delivery schedule and low cost) supported by integrated production facilities and successful flight heritages using standard satellite bus.

3. Our approach for the overseas space business development

To overcome such difficulties, we initiated the construction of large satellite integration and test facilities, and development of a standard satellite bus.

To begin with, we established a large satellite integration and test facility in our Kamakura Works in 1999, as an investment for providing integrated production capability of large satellites, aiming to achieve the higher reliability, shorter delivery schedule and lower cost. By placing one of the largest space chambers in Japan for simulating thermal and vacuum conditions in space environment, an acoustic chamber for testing satellites under acoustic environment during launch, and all the other facilities in a single site to provide an end-to-end design, integration and test production capability. We became the only manufacturer who has such an integrated satellite production facility in Japan.

In addition, we developed our standard satellite bus “DS2000” based upon the design of “Kodama”(DRTS) launched in 2002 and “Kiku-8”(ETS-VIII) launched in 2006 built under the contract with JAXA, with an improved design by the in-house R&D efforts. DS2000 was applied to the satellites such as “Himawari-7”, “Superbird-C2” and “Michibiki” (Quasi Zenith Satellite, test flight model) and through accumulation of the successful performance in orbit of these satellites, the quality and the reliability of DS2000 bus have been demonstrated.

Furthermore, we made efforts through the activities for the benefit of the customers in satellite launch and orbit insurance rate. In commercial communications satellite programs, satellites are usually insured by the operators to secure from the risk during the launch and after the placement into the orbit.

If the satellite reliability is considered to be high, insurance rate will be lower, which leads the operator’s expenditure to be lower. In other words, realization of a lower insurance rate has the same effect as the supply of a less expensive satellite for the customer, which brings us a higher competitiveness in a satellite competition. For this purpose, we invited the insurance underwriters to our satellite manufacturing facilities to present and discuss all the details from our design philosophy to operation heritages in orbit. Through these activities, we successfully obtained the world’s highest level evaluation (equal to the lowest level insurance rate).

On the other hand, outstanding fact was that MELCO established Space Communications Corporation* (SCC) jointly with Mitsubishi Corporation and other Mitsubishi Group firms in 1985, and was heavily involved in satellite operation business for more than 20 years. Unlike the other dedicated satellite manufacturers, this precious experience certainly gave us the capability to provide the satellite design with higher reliability and better operability on orbit, which certainly enhanced the competitiveness of MELCO products.

*SCC was merged into SKY Perfect JSAT Corp. in 2008.

4. World environment for the space business

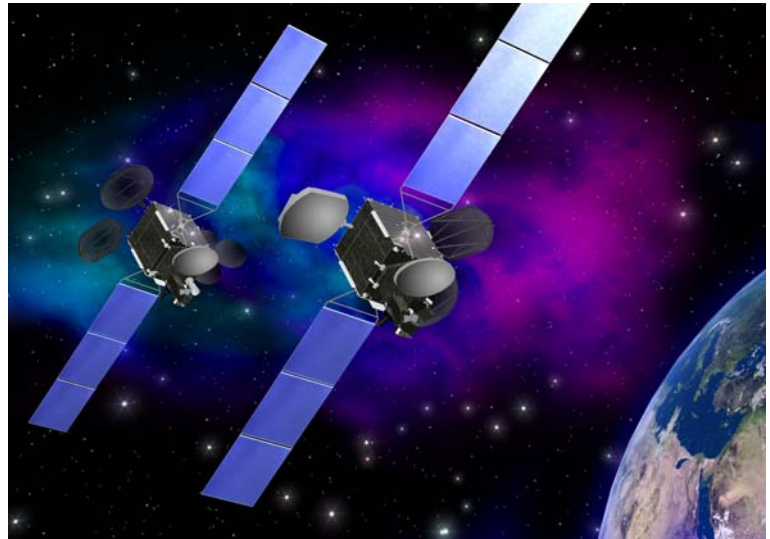
The world’s demand for commercial satellites has been estimated in the order of 20~25 every year. Although the similar number is predicted for the next decade, it is especially noteworthy that the percentage of the demand by the developing countries is likely to increase.

Recently, the government level activities for selling satellites have been becoming active, including the sales promotion efforts by the head of the country. Chinese Government has been actively promoting the diplomatic efforts to closely combine the development aid for natural resources with satellite sales in Nigeria, Venezuela and many other developing countries.

In Japan, the “Space Diplomacy” policy was set forth in the “Basic Space Policy” of the Government settled in 2009. Since then, policy documents such as “The Priority Policy for Space Activities” and “Promotion of Short Term Space Policy” have been published. In these documents, space system sales promotion efforts for overseas in the form of “packaged sales” with the systems in the different fields are mentioned. Under these policies, powerful support in the form of “infrastructure export project” by the government agencies and related organizations has been given to us. This support has been becoming the “favorable wind” for our overseas space activities.

5. Recent MELCO overseas space business status

As the result of efforts described in Chapter 3, MELCO won a contract for the first commercial communications satellite “ST-2” from overseas with our domestic satellite bus in 2008, followed by the award of “Tuksat-4A/4B” in March 2011 as mentioned above. In the case of “Turksat-4A/4B”, contractor selection schedule delayed considerably under the situation that U.S. and European manufacturers fought hard each other. As a result, it took more than one year until the contract agreement was made, which was an unusually long term “battle”. Both “ST-2” and “Tuksat-4A/4B” were awarded to MELCO following the severe competitions with the leading U.S. and European satellite manufacturers. It can be said that the high reliability of our DS2000 satellite supported by the successful in orbit data was properly evaluated in the world market.



▲ Turksat-4A/4B

In regard to our overseas satellite components business, the sales amount has been increasing steadily in recent years including the long term supply contracts with several satellite manufacturers in U.S. and Europe. Total number of satellites that integrated MELCO built hardware is now more than 440. Our most competitive products such as solar arrays, Li-Ion batteries and heat pipe embedded equipment panels now enjoy the top share of 30~40% in the world's commercial satellite market. Furthermore, with the high reputation of our rendezvous control technology for the International Space Station cargo transporter “Kounotori (HTV)” following its successful demonstrations, this unique technology has been drawing attention from the world, including the contract award of “Proximity Link System” for NASA cargo transporter “Cygnus” in 2009. As such, our long term hard efforts since 1990s now bear fruit, and our overseas space business is now making rapid progress as one of the major business units in MELCO space activities.



▲ ST-2 (©Singtel, CHT, STS Ventures)

6. What we expect from the Government

We have been working hard as a private company to expand overseas space business, as described above. However, we feel that the support by the Government is indispensable for the further export expansion. Specifically, we would like to have the Government supports in the following two ways.

First request is the support in each business offer. In case of the offers for the developing countries, package proposals are often required covering not only satellite procurement, but also the capacity build-ups, including technical assistance, industrial development and system test cooperation, which are necessary for their own satellite building plan in the future. Since it is difficult to implement these requirements only by a manufacturing company, further supports by cognizant government agencies and related organizations are requested.

The second request is the increase of governmental budget aiming the improved competitiveness of

products. In order to maintain the competitiveness against U.S. / European firms and further exceed them, continuous advanced engineering development efforts are necessary. Although the private firms will continue R&D by in-house funding, supporting efforts at the government side including continuous funding for R&D efforts and providing the opportunity such as demonstration on orbit by Engineering Test Satellite are requested.

7. Near future business perspective

It is our intent that we devote to the further overseas sales promotion activities corresponding to the demand increase of developing countries. By evolving DS2000 bus series to meet a wider variety of customer needs, we would like to realize doubling the number of overseas contract award to 2 satellites per year from the present one satellite per year.

In addition, as announced in the papers recently, we also plan to double the simultaneous satellite production capability from 4 satellites to 8 satellites per year, by extending the satellite integration and test building at our Kamakura Works. By this activity, total sales amount of MELCO space business will increase to 150 billion Japanese yen (1,950M\$) in 2020. Thus, we would like to enhance the reputation of MELCO as one of the world's leading satellite manufacturers. ■