

The Future of Space

'SPACE, the final frontier.' Borrowing a line from a famous television series, the race to the cosmos in present times is just as exciting. Besides the upcoming launch of RazakSAT, Malaysia's second satellite, the nation has also embarked on several other space programmes that can benefit its people in various ways.

Dato' Y. Bhg. Dr Ahmad Sabirin bin Arshad, MD/CEO of Astronautic Technology (M) Sdn Bhd (ATSB), is one of the pioneers for the development of space programmes in the country. Having been with the company since its formation in 1997, he talks about the challenges of moving from the world of academia into business, as well as the future of space.



What is the main function of RazakSAT and how does it differ from TiungSAT-1?

We produced TiungSAT-1, Malaysian's first remote sensing micro-satellite, back in 1997. Although it was a good project, it was, unfortunately, at the wrong time as it was during the recession. We were hurt badly by the currency exchange.

TiungSAT-1 was eventually launched in 2000. Being a small satellite, it could not be launched on its own. It has to be launched by riding on other satellites. TiungSAT-1 is almost 100% British technology as, at that time, we had very little knowledge on space technology.

The launch delay of TiungSAT-1 was a blessing in disguise as we were able to study and develop some of the hardware, as well as carry out experiments with the satellite. TiungSAT-1 was launched with three missions, namely, for earth observations, scientific Cosmic-Ray Energy Deposition Experiment (CEDEX) as well as for simple communication applications.

On the other hand, the primary payload of RazakSAT is a high resolution Medium-Sized Aperture Camera (MAC) which produces high resolution images in one panchromatic (PAN) band and four multi-spectral (MS) bands. It has been configured to orbit the earth in Near Equatorial Orbit (NEqO).

The main advantage of this is the satellite will revisit the coverage area about 11 to 14 times per day. This provides an imaging opportunity which is three times more compared to the sun-synchronous orbit. The images from RazakSAT offers extensive applications including forestry, fishery, agriculture, mapping, migration, transportation, security and other areas that would benefit the nation.

'I truly believe in the saying that, 'If you fail to plan, you plan to fail.'

Is RazakSAT 100% made in Malaysia?

When it comes to building a spacecraft, no single company can design or manufacture every part, it is simply not feasible. Some parts were developed internally while other parts were sourced from suppliers. The main idea here is to create confidence among our engineers, that we can produce something of our own however small. Indeed, I believe we have achieved that objective.

Although about 50% of RazakSAT is produced in Malaysia, most of the testing was done in Korea. We can only carry out basic testing here because we do not have adequate testing facilities. For us to construct such a testing facility, it would cost a few hundred million ringgit, which is not feasible.

We choose to collaborate with a Korean company because, at that time, they can offer the technology for storing high resolution imaging equipment in small satellites. As a nation, they are also very good in terms of innovating new ideas. The Koreans have their own space programme, space vehicle programme as well as satellite programme.

Countries like China and India have a comprehensive plan and the budget to support such plans. That is what we do not have in Malaysia. We urgently need one if we are to move into the next phase of development. I truly believe in the saying that, 'If you fail to plan, you plan to fail.'

RazakSAT will be launched from Kwajalein in the Republic of Marshall Islands with two other small satellites, namely, InnoSAT and CubeSAT, which is funded by the Ministry of Science, Technology and Innovation for experimental purposes with the involvement of five local universities.

RazakSAT will be launched in March or April 2009 pending the Cabinet's decision. Previous delay was

(To be continued on page 8)

primarily caused by the fact that the launch vehicle was not ready. It requires extensive testing before it is given the green light. It is quite typical for any launch vehicle to undergo testing for several years before it is launched.

'The difference between a technician and an engineer is, the latter is always inventing something new, looking at new frontier, and challenging their minds with new ideas.'

During the challenging times, was there any moment that you wanted to give up?

Never, I have always been an optimistic person. Even though things may look very bleak, I am always positive about any situation. I believe that is one of the criteria to take the company forward. I have always looked at ATSB as the entity that drives the future of space technology for the country.

As engineers, we should always be innovating something new, we should not be repeating ourselves. If we do so, we are no different from a technician. The difference between a technician and an engineer is, the latter is always inventing something new, looking at new frontier, and challenging their minds with new ideas. And this is what I do.

Engineers must show that they are relevant to the world today. Unfortunately, they have been taken for granted, unlike the medical profession which is highly regarded by society. People do not want to become engineers anymore as they do not see themselves as an important element of society.

We need to realise that engineers provide infrastructure to support good living, such as electricity, road, transport, etc. Yet, we have taken these amenities for granted. We engineers have never communicated our efforts and contributions, in fact, we have poorly communicated our roles in society.

I do believe that we should tighten the rules of who can become an engineer as now almost anybody can become one. This lack of control is partly to be blamed. I have been advising the local universities and academics that we must be able to extend the duration for engineering internships from a two- to three-month attachment to six to eight months.

The reason for this is because we do not come from an industrial background. Many of the young engineering students come from small villages and some have never seen an engine. Unlike people from advanced countries who are very familiar with technology, we do not have that kind of advantage.

Two to three months for an engineering internship is very short. We should follow the example of the medical profession where the housemanship is made compulsory for two years. The longer you are there, the more

knowledge you can acquire. I am seriously concerned that the engineering profession is lacking that kind of exposure. We want to be able to produce quality engineers.

'Space is very sexy.'

How was Malaysia's response to space technology then and now?

When we started 20 years ago, we knew that we were not ready. However, among Asean countries, nobody was doing it. The belief then was, if we did not start, we would never become the leader. Although we can jump on the bandwagon later on, we would just be a follower.

I am glad the government took the initiative to lead at that time. Until today, we are still the market leader within Asean countries. If we did not make the decision to start then, I believe we would not be where we are today. We realised we achieved world class standard when we were invited to give talks, lectures and conferences. Truly, we have gained international recognition.

What are some of the challenges of aerospace technology in Malaysia and how can some of these challenges be overcome?

Aerospace and space technology in Malaysia is fraught with uncertainties. The general opinion is that space is a luxury item, something we can do without. However, we should realise it is actually a necessity rather than a luxury.

The technology is needed to connect people around the country, to bridge the digital divide between the have and have nots, and to connect the people of Peninsula Malaysia and Sabah and Sarawak. It has the capacity to change lives via the implementation of telemedicine and tele-education.

In the state of Karnataka, India, more than 100 colleges are connected via satellites. Their government is able to provide high quality education to their people even in remote areas. This is what we are lacking. We have the ideas but not the infrastructure to support these ideas.

Right now, we are moving from remote sensing to communication satellites. The government has given us the approval to be the main agency to implement these programmes. We want to be able to provide the facilities to upgrade infrastructure for the benefit of all Malaysians regardless of where they are.

Our marketplace is the world as the Malaysian market is too small. This recession will be a challenging time for us and many other organisations around the world.

Some of our projects have been deferred or cancelled, but we still need to stay afloat, thus we focus on spinoff projects. Although this affects our bottom line a bit, we are positive we can survive. We are the warriors of space.

Among some of the projects we have created include an early warning system for tsunami, a radiation

(To be continued on page 10)



monitoring system, and a navigation system for the Marine Department of Malaysia. These projects consist of terrestrial applications based on space technology. This is what we are trying to do now, to utilise space technology for daily applications.

What is the standard of space technology in Malaysia compared to other Asian countries?

Within Asean, we are number one, and within Asia, we are number six. Our main competitor now is Thailand, whose industry is developing aggressively because they have a lot of funding.

Although it is easy to become the leader, it is not easy to maintain the lead. We understand the challenges coming from this country, but we are still positive that we can maintain the lead because we have got the technological capabilities and competencies.

The launch of RazakSAT will be the turning point where we can maintain the lead at the next level. Thailand has just launched their satellite and we will need to launch our satellite soon as well. Singapore will also be launching their satellite after that.

The space programme in Thailand and Singapore is managed by government departments, which means that they have a lot of restrictions in terms of operations. On the other hand, the space programme in Malaysia is run by a private organisation. So in terms of mobility, we are highly mobile and this is where we have the upper hand.

Within Asia, China and India are the leaders of the pack. India has just launched a moon explorer, while China has just launched a remote sensing satellite. I dare say that they are now challenging the United States and Russia in terms of being world leaders in space technology.

It helps that China and India's budget runs into billions of dollars per year, whereas our budget is only a few million ringgit per year. These are countries that will benefit strongly from space technology as they have a huge population and the critical mass.

In your opinion, what is the future of space technology in the country?

Although the future for space technology in Malaysia is

bright, it will inevitably encounter hiccups along the way. We should take the opportunity during those times to take a breather and to re-strategise. Space is very sexy and it offers infinite possibilities.

During the developmental stages of RazakSAT, some of the lecturers were selected to build parts of the satellite. This creates a snowball effect as the knowledge will be transferred from the professors to the students. We want to create a critical mass that will come back to the company as engineers in the future.

We have been able to build the company from nothing and achieve what we have today.

I would like to see more Malaysian companies do the same; to manufacture satellite parts and to come and compete with us.

Unfortunately, from my experience, these companies prefer to make quick profits. They do not like to invest in infrastructure and new ideas. It is very important that we change this mindset to one that is keen on developing local technologies and selling it to the world. We have manufactured and sold some of our hardware to countries like Germany and South Africa. Although it is small hardware, nevertheless, it is still a stepping stone for us.

In your opinion, what is the future of aerospace technology in the country?

I hope to see ordinary Malaysians be able to have their own personal satellites for communication purposes even though it is something that is beyond us now. In the next 10 to 20 years, I foresee that space travel will become the norm, much like how air travel is today.

I envision that in another 50 years, we will get to visit our grandchildren on different planets, stay at space hotels, and walk our pet dogs in space in the evening. I do believe that we are not too far away from this reality, as space travel is being made available to the public this year.

Space exploration only began 50 years ago, and what we have achieved up to today has gone beyond the imagination of many people. As for the next 50 years, this is a very short time frame, who knows what else we can achieve ■