

PRESIDENTIAL COMMUNICATIONS OFFICE
News and Information Bureau

MALACAÑANG INSIDER
HOSTED BY PRESIDENTIAL COMMUNICATIONS OFFICE DIRECTOR CRIS VILLONCO
WITH PHILIPPINE SPACE AGENCY DIRECTOR GENERAL DR. JOEL MARCIANO JR
AUGUST 19, 2024 [12:01 P.M. – 12:31 P.M]

PCO DIR. VILLONCO: Current developments, presidential directives, accurate and reliable updates straight from the Palace. Sitting-in for Daphne Oseña Paez, this is Cris Villonco for Malacañang Insider.

Philippine Space Agency is committed to promoting and sustaining a thriving Philippine space ecosystem. This vision aligns with President Ferdinand R. Marcos Jr's mandate to expand the use of space science and technology for national development.

Join us as we look deeper into the initiatives that shape the future of space exploration and technology in the Philippines. We have with us today Philippine Space Agency Director General Joel Marciano Jr. Good day to you, sir. Thank you so much for gracing Malacañang Insider.

PhilSA DG MARCIANO JR.: Magandang tanghali, Cris, at sa lahat ng mga nanunood. Happy and excited to be here.

PCO DIR. VILLONCO: Oo, maraming salamat din po. Recently—so let's get in to this, recently you celebrated Philippine Space Week, from what I understand, August 8 to 14, 2024, and congratulations to that. And also, President Ferdinand R. Marcos Jr. presided the 8th Philippine Space Council meeting. Can you tell us how that went? I'm sure that was very exciting for the President.

PhilSA DG MARCIANO JR.: Well, yes, thank you very much. First of all, it went really well. The President presided over the meeting. This is the 8th Philippine Space Council Meeting. Well, first of all, the Philippine Space Council, we have one, which chaired by the President, and the vice chair is the Secretary of National Defense and the Secretary of Science and Technology. There are other Cabinet members there in the council as well, as well as the chair of the Senate and House Committee on Science and Technology.

So we discussed the current state of utilization of space, science and technology and its applications in our country. The President instructed us to bring space technology closer to the people especially to the young ones. By bringing it to the public, then we can communicate the benefits of space technology better in addressing the many programs of government. We're there with the other government agencies in trying to achieve better synergy for using space technology.

PCO DIR. VILLONCO: It seems that there are a lot of members that comprised this council. And so, are there any specific presidential directives that you are currently focusing on? Or aside from obviously disseminating to the younger generations what Philippine Space Agency is doing?

PhilSA DG MARCIANO JR.: Well, we also gave an update on the development of our satellites, the MULA satellite, also bringing the space technology, making it more pervasive, the use of satellite images and data for government decision-making, policy-making.

So there's a directive to make this data more accessible and useful to government agencies in carrying out their mandates whether it's for disaster risk reduction and management, environmental protection, maritime domain awareness, monitoring of our natural and built environment, agriculture especially. So these are all national imperatives that can be addressed through these new tools that we can bring to the table.

PCO DIR. VILLONCO: Well, okay, so now that we got into the MULA satellite—I'm sorry, we kind of got a little, a bit ahead. Can you tell us more about it? I mean, how did it come to be? How were you able to conceptualize this? And how is this executed?

PhilSA DG MARCIANO JR.: When you think of space, we think of astronauts and, you know, planets, astronomy, that's all great because that's really inspirational and we hope to contribute, you know, our country, our young people to scientific advancements. But there's an aspect of space as well where we turn our sights back down towards earth. This is earth observation, and satellites can be used for earth observation, can be used for telecommunications and all these capabilities.

Now, we only have to look at ourselves on a map where we see we are an archipelago. We have thousands of islands that need to be connected and bridged, and we want these islands to be productive. And we want the governance to be enabled by better data, so that's where these satellites can come in.

MULA is a class of satellite where we equip it with the camera. It takes pictures of our country. But mind you, not just our country but other countries as well because it goes around the earth. And the pictures that it takes, well, that is for agriculture monitoring primarily but also for looking at water, the seas, and also for responding to emergencies and disasters. It carries a camera, that is called a multispectral camera. What that does is—well, you have a garden, right?

PCO DIR. VILLONCO: Yes.

PhilSA DG MARCIANO JR.: So you have plants and you are interested in how your plants are doing, whether there's water deficiency or whether there's enough water, you need to water it. So I think these things, it's kind of hard to see with the human eye but with satellites and their cameras, they operate at this called wave lengths – very fine bands of, you know, light where you can measure vegetation and their state of health. So imagine doing that on a very wide swash.

MULA can take a picture, that's about 120 kilometers wide, and it can measure, it can monitor a hundred twenty thousand square kilometers of our country in a single pass or during the day. So that's its capability. We're building this satellite with 16 Filipino engineers in an industrial setting.

PCO DIR. VILLONCO: So, basically, it can detect not only the physical aspects but everything else that's going on within a specific environment, I'm assuming?

PhilSA DG MARCIANO JR.: Well, with agriculture, it measures, well, it measures this reflectance of the light. So then, with that, it can measure the health of the vegetation, the state of cropping, etc. Also, we can look at soil; we can look at bodies of water and the condition in the water, look at—all these parameters of the earth and make better decision, science-based decisions.

PCO DIR. VILLONCO: Amazing. So ano po iyong kaibahan po nito from the other satellites? I understand, you corrected me a while ago that there are 1.2 that are coming from the Philippines?

PhilSA DG MARCIANO JR.: Well, previously, we had built this Diwata class satellite, 50 kilograms, so about the size of a balikbayan box; and we also have small nanosatellites. Now, one big difference of the MULA satellite is it carries only one camera. You know, in a satellite, there's very limited resources in terms of the power; in terms of the computer that's in there to kind of process data and manage things.

So what we did was, with this, it focused all that resources on one camera as opposed to Diwata-1 and Diwata-2 which were more scientific experimental satellites. It carries more than about three or four cameras so to try to experiment with these cameras. So that's one main difference.

PCO DIR. VILLONCO: And so, with regard to disaster resilience—we'll go back to the MULA satellite—how does this improve disaster response in the Philippines and, of course, environmental management?

PhilSA DG MARCIANO JR.: There are three things that immediately come to mind. You know, when we have these satellites orbiting overhead, when we know there's a typhoon, for example, that's coming, we take pre-typhoon images of our country in the places where the typhoon is projected to cross. And then when the typhoon passes, we take the post-typhoon images, and you see the changes there. Among other things, you can detect flooded areas and what kind of areas are flooded, whether these are agricultural, residential, built-up areas, etc. There are maps that are produced as a result of this. And we are increasingly using machine learning or artificial intelligence in look at these changes so you can generate these maps quickly and send them out to groups that can act on it – the Office of Civil Defense, etc.

There's another thing, you know, with the recent oil spill that we've had, the satellites, it's like the ultimate high ground where you can see a lot of areas at once. So you can see the extent of Manila Bay; you can see where the oil is. And the static picture which you take from time to time goes into these models. For example, Marine Science Institute of UP uses these images to validate their models, and their models run and they try to predict where the oil will go – so when will it reach the coastline and when it will affect the habitant, etc. So that's the purpose of these satellites and their images for disaster risk reduction.

One more thing about drought, proactively, you can use satellite data to say whether an area is going to be afflicted by drought. And this is where synergy with agencies like the DSWD come in, where they can

come to the place, and on a pilot basis, we did that a few months ago, extend assistance to farmers that are going to be affected by—

PCO DIR. VILLONCO: So how far back can you actually predict that this may be a drought area?

PHILSA DG MARCIANO JR.: Several months, I think, you can do that. You can give sufficient lead time to have that action, that proactive action.

PCO DIR. VILLONCO: Okay. So MULA satellite is a collaboration project. So how can we assure the success of this project?

PHILSA DG MARCIANO JR.: There's, of course, the utilization of the satellite. This satellite does several things for our country. Number one, let's talk about the so-called downstream, because when we have satellites, we use them. And in this case, it's an earth observation satellite. So the data coming from the satellite will be available to all government agencies and also to the public and even the private sector. The utilization of this [unclear] have applications in agriculture, maritime domain awareness and responding to emergencies and disasters and all of those important applications for the country.

So we want to promote further utilization, not to mention how the data can also be used in schools to train the next generation of students who will process all of these data and learn about the technics on how to produce maps out of satellite data.

What it does for us also in the upstream is, remember, we're not simply buying a satellite; we are building one. So, I think that needs to be emphasized. We have 16 Filipino engineers in an industrial setting and their fingerprints are on this satellite. They are gaining know-how in the inner workings of this satellite and they will come back and they will propagate this capability also to local companies and industry.

There's a license that we gained to remanufacture this satellite in country the next time around. So, building the MULA satellite the first time now, this is part of a roadmap of succeeding satellites where we will increasingly involve local Filipino companies so that we can open the door for them to build not just products for Earth but space-qualified products.

PCO DIR. VILLONCO: Wow, this is a number of major success indicators! That's pretty amazing. How are the international space agencies partnerships? How do they collaborate with you?

PHILSA DG MARCIANO JR.: Well, thanks for that question. You know, when they first learned that the Philippines has a space agency, the first thing that we hear from them is, "Congratulations! How can I help you?" So, that's really great. We were young; we were building up during the pandemic as well and we have other countries extending assistance. So, of course, Japan has been a big part of our space technology activities even before the space agency, with the DOST programs, with their universities. We sent Filipino students there to get their masters and even their PhDs and they've come back. Some of them are in the space agency.

We continue to cooperate with other countries. The space is a domain where it's inherent to have international cooperation. We subscribe as a framework to the space value chain. So, basically, its components that we have to have in place in our country that would lead to socioeconomic benefit and value creation from space capabilities.

So, we look at each block for some of the satellites, the data whether it's accessible, or the ground infrastructure and the ability to process the data from the satellites and also the impetuous to act. So, that's in a way the chain.

So, when we talk about international cooperation, we resort to that to strengthen each of these blocks commensurately where we have gaps, where we have these deficiencies, and then partners are willing to help us. So, we've signed agreements, I mentioned Japan. We signed an agreement also with Argentina, with the UAE. There are more countries coming up soon that will sign cooperation agreements with.

PCO DIR. VILLONCO: Wow, so much pressure on the satellite! Kailan po ba ito ilo-launch?

PHILSA DG MARCIANO JR.: MULA satellite, the target is, well, first quarter of 2026. Crossing our fingers, maybe last quarter of 2025 but then we can bet probably on the first quarter of 2026.

PCO DIR. VILLONCO: Fantastic. Okay. So, sa aming pagbabalik, PhilSA aims to develop and maintain a thriving space industry in the Philippines. Pero anu-ano pa nga ba ang mga programa at inisyatibo ng ahensiya para makamit ito? More on this when Malacañang Insider returns.

[COMMERCIAL BREAK]

PCO DIR. VILLONCO: You're still watching Malacañang Insider with Philippine Space Agency Director General Joel Marciano Jr.

Sir, aside from the MULA satellite, what other satellite projects are currently in the pipeline?

PHILSA DG MARCIANO JR.: Yes. We have Maya-7. Maya-7 is a CubeSat. We continue the development of these CubeSats nanosatellites from Maya-1 to Maya-6 which were supported by DOST. Now PhilSA has taken over, and this Maya-7 satellite is twice as big as the previous satellites. And what they are is that it's a platform for demonstrating new technologies. They are being built out of the university.

So, we want to strengthen this further. We want more universities, even high schools, to contribute to building these satellite missions for CubeSats. And in the course of building it, they have mission ideas, they think of experiments – what can we put in the satellite that measure things in space or maybe put a simple camera or radio – but at the same time they can engage these local SME's, small, medium enterprises companies to build these components and do these jobs for them so then...it really leads them to becoming space qualified. So, this builds up capabilities of these companies as well. So that's kind of industry-academe engagement that we want to foster.

We're also operating still Diwata-2. So, we're very proud of Diwata-2. It has taken a lot of pictures; we've learned a lot from that not just operating the satellite but building it. We hope to continue that further with Diwata-3. And if ever Diwata-3 flies, it will carry at least nine locally-made components inside that satellite. So, we're trying to increase the local content in these satellites not just the, of course, not just the people working on it but the components that are built and the software that is written. Remember, these are computers. We call them nga computers in orbit. If computer makes you productive on Earth, imagine if it's in space, helping all of us out. So, that's continuing.

And we also are in the process of conditioning this NovaSAR satellite from the DOST to PhilSA. And little bit about this NovaSAR, it carries an instrument called a radar. And what it that does? It can see through clouds; it can image at night. So, our country is very cloudy, some places are stubbornly cloudy so you have a problem with cameras taking pictures from space if it's cloudy. But then with radar, it can see through those clouds and measure what's on the surface. So, we are using that, we are interested in building more capability in this kind of satellites for our country.

PCO DIR. VILLONCO: So, I'm assuming, these will all align with the long-term goals of PhilSA especially with regard to updates. As you said, you know, these are computers in space, so there's always going to be a need to be updating all of these technologies.

PHILSA DG MARCIANO JR.: That's true, Cris. In the Philippine space policy, it is written that we have a central goal of becoming a space capable, spacefaring nation within the next decade. So, being spacefaring, means you have people think of astronauts, right, but satellites are kind of a proxy for astronauts. It could also mean you have rockets to bring things to space but at the very least it means you have infrastructure that you operate and control in space like satellites – that makes us spacefaring. So, we are spacefaring by that definition already because we operate and control our own satellites going around the Earth.

The other thing about space capability, what that means for us is we must build an industry. Space capability for a country means industrial capabilities. So, that's part of a sustainability plan. So, we have a roadmap of these satellites where we try to engage local companies possibly through PPP's as well down the line where we increase local content in these satellites and start building them more here in the country.

PCO DIR. VILLONCO: So, sir, what initiatives is PhilSA implementing to engage and inspire the next generation of Filipino scientists and engineers? Me, myself and I was looking at your social media accounts and actually, I think, what I understand are personal social media accounts also of your team. You have a very young team. And it's so impressive to actually see what they can do and then introducing themselves and everything else. So, how else can we inspire and actually invite the younger generations to take interest in space because as you said, one of your teammates did say that there really is space in space for all of us to get to learn more and to maybe achieve more?

PHILSA DG MARCIANO JR.: That's true. We're very proud of this young team. You know, the average age is 28 years old in the team. I tend to pullup that average in office. But, yeah, you know, one thing that we can do and we've done and we want to continue doing is citizens science. This data that comes from

satellites, they need to be validated as well from the ground. It's called ground truthing. We did this with DENR, with the nationwide mangrove maps. So, we trained a computer model to detect all the mangroves in the country and then produced the map. Knowing full well that when we produce map, because we use AI for good, and this is one really great application, we produce the map quickly knowing that there could be some areas where we might be, may not having very accurate. So then, release this map to the public, that's sounds counterintuitive, right? But then it comes with the challenges of please help us validate this map.

So, now you have local government units, you have NGOs, you have civil society organization, you have children from school going on fieldtrips to their local mangroves, taking pictures using a mobile app that we told them that this is one thing you can use in contributing data back to us.

So, we've hit our targets in terms of validation. So this nationwide mangrove map, apart of from being on our dashboard, in our website, it is also in the National Museum. So, you can visit the National Museum, you see the nationwide mangrove map.

So, we want more community engagement this way. That way, space is really not distant from our lives, you know, you may look at space, how can that affect my daily life. You know, but you produce information from satellites. And I brought the show and tell here, well, this is another way you can engage next generation.

PCO DIR. VILLONCO: Actually, wait, before that, I know that the little ... in the packet that you gave me a while ago, this is a mangrove.

PhilSA DG MARCIANO JR.: Oh, yes.

PCO DIR. VILLONCO: Is this the one that you're telling me about?

PhilSA DG MARCIANO JR.: Yeah.

PCO DIR. VILLONCO: That [unclear] something?

PhilSA DG MARCIANO JR.: So, we have fun with these things. This is a bookmark. We call mobilizing space data, because that's what we do. You mobilize it and that means, people use it and act on it, not just produce the maps. But shown here, maybe it's hard to see on camera, but it's a hologram. And then when you do this, it shows mangrove map; it shows how satellite images are monitoring in a case of a landslide, the extent of the landslide. The mangroves are mentioned that there also flood impact mapping.

So, when you do this, you can see that the satellite image before and after, when the maps are being produced.

PCO DIR. VILLONCO: Okay, let's continue with the show and tell, that we have over here. And now we also have these nanosatellites?

PhilSA DG MARCIANO JR.: Yes, this is the CubeSat. This is, I think, patterned after Maya 2. You know what, it's not a model; it's actually works. This is a satellite here. It's an engineering model. It's a model we have in the laboratory. We kind of test it to destruction. Because before you put something up to space, you have to make sure that it can survive the hostile environment of space.

Like for example, where you on Earth, when something gets hot, when it's hot, you fan yourself because there's air. But in space, there is no air, so how can you dissipate heat. So this goes to a lot of battery of test.

But, going back to the question of how we engage the youth, this is now being built through our universities. Right now, there's a few universities collaborating on it. We want that to expand further. We've opened up the design of this satellite by teaching it in the universities. We want other universities in the Philippines to kind of start with that blueprint, copy it. And pretty soon, we want high school students to be working on satellites like this.

PCO DIR. VILLONCO: Grabe, iba na po talaga. We were just talking about it a while ago with DG Joel na kung noon, even in high schools 'di ba—sorry, kung naabutan ninyo po ito, pero ako naabutan ko iyan—an mga acetate and ang mga you know diorama to explain everything that's going on outer space; and now we have this already. I mean, how amazing is that that there's access to younger generations for something like this.

PhilSA DG MARCIANO JR.: I'm pretty sure naabutan ko iyon. You know, I'm a teacher, I still use some of that, few years ago. But, yeah, it experiential learning. It's really hands on, that kind of vaporize all these abstract concepts from the mind of students by actually seeing how things work.

Space is becoming more accessible including for country like the Philippines. That's why also important to start talking about sustainability of space and responsible use of space. So, there—I have one more thing I brought here, this is a book, children's book. Si Tala at ang Kaniyang Lakbay Kalawakan. Now, what so special about the children's book and space? We have many.

But this one, I think it's quite novel because it introduces, well, it introduces Tala. She wants to go space, a young Filipino that wants to go to space. She tells a story of the United Nations office for outer space affairs, the committee on the peaceful uses outer space and also the different space treaties – so there are.

So, I think this kind of knowledge does not really reach young kids. But, for example, she has a spaceship, the first thing that she has to do as a responsible space farer is she has to register her spaceship. And then when an astronaut lands in her backyard, she has an obligation to help, that's the rescue agreement. So, earlier I told you that's the registration convention. So, there other things that the book [overlapping]

PCO DIR. VILLONCO: Oo nga naman, there should be parameters even in space. So, it's a great introduction also.

PhilSA DG MARCIANO JR.: So, we conducting book readings of this. Maybe I can announce that later this week, we will have the UK ambassador in front of young kids in UPIS, reading the book to them. We're translating it in different languages. It's open, you can download it from our website.

PCO DIR. VILLONCO: I hope in dialect too.

PhilSA DG MARCIANO JR.: Also, yes, certainly, yes. And were distributing it everywhere.

PCO DIR. VILLONCO: Okay, nice.

PhilSA DG MARCIANO JR.: Thank you.

PCO DIR. VILLONCO: Very nice. Okay, let's go to climate change and national security are significant concerns, of course, of the country. So, how is PhilSA specifically addressing these challenges?

PhilSA DG MARCIANO JR.: Well, national security and development is one of the key development areas embedded in the Philippine space policy for space science and technology applications. You see, these satellites, space and infrastructure and the ground infrastructure, the ground segment and the space segment—well, they are infrastructures. You know, we talk about roads, bridges; we talk about airport, seaports, but now we are starting to have satellites come in to the picture more as part of vital national infrastructure.

In [unclear] things, you know, with this ultimate high ground of space, you can see many things. So, for maritime domain awareness, so we contribute what we can to help in decision making and planning in those areas. So maps, whether it's also for oil spill monitoring and monitoring environmental condition in oceans and waters and the islands, so we have a project with the Europeans where they are using satellites data as well to monitor this Benthic habitats. These are coastal areas with sea grasses and corals, etc. So, we contribute to these efforts because it's part of our mandate.

PCO DIR. VILLONCO: Okay, so aside from the UK visit, other any upcoming events or programs where Filipinos can learn more about PhilSA work? And, I mean, how can the public, especially the younger, once get involved in supporting space initiatives in the country?

PhilSA DG MARCIANO JR.: Yes, we've just finished celebrating Philippines Space Week, that's August 8 to 14 every year 'no. But then, World Space Week is coming up, that will be in first week of October. So, with World Space Week, you can expect more activities from the space agency. The theme of World Space Week this year is "*Space and Climate Change*". So expect not just government agencies to be involved but young people in terms of the citizen science, in terms of the use of satellite data as well.

So, please look at our websites and our social media accounts for more information and also some of the archives from our Philippines Space Week – they are still there, they're still posted on our channel. So take a look at that and we will make sure we will invite everybody to these activities.

PCO DIR. VILLONCO: Okay, and in terms of space exploration, what are the future plans of PhilSA?

PhilSA DG MARCIANO JR.: Okay, well, I get asked whether, you know, astronauts are in our plans. I think you cannot discount the impact of a Filipino astronaut, especially young Filipinos inspiring them to have this career in science and technology and even policy for space 'no.

So, you know, I think it's a matter of—actually, many astronauts we will have in the future. Well, remember, the astronaut is the lucky person who gets to conduct these experiments in space, for the benefit—

PCO DIR. VILLONCO: Lucky but needs to qualify.

PhilSA DG MARCIANO JR.: As well.

PCO DIR. VILLONCO: That's the major thing.

PhilSA DG MARCIANO JR.: That's true, qualified a person, battery of training and testing, etc. But, yeah, we have to back it up with the body of science. So that's our opportunities for us, as Filipinos, we can contribute our research on space nutrition, space medicine, space wellness even. So these are opportunities for Filipinos to come up with meaningful, impactful science in space that will benefit not just Filipinos but all of humanity for years to come.

PCO DIR. VILLONCO: I think with technical and scientific knowledge, plus the resilience also and the adaptability of Filipinos, I have no doubt that it's going... we're definitely going to win the cards of having a Filipino astronaut.

PhilSA DG MARCIANO JR.: I should add as well, there's a lot of interest and enthusiasm on astronomy. We are seeing that with young people contributing to these efforts. We've seen a growth of student organizations in space, so the future is bright for our country.

PCO DIR. VILLONCO: Exciting. Direc. DG, thank you so much. This has been an enriching conversation even for me. So thank you once again for being here and we hope to see you again, one of this day—not naman these days but, you know, to discuss further all the initiatives of the Philippine Space Agency. Thank you, sir, again.

PhilSA DG MARCIANO JR.: Maraming salamat. I hope to be back.

PCO DIR. VILLONCO: Thank you.

Through our nation's collective resources, people, institutions, infrastructures and capabilities in space science and technology innovations, we will open opportunities for advancement in the global space economy, ensuring the continued progress and development of the Philippines.

Join us again as we bring you in-depth views of the latest issues and regular Palace updates. Sitting-in for Daphne Oseña-Paez, this is Cris Villonco for Malacañang Insider. Have a great day.

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