

The official Newsletter of the Industrial Technology Development Institute published semi-annually

Laboratory launch ITDI hits new plane of excellence



ITDI MiC Launching with DOST Usec. Fortunato dela Peña (center), PCIEERD Director, Dr. Rowena Cristina Guevara (R) and ITDI Director Dr. Nuna Almanzor (L)

On July 1, 2014, in time with its 113th anniversary celebration, ITDI successfully launched two newly established laboratories. These were the Metrology in Chemistry (MiC) Laboratory and the ITDI-DOST Nanotechnology Laboratory.

included other officials and staff of ITDI, DOST line agencies, national government agencies, the academe, and private sector.

"Once tested, accepted everywhere"

While ITDI has nationally and in-

ternationally validated its standards on physical measurements, being the national custodian for weights and measures, it nevertheless needs to establish a national measurement infrastructure for chemistry or metrology in chemistry as well.

Every MiC laboratory aims to establish comparability and traceability of its chemical measurements such that results of tests done in different laboratories, regardless of country of origin, field of application, or time performed, will be accepted everywhere.

The Standards and Testing Division of the Institute started its MiC activities under the program "Development of National Standards for Chemical Measurements" focusing

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Coconut milk reinvented -- from food additive to thirst quencher

Coconut water has long been popularly sold as beverage in local and foreign markets owing to its nutritious value and refreshing taste.

Most of its patrons find its mundane appeal as freshly harvested "buko juice" usually sold by ambulant hawkers along waysides. Its processed rendering, on the other hand, end up in stand-up pouches and plastic bottles, while posh bistros offer it as base for cool cordials and smoothies.

With so many options of various coolers in the market, it is thus surprising that consumers still repeatedly buy this product. And quite like the clean and clear coconut water in popularity is its creamy variant -- coconut milk.

Just like other dairy products, coconut milk may be consumed as



Trial production of coconut milk with different formulations.

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From the Executive's Desk...

How time flies. As I look at myself at the mirror, I see a young Nuna -- go-getter, eager, always raring to live life.

Last September 21, I turned that magic retirement age. And so all sorts of images of the past and the present zipped by my eyes.

I guess, anyone at my place that day would not be able to comprehend the vastness, the color, and the variety of life that I lived.

Oh no, I have never been shy of living. My family is the perfect example of how I lived -- happy, vivacious, and brave.

As the first lady director of an industrial research and development institute, I know that most will agree with me that everything then and until now have been uncharted waters.

There were no maps, no mountain guides, or snow dogs to sniff off danger or hardships. The trek was rocky, arduous, and long. There have been years when nothing seemed to go right -- nothing new, nothing exciting, nothing worth risking my neck over.

So shall I recount those years with a list of all that have been as other directors are wont to do on retirement day?

I am the first lady director of ITDI, so I would not be doing that.

What I would like to recount on my last message as director is how it was and is as a person - a glimpse of what humanity can profit from my lifetime.

- *I spent time wisely and tried to be there for everyone. Often I spent double time.*
- *And was there ever a time when you just had to laugh and cry all at the same time at what was happening at the office? I soon learned that as time passed it was much nicer to do it with people who know you. I do miss those times.*
- *Once someone said to me, "I cannot say thank you enough for your help. Your laughter during those shared times were the best times that I spent with a friend."*
- *Or how about this? "Ma'am, congratulations on your retirement. You have completed a stellar career."*

Now aren't that something that no public service awards can replace in my heart?

Dear friends and colleagues, I understand the joy and pain of leaving THE OFFICE, of not being able to see you and other department staffs.

But, what I would like to remember most about this occasion is a picture of a new life with other equally important people, all eagerly waiting for me.

I guess all retirees dream of this moment -- that 'Ahhhh moment' when you realize that all along, every sacrifice was worth it simply because you lived it and lived it well.



Dr. Nuna E. Almanzor, ASEAN Engineer
Director

'I AM READY' with ITDI Ready-to-Eat Nutrifoods

Typhoon Yolanda. Bohol-Cebu earthquake. Mayon volcanic eruption. Shanty fires in cities.

Add to the headlines list other natural and man-caused calamities that continually affect the country and what is left are thousands of suffering, displaced, and hungry families - living off relief goods and scant basic resources.

Calamitous events may be fast and furious but so is the response of the Industrial Technology Development Institute (ITDI) as it refreshes the technology behind Emergency Food Reserves (EFR), now aptly named as SAGIP Nutrifood.

SAGIP Nutrifood is ideal as ordinary food substitute during calamities, indeed convenient when electricity and water supplies are usually down or cut off for safety reasons. An energy food in powder form, it is made from cassava, camote, mongo, and malunggay. Admittedly

bland in taste, it is nevertheless highly nutritious, filling, and can be added to other foods to make them healthier.

It is extremely useful when food preparation in devastated areas and evacuation centers is difficult or near impossible.

Available in aluminum retort pouches these are ready-to-eat, pre-cooked meals - truly ideal in providing immediate relief to hungry victims.

In addition, for disaster-stricken areas with job opportunities gone, preparation of EFR can be adopted by concerned LGUs as a new source of business and work.

A Pack of Hope

In hind fight, ITDI first introduced the technology when Mt. Pinatubo erupted in June 1991. Burying surrounding communities of Zambales, Tarlac, and Pampanga Provinces, Pinatubo

hit the town of Botolan, Zambales hard.

With food supplies scarce, the local government worked to mitigate the effects of the eruption.

Calling on ITDI for help, LGU-Botolan brought in SAGIP Nutrifood to the region and found a more nutritious alternative than the common gruel (rice porridge) or canned/processed foods commonly dished out in evacuation centers.

As an offshoot, other government units have been presented with better, healthier options to help survivors of calamities cope through a new technology called Ready-to-Eat (RTE) emergency food pouches.

The Packaging Technology Division of ITDI, in cooperation with the Department of Social Welfare and Development, are calling the technology 'Pack of Hope' recalling that expectant feeling derived from a new beginning.

Better rubber for all

Who in the world does not use rubber? We use it in pencil erasers, automotive tires, adhesives, footwear, sports and recreation equipment, industrial machinery, and more. But we do not always get the best and sturdiest rubber product, do we? We at the DOST's Industrial Technology Development Institute or ITDI want to change that by starting to integrate quality testing services for rubber and rubber-based products at our Standards and Testing Division (STD).

Why integrate?

Rubber has been a valuable Philippine commodity for decades, helping the Philippine economy since the 1900s. However, the rubber industry is being hindered by the lack of testing laboratories and product standards in the country, which may have caused difficulties for consumers and manufacturers alike. Defective products - for example, the rubber hoses and hose assemblies used by oil, gas, and liquefied petroleum industries and consumers - pose great threat to both property and human life, and thus are a major concern for the industry in terms of safety aside from the economic impacts.

Thus, there is a need to establish standards and testing protocols to ensure that rubber products, both locally-produced and imported, adhere to national and international quality standards. With this, the Philippine Rubber Industries Association (PRIA) and other key players in the rubber industry, along with the Board of Investments under the Department of Trade and Industry, and other government agencies such as the Industrial Technology Development Institute (ITDI), and fellow DOST agency Forest Products Research and Development Institute (FPRDI), are creating a roadmap

to help improve the Philippine rubber industry, especially with respect to process input and other technical issues related to standards and testing of rubber products. In fact ITDI had been identified by the Department of Trade and Industry's Bureau of Product Standards Technical Committee No.16 (BPS-TC 16) as the appropriate agency and third party laboratory to offer a complete testing service that permits the product specification to be verified prior to issuance of the quality mark by the enforcing authority.

By integrating testing services of rubber and rubber-based products, ITDI ultimately aims to enhance its capacity to offer complete laboratory testing services for manufactured rubber based on industry requirements. It also aims to integrate analytical testing services for manufactured rubber in STD-ITDI in accordance with established standards especially mandatory standards and the test requirements for the DTI issuances of PS/ICC quality mark, and to initiate accreditation of additional rubber testing services to ISO17025 standards.

What is in it for us?

So what does this integration mean for the future of the rubber industry? It means that new or upgraded testing facilities and newer, more complete state-of-the-art testing equipment can now be procured or built. It means that with testing facilities available at ITDI, there would be less need to send samples abroad to be tested, which can be expensive and time-consuming. Product standards can now also be set based on local conditions and yet remain in accordance with global standards. And with these standards in place, more efficient testing facilities

may now be established and developed to accommodate the demands of the growing Philippine rubber industry as more rubber technologies are being developed.

With the integration of rubber testing services, ITDI and DOST aim to help the following sectors: the infrastructure and transportation sectors within the DPWH (Department of Public Works and Highways) and the DOTC (Department of Transportation and Communication), such as airport management agencies like the Manila International Airport Authority (bearing pads, waterstops, aircraft tires, hydraulics, etc.) and railroad service authorities such as the Light Rail Transit Authority (wheel linings, dampeners, etc.); Metropolitan Waterworks and Sewerage System (MWSS) and other water service companies (rubber sealing/gaskets, hoses, etc.); the 46 manufacturers/distributors under PRIA's wing (tires, automotive/industrial, footwear, latex); and of course, the consumers.

What is at ITDI now for the rubber industry?

So far, the rubber testing services offered at ITDI's STD laboratory facilities are the following: load test, compression set, tear resistance, stain resistance, chemical/oil swelling test, specific gravity/density, accelerated weathering, and compression recovery (50T max). ITDI however needs to improve or acquire better equipment and facilities to offer services for abrasion test, tensile, percent elongation, modulus properties, aging tests/degradation test (22h, 48h, 70h, 72h, 96h, 100h, 168h, 335h), International Rubber Hardness Degrees (IRHD)/durometer hardness, and dimension test. Food grade tests and rubber permeation tests, though

DOST-ITDI revives old technology, produces new fruit flakes

The Industrial Technology Development Institute (DOST-ITDI) sees innovation as a never ending challenge, one that is propelled by a continually changing progression of people's needs and wants.

This is what propels the Institute's pool of experts to repeatedly develop new and rediscover old technologies.

To bolster this technology's applicability, ITDI refreshed the know-how in drum-drying. The result is an entirely new and exciting product - fruit flakes from Philippine Carabao mango, banana, and makapuno as base materials.

Drum-drying technology is a process used to remove moisture from pastes, purees, and liquids

using a dryer with a rotating heated drum.

During processing, the equipment is set at low temperature to retain the raw material's organoleptic properties (aspects of food material as experienced by the senses, including taste, sight, smell, and touch), such as, color, aroma, and taste.

The finished product may be finely granulated powder or flakes that can be reconstituted or put back together by adding water or any liquid substitute.

Many are unaware that most food products sold in stores and supermarkets are drum-dried processed. These include milk powder, dehydrated soup mixes, baby foods, and potato additives, such as flour,

granules, and starch.

Drum-drying technology is used in such food products, not only to preserve the natural state of the product's raw ingredients, but also to prolong its usefulness or shelf life. In addition, it eases and speeds up preparation of food, making it convenient to consumers.

Research team leader Elsa Falco said that, "A study on drum-dried products has been done in 1991 at the Food Processing Division (FPD) of ITDI. It was successful and was adopted by a number of takers which produced and sold the drum-dried products. But for unclear reasons, these products have since disappeared in store shelves."



Production of drum-dried mango and makapuno at the FPD Pilot Plant.



Drum-dried mangoes and banana in plastic packages.

ITDI hits... *from p. 1*



MiC Team with DOST Usec. Fortunato dela Peña (L) and ITDI Director Dr. Nuna Almanzor (R)

on food additives and contaminants and metals in water.

With funding from DOST-PCIEERD (Philippine Council for Industry Energy and Emerging Research and Development), the year-long construction of STD's MiC sample preparation and clean rooms for both organic and inorganic analyses were finally completed and are now fully operational.

In addition, an Organic Analysis Proficiency Testing (PT) Material Preparation Room is used for handling and preparation of organic PT samples such as benzoic acid in mango juice and histamine in fish.

Likewise, located in the Organic Analysis Instrumentation Laboratory are the recently acquired triple quad liquid chromatography mass spectrophotometer, time of

flight liquid chromatography mass spectrometer, and microbalance.

An Inorganic Analysis PT Material Preparation Room meanwhile is used for handling and preparing inorganic PT samples such as metals or elemental solutions in water.

A parallel Inorganic Analysis Instrumentation Laboratory is a 100K clean room. It allows particles with a minimum size of 0.5 microns (μm) in a cubic foot of air inside the workspace (One micron is 0.001 mm or 0.00004 inch. A human hair is about 90 μm wide.).

Here, air is repeatedly filtered to remove impurities and particles that can potentially damage sensitive components, hardware, and equipment.

It also houses the flame and electrothermal atomic absorption spectrophotometer (AAS), UV-Vis spectrophotometer for transition metal analysis, and automated chelatometric titrator, among others.

Inside the Nanotechnology Laboratory, on the other hand, are high

resolution field emission transmission electron microscope with high-resolution STEM (Scanning Transmission Electron Microscope) imaging and energy dispersive spectroscopy, and atomic force microscope that provides ultimate performance in non-contact nanoscale metrology, e.g., scanning electron microscope, X-ray diffractometer, and dynamic light scattering particle size analyser (DLS), among others.

A class 100K-certified clean room, it is also electrostatic discharge - compliant.

ITDI is now inviting partners from the academe, industry, and other sectors to join and use its facilities to help advance research studies on nano technology in the country.

Additional equipment for production and processing of nanomaterials and nanocomposites have also been installed. These include programmable vacuum mixer and dispenser, nano-spray dryer, and twin-screw extruder with pelletizer, among others.

With these laboratories, ITDI is assuring industries that it can deliver unique solutions to their challenging design and manufacturing problems.

Better rubber... *from p. 3*

unavailable at STD, can be availed at ITDI's Packaging Technology Division testing facilities. According to PRIA's studies however, some of the services sought by the industry are not yet available in the country, namely ozone resistance weathering tests, rebound resilience, flammability resistance, plasticity retention index for natural rubber, electrical property test (volume resistivity), and ROHS (Restriction of Hazardous Substances). Prices for the rubber testing services have yet to be set and standardized, pending the needed equipment and facility upgrades. Nevertheless, ITDI remains committed and very capable of

accommodating testing requests even with its limited resources.

With ITDI's integrated and upgraded rubber testing facilities, we can help our rubber industry bounce back for better rubber products and standards! For more information on ITDI's rubber testing services, you may contact Ms. Hermelina H. Bion, Chief Science Research Specialist, Standards and Testing Division, Industrial Technology Development Institute, through telephone number (+632) 837-2071 to 82 loc 2197 or via email at std@itdi.dost.gov.ph. (Reginald Roy U. dela Cruz, TSD)

ITDI partners with CHEERS on EFR

ITDI, through its Food Processing Division (FPD), has partnered recently with CHEERS (Community Health Education Emergency Rescue Services) to establish EFR manufacturing facilities.

CHEERS provides quality and innovative community health and safety education, emergency, and rescue services in the country alongside the Private Sector Disaster Management Network.

Two days after signing an agreement, 10 staff of CHEERS underwent a two-day training held at FPD.

A hands-on workshop resulted in an EFR formulation for polvoron, white and milk chocolate nutribars, nutri-pan, and cookies.

These EFR products all contain SAGIP powder made from cassava, camote, mongo, and malunggay. Bland in taste yet highly nutritious,

SAGIP powder is filling and can be added to other foods to make them healthier.

Because the technology relies on community participation, its production is cost-effective and thus more sustainable.

Aside from these, CHEERS also developed other SAGIP-enriched foods, such as EFR/SAGIP mash, EFR bread, donuts, pound cake, cocoa drink mix, veggie burger, noodles, instant chicken soup powder, and local kakanin like kutsinta, puto, bibingka, and ukoy, among others.

Reaching out

Unlike other technologies, EFR initiatives at CHEERS are emotionally rooted. Its co-founder, Sandy Montano, was staying at the Hyatt hotel in Baguio City when it collapsed as a 7.8 magnitude earthquake decimated Northern Luzon in July 1991.

A miraculous survival after being trapped under rubble for more than a week, this harrowing experience was what inspired Montano to establish CHEERS.

She explained however that more than survival, EFR efforts can also provide livelihood opportunities.

For communities to be prepared for emergencies, it needs a steady supply of EFR products. In-house community production of such is thus an ideal setup.

Not only does it empower psychologically and financially, EFR production, as a business, also improves community teamwork, spawning leaders in the process.

As the adage goes, "Getting through tragic circumstances is a real challenge, but a full stomach makes the experience trouble-free thanks to ITDI's SAGIP Nutrifoods." *(Reginald Roy U. dela Cruz, TSD)*

Coconut milk... *from p. 1*



Coconut milk subjected to a Colloid Mill

beverage to quench one's thirst and as additive or flavoring in main dishes, confectionaries, and pastries.

Inopportunately, the local market

only offers coconut milk as additive while little is known about it as beverage.

Hence the move of the Food Processing Division to exploit the use of coconut milk as beverage - one that every Juan can afford and enjoy.

Trial production to develop different coconut milk formulations is a resumption of past studies conducted by FPD in 1987. Albeit successful, adapters were unable to sustain production as time passed.

What used to be rows and rows of coco milk beverage have been scrapped from store shelves.

In the present study, coconut milk is produced using the conventional process. A few modifications on the previous formulation resulted

in a shelf-stable product that can withstand cold temperature and other varying ambient conditions at room temperature.

With the use of new food stabilizers and additives, FPD is now ready to commercialize coco milk beverage, one that is at par in quality and taste with available foreign brands.

The study is currently attracting a group of local stakeholders willing to invest in the product. With the re-invention of this product and its re-establishment in the market, a new milestone in the local coconut industry has again been achieved as coco milk beverage prepares to dominate the international market. *(Delia D. Gotis, TSD)*

'1 AM... *from p. 2*

These particular products have longer shelf life, are ready-to-eat, and require minimal preparation.

With durable packaging, these can withstand great force from being airdropped in disaster zones at altitudes of 800 to 1,000 feet.

An initially developed RTE variant, chicken arroz caldo,

has a shelf life of nearly a year. It will be ready for delivery to disaster-affected areas as soon as field tests and validation study results are completed.

Other variants in several development and test stages are chicken adobo rice meal, beef tapa rice meal, and corn soup. *(Reginald Roy U. dela Cruz, TSD)*

DOST-ITDI... *from p. 4*

She affirmed, however, that *"We have seen the market potential of currently available and similarly processed fruit products. This is why we have decided to revive the technology and remake fruit-based confectionary products, specifically mango, banana, and makapuno into fruit flakes. With this, our stakeholders are assured of steady profit. Now, these fruits can level-up to the market status of similar products such as dried mango and soursop or guyabano."*

With funding assistance from DOST-PCIEERD, the team revalidated all research data generated in the past and used the same parameters to successfully reproduce flaked mango, banana, and makapuno. An adopter is currently ready to venture into the fruit flakes business.

Meanwhile, ITDI experts are working to re-study production of a more stable coconut milk product comparable to the quality of imported items. Tirelessly exploring and re-discovering, they continue to bring people breakthroughs of

the future.

Aside from conducting in-house research studies, FPD also caters to industries' and individual's research needs on food product development; process development/improvement; and shelf-life testing. To avail of these services, call or visit Engr. Melchor C. Valdecañas, Chief, Food Processing Division at telephone # (632) 837-2071 to 82 loc. 2187 or Email fpd@dost.gov.ph. (*Delia D. Gotis, TSD with report from Christian U. Contado, FPD*)

Profile... *from p. 8*

National Brick Program, and Low-Cost Laundry Soap Program.

She also led in establishing the Philippine Metrology Society which paved the way to the enactment of the Philippine Metrology Law and the ISO accreditation of ITDI and its three laboratories.

Her being at the helm for nine years led to achievement of several milestones which entrenched the Institute as a central partner of DOST in its mission to make life better for Filipinos.

Innovative and cutting edge research programs and smarter technologies were presented as drivers of growth in cities and the countryside.

These included establishment of ADMATEL (Advanced Device and Materials Testing Laboratory), a MiC Laboratory (Metrology in Chemistry) integrated with rubber testing facilities, a Nanotechnology Laboratory, and enhancement of the National Metrology Laboratory.

These made ITDI one of the premier standards and testing centers of the country.

An incessant drive to make research results practical and functional saw growth and improvement of existing business firms and creation of new ones.

Don't be mistaken though. While she's at the center of all these 'hard' pursuits, Boss Nu is one who is not at all shy to drop formalities.

And if one wants to get a glimpse of her 'soft spot', just hop on a trip with her and you're in for the unexpected. A real trooper, she can be your 'barkada' eating with the group anything that is on the 'spread'.

She'll even buy you 'nilagang mais' or 'turon' along the way. Her concern for employees can be seen through the Molino Housing Project. And while her list of achievements can go on, this tireless lady humbly acknowledges the support of everyone.

With these achievements which are by no means, ordinary, Dr. Almanzor has also been awarded the following: Excellence Award by the Philippine Technological Council (a conglomeration of 40 professional associations); UST Outstanding Alumni for Government Service in 2008 during its Centennial Year of the Faculty of Engineering; Outstanding PhilJAPA Fellow for Public Administration; Outstanding Personality and Socio-Civic Leader by the Asia-Pacific Youth Outreach Development Inc.; and British Council Fellow.

Always a busy body, apart from work she is also an active member of various organizations like the Philippine National Consultative Committee for Standards and Quality (PNCSQ) of the BPS; Philippine Panel of Experts from APEC-International Quality Assurance System; and is currently the Philippine Focal Person to the ASEAN Sub-Committee on Food Science and Technology.

While she used to sit as Past President of the Philippine Institute of Chemical Engineers (PIChE) and was founding President of the DOST-PIChE Chapter, Boss Nu continues her membership at PhilAAS and Women in Science and Technology Foundation to name a few.

She also finds time to share her knowledge and experiences through her papers and as resource person in various S&T fora and conferences, among others.

In all of these, Boss Nu will surely be most remembered for her selfless service, passion, and commitment in rallying behind ITDI in creating and generating technologies and innovations that never fail to improve the lives of those we serve.

And on your retirement, *"take time to smell the roses, or a pot of freshly brewed coffee. Sit on the patio and listen to the rustle of the trees' leaves, a bird's call... be still and just listen. It's the little things in life, not just the hustle and bustle of life itself... that makes it all meaningful."* (from retirement-online.com)

profile

Dr. NUNA E. ALMANZOR ITDI's First Lady Director



"Thank God every day when you get up that you have something to do that day which must be done whether you like it or not. Being forced to work and forced to do your best will breed in you temperance and self-control, diligence and strength of will, cheerfulness and content, and a hundred virtues which the idle will never know". (Basil Carpenter)

"If you believe that achievement ends with retirement, you will slowly fade away. First of all, keeping the mind active is one way to prolong your life and to enjoy life to its fullest for as long as possible." (Byron Pulsifer, End of Achievement)

Two quotes that describe how the first Lady Director of ITDI for nine years, now about to retire from service, conducts her day.

Being a workaholic as her wont, she doesn't mince her words in order to get things done of one's free will or by force (tsk! tsk!). Through the years, she has emerged strong and cheerful along with her staff and colleagues. But not one to stop at that she still has what it takes to keep going and let loose, never wanting to fade away even in retirement.

What a lady!

In retrospect, Dr. Nuna E. Almanzor, fondly called by most as Ma'am Nu or Boss Nu at ITDI, joined DOST, then NSDB, as a young graduate of the Bachelor of Science program in Chemical Engineering from the University of Santo Tomas back in 1972.

Among the Top 10 in the board licensure exam, she nonetheless started from the ranks, slowly inching

her way up the ladder. At NSDB, she led in evaluating projects, meeting various researchers and personalities along the way.

While on the job, she pursued advanced education and earned her MBA from the Philippine Christian University and PhD in Business Management from the Philippine Women's University.

She then pursued a postgraduate course in Chemical Engineering at the Tokyo Institute of Technology, Tokyo, Japan as a UNESCO scholar.

From NSDB, she transferred to ITDI where her leadership and managerial aptitude were further honed.

At ITDI, this true-blue Batangueña ably handled the toughest jobs, even those meant for men, for that matter.

Her trainings here and abroad molded her further into becoming the first Lady Director of ITDI, more than a century later of having men in command.

Of these trainings, the more notable were: Industry and Environmental Protection for the Philippines of the AOTS Program; Small and Medium Enterprise Development by JICA; Technology Transfer at Straclyde University in Scotland; Technology Transfer and Socio-Economic Development of the Euro-Asia INSEAD Program; and Technology Management of the ASEAN-USAID-AIT Program.

Ever the ardent partner of the Department in its mission of attaining global competitiveness for our local industries and providing livelihood opportunities in communities, this tireless lady led the Institute to being named as DOST-NRCP's first Outstanding Institution in 2011, besting other national agencies for the award.

During her leadership, she spearheaded conceptualization and implementation of various winning programs such as Technology Business Incubators or TBI,



Our Business Is Industry



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The official Newsletter of the
Industrial Technology Development Institute, DOST
published semi-annually

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