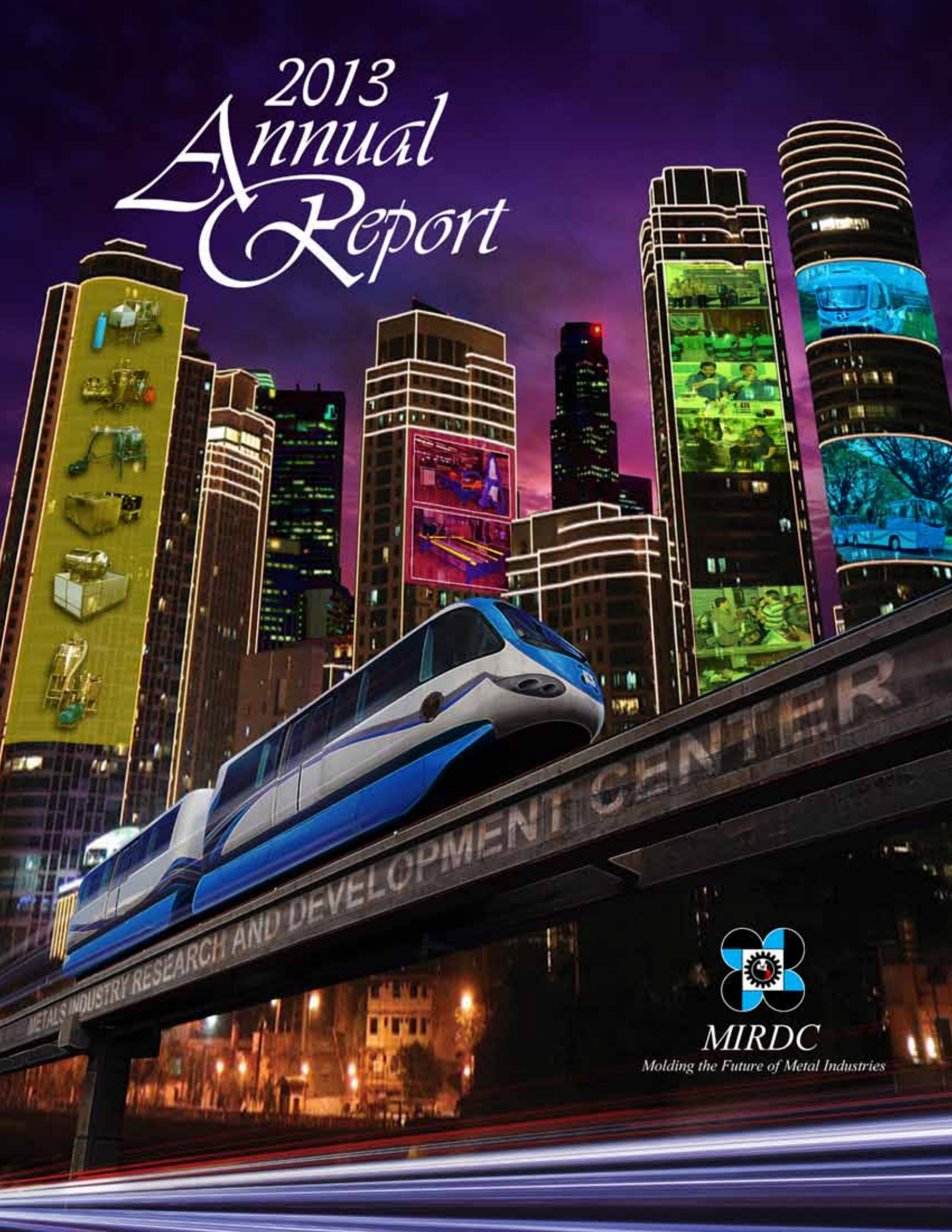
2013 Annual Report



MIRDC

Molding the Future of Metal Industries

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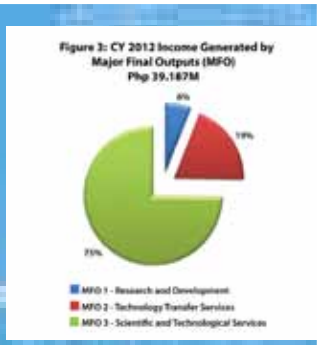


Message from the DOST Secretary

2013 has added another impressive year to the Metals Industry Research and Development Center's rich history of successes. It truly makes the entire family of the Department of Science and Technology proud of all that MIRDC continuously achieve.

In our pursuit of a Smarter Philippines, I strongly believe that science, technology and innovation play a major role and are truly the key components in achieving success. The undertakings of the DOST are thus largely anchored on using S&T outcomes for the benefit of the nation and of Filipinos wherever they are in the world.

I am especially thankful to the MIRDC for the support it has been giving to the plans and programs of the DOST. The expertise, dedication, and hard work of the men and women of the Center help the DOST deliver all that it needs for the service of the country. It is through your unwavering efforts that we are able to identify priority areas, focus on the most pressing need, and carve out ways in order to offer solutions that are not only significant, but are long-term as well.

I encourage each and every employee of the Center to keep the determination alive and strong. The MIRDC's achievements in all these years indicate a burning passion to excel. Let these achievements be your guide and motivation. You have chosen to go the right path, and so you must also lead the way. We should not rest and be complacent recognizing that there is more to do and achieve - we must keep reaching for more so that we can serve more. Most important of all, use your successes as your challenge. You can always do better. You can create bigger impacts.

Congratulations to the MIRDC for a fruitful 2013. More challenges are bound to come your way, but you have the DOST's strongest faith – we believe in what the Center can do, we recognize your capabilities and we count on your strong commitment to take the country toward growth and progress.

MARIO G. MONTEJO
Secretary, DOST
and Chairperson, MIRDC Governing Council

Message from the OIC - MIRDC

Motivated to keep reaching for performance excellence, the Metals Industry Research and Development Center remains committed to face challenges every day. It is this commitment that inspires the MIRDC to undertake activities that will benefit each and every Juan. The Center's undertakings for the year 2013 have resulted to learning and rewarding experiences.

Supportive to the government's quest for growth and development of the nation, programs and projects aimed to provide answers to pressing issues involving the M&E industries are implemented by the Center. These are the MIRDC's expression of unwavering determination to uplift the global competitiveness of one of the essential drivers of the country's economic progress.

This Annual Report gives a rundown of highlights of the year 2013, which are products of determined efforts of various divisions and project teams. Agricultural mechanization, finding alternative solutions to traffic and other transportation-related problems, creating a business-enabling environment for the micro, small, and medium enterprises, and gaining capabilities in machine-building are some of the initiatives that have kept us going this year. Furthermore, the Center also put in efforts to help in disaster mitigation and in training the workforce.

With all these efforts, we want to help the M&E industries make a statement – we are gearing up for bigger challenges in the coming years. We want to be instrumental in making the Philippines self-sufficient and there is no better time to begin than now. All it takes is an unwavering commitment to reach the goal. The divisions that make up the MIRDC are bonded together with the shared vision of advancing the performance of the M&E industries. Our individual roles are undoubtedly very important, but it is this shared vision that unites us and enables us to act as one so that the MIRDC will continuously serve and give significant contribution to the nation.

It is with so much pride that I present to you the 2013 Annual Report. May this serve as an inspiration to all of us to continue to do meaningful public service. Let us not lose sight of what we want to achieve and let us do what it takes to make things happen.

ROBERT O. DIZON
Assistant Secretary, DOST
and Officer-in-Charge, MIRDC

Vision

An internationally recognized institution providing research and development, technology transfer, and scientific and technological services supporting the growth and global competitiveness of the metals, engineering, and allied industries.

Mission

To provide both government and private sectors in the metals and engineering industry with professional management and technical expertise on the training of engineers and technicians; information exchange; trade accreditation services; quality control and testing of metal products; research and development; and business economics advisory services.

Core Values

e***M***powerment
- We get the job done and make things happen.
- We derive our collective success from individual strengths and capabilities.

Integrity
- We do what is right even when no one is looking.
- We act responsively, work honestly, and encourage transparency.

Respect
- We demonstrate justness and fairness in all we do.
- We value diversity and view another person as an individual of fundamental worth.

Dynamism
- We perform our jobs with vigor and enthusiasm.
- We welcome change as an opportunity for growth and continual improvement.

Commitment
- We are passionate at what we do.
- We dedicate ourselves to the achievement of our vision, mission and goals.

QUALITY & ENVIRONMENTAL POLICY

We are committed to provide products and services to both the government and the private sectors in the metals and engineering and allied industries with the highest standards of quality and reliability within our capabilities and resources and to continually improve the effectiveness of our Quality and Environmental Management Systems at all times in order to meet customer satisfaction.

We shall manage and control our activities in order to minimize adverse impacts on the environment, prevent pollution and safeguard the health and safety of all employees, stakeholders, customers, suppliers and the surrounding community.

To fulfill these commitments, we shall:

- Adopt new and appropriate technologies and processes to continually improve the quality of our products and services and our environmental performance;
- Implement programs to enhance the competency and awareness of all personnel;
- Promote quality and environmental awareness and health and safety practices in all levels of the Center;
- Comply with all applicable laws and regulations in the country including the requirements of DOST, customers, stakeholders, industry in which we subscribe to;
- Reduce dependence on the use of toxic and hazardous substances, including Ozone Depleting Substance (ODS);
- Implement an effective waste management and waste reduction program including where practicable, recycling and reusing of wastes; and
- Optimize the use of resources by continually identifying, implementing and reviewing practical measures to reduce resources usage.

RESEARCH and DEVELOPMENT

prototyping division

Metals Industry Research and Development Center

The 2013 marks an eventful year for the Prototyping Division (PD) as the MIRDC heightened the Makinarya at Teknolohiya para sa Bayan (MAKIBAYAN) Program geared towards enhancing the productivity and competitiveness of the Metals and Engineering (M&E) industries. Significantly, the PD has spearheaded the implementation of the MAKIBAYAN program through the conduct of research and development (R&D) in machine building and localization, advanced transport, as well as the setting up of advanced manufacturing facilities.

During the period in review, 56 R&D projects were implemented particularly in the fields of components/parts designing, CNC machining, food processing and production, disaster mitigation, and agricultural mechanization. Of these, seven (7) patent applications have already been filed and one (1) application for Intellectual Property Rights (IPR) protection was approved. The aforementioned R&D projects are primarily aimed at developing appropriate technologies for the SMEs to create growth in the countryside and providing solutions to pressing national problems.

Aside from providing technical support to other operating units of the Center in implementing various training and consultancy activities, the PD has rendered 449 services in designing, machining, welding or fabrication involving 101 clients/companies and generated for the Center an income of more than PhP 2.6 million.

The PD is also continuously undergoing rapid enhancement of its R&D laboratories and workshops in support to competitiveness of local industries for the One ASEAN Community. With the advent of global competition and complementation, the PD is establishing more than PhP 200M-worth of advanced manufacturing facilities on finite element analysis (FEA) and tool, die and mold designing and making with specialized technical human resources, advanced equipment, and superior technologies to meet the demands of present times as well as cope with the rapid changes in technology brought about by the developments in other Asian countries and more so in highly industrialized countries. These strategic initiatives are intended to harness advance and emerging technologies and boost industry and national competitiveness.

Setting up of new facilities on CNC Gear Making and Advanced Welding and Fabrication is underway. With these load of improvements and developments, we envision that 2014 will be a more challenging exciting year for the PD.

MACHINE BUILDING FOR NATION BUILDING

Advancement in Machine Building Capability through the Development of a CNC Laser Machine and Improvement of the CNC Router with the Addition of Automatic Tool Changer (ATC)

The Makibayan is a program that aims to provide a more enabling environment which will spur growth in the metalworking and other related industries. Several projects under the program are undertaken to provide solutions to industry problems and develop needed machineries and technologies locally. Some projects, such as the development of the CNC Router and CNC Plasma Cutter, are specifically done to enhance the productivity and competitiveness of the metals and engineering industry.

CNC LASER cutting is an industrial technology that uses high-power laser beam to cut materials like steel, acrylic and other materials. The cutting produced from LASER leaves a polished, finished edge without further work required thus making intricate cuts easier and more efficient. However, acquisition of such machine entails a high cost and the technology calls for sufficient knowledge and skills on CNC operation. It is for these reasons that the MIRDC and the DOST-PMEDSO developed and fabricated the local CNC Router and CNC Plasma Cutter. Although the development of the said machines was successfully done, additional improvements are still needed. Hence this project titled "Advancement in Machine Building Capability through the Development of a CNC Laser Machine and Improvement of the CNC Router with the Addition of Automatic Tool Changer."

The project's main objective is to develop a low-cost CNC Laser Machine and enhance the accuracy and machining time of CNC operations. The first part of this project focuses on the development of CNC Laser machine for high precision machining having an accuracy of +/- 0.1 mm and cutting capacity of up to 12 mm, 2 mm, and 1 mm for acrylic, mild steel, and stainless steel materials, respectively. The CNC Laser being developed will increase the

Addition of an Automatic Tool Changer for the CNC Router


Project Team with DOST Secretary Mario J. Montejo

system's accuracy by up to five times and will reduce machining time by up to ten times. It will also achieve greater precision by reducing the chances of warping the material being cut since laser systems have a small heat-affected zone as compared to CNC plasma cutter.

Fabrication of mechanical components is almost complete including the machine guard, work piece delivery and CNC table. A CNC USB Controller will be used for the system controls to drive the three Ezi-Servo motors and the 200-W Synrad LASER generator.

The second part of this project involves the integration of an ATC to the existing CNC Router. The current setup of the CNC Router utilizes manual tool change operations wherein the CNC operator manually calibrates and replaces every tool. The ATC will incorporate an eight-position straight linear-type tool holder which will make the CNC router adaptable and flexible to different routing operations. It also uses a pneumatic electrospindle as replacement of a conventional spindle.

With an ATC, the cycle time of tool-change operations is significantly reduced thus improving machine productivity. Complex machining that requires different tooling is allowed, making different types of cuts possible. Moreover, the user's safety during tool change operations is ensured.

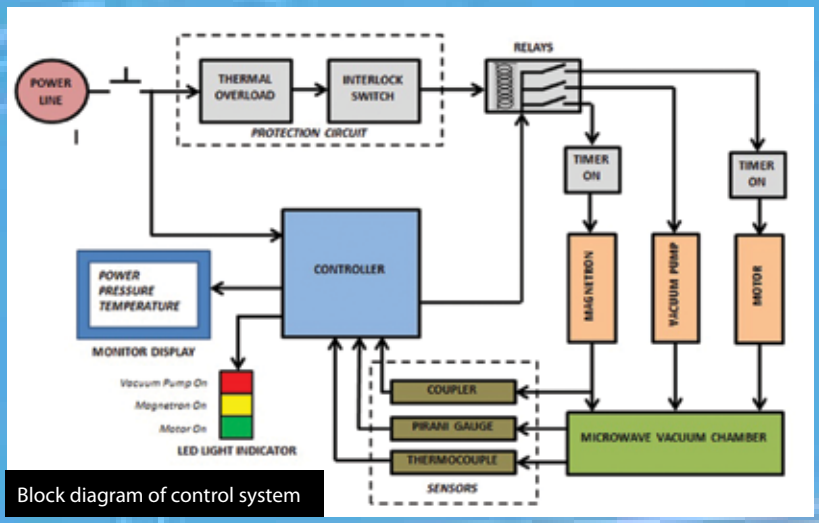
Design and Development of a Local Microwave Vacuum Dryer

Microwave vacuum drying is, at present, one of the modern technologies of food drying. Through the use of microwave energy inside a vacuum environment, current problems taking place in conventional dryers such as long drying time and scorching are considerably addressed. Although this technology is already available for export in some countries such as China and Germany, development of its local equivalent is of great advantage as it can lower the cost significantly relative to importation.

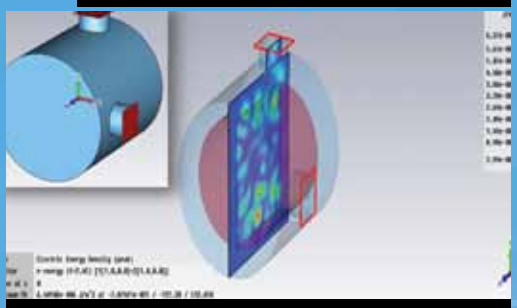
Generally, this two-year project aims to design and develop a local microwave vacuum dryer for the stabilization of finer-grade rice bran as an


Design of microwave vacuum chamber


Fully-furnished microwave vacuum chamber



Block diagram of control system


Simulation of energy distribution inside the chamber using CST-Studio


Roaster


Winnower


Grinder/Refiner


Melanguer

incorporation in pasteurized and sterilized emulsion-type meat/fish system. Rice bran has been found to be a good source of protein, thus, regarded as an excellent additive for food and pharmaceutical applications.

For the first year of the project, the MIRDC team together with DOST-PMEDSO developed a design of a microwave vacuum chamber and its fabrication has already been completed. Using CST-Studio Software, the proper location of microwave source was established and uniform energy distribution was achieved. Concurrently, the MIRDC team initiated the development of the controls for the whole system which will be actuated using Programmable Logic Controller (PLC). Human Machine Interface will also be integrated in the controls for real-time monitoring of vital parameters. The whole architecture was finalized and will be realized on the second year of the project in 2014.

Design and Fabrication of Equipment for the Production of Local Cacao and Cocoa Industry

Cacao, a high value commercial crop in the Philippines, has a huge potential for production expansion. This is particularly expected in Davao Region as it has the best areas and ideal conditions for cacao farms to thrive. According to Dr. Smilja Lambert, a Norwegian consultant with Mars Cocoa Inc., the Philippines has the capability and the best conditions to become a major cocoa producer, if production is increased to supply 100,000 metric tons to the world market by the year 2020. Mars Cocoa Inc. is one of the world's biggest buyers of cocoa.

This is a challenge to the cocoa industry which DOST is now addressing through four (4) different projects including the "Project 4. Design and Fabrication of Equipment for the Production of Local Cocoa Products." For the first year of the project in 2013, four (4) traditional cacao processing machines were designed by the Industrial Technology Development Institute (ITDI) and fabricated at the MIRDC consisting of the following:

1. The ***Roaster*** cooks the cacao beans by roasting to develop the expected color and flavor of chocolate. The even and gentle roasting is most desired to accomplish the full development of flavor. Roasting also renders the outer shell of the cacao beans brittle in preparation for the next process which is winnowing.

2. The ***Winnower*** removes the outer shell and breaks the exposed cocoa bean meat into small pieces termed as "cocoa nibs." These are then passed on to a series of sieves for straining and sorting.

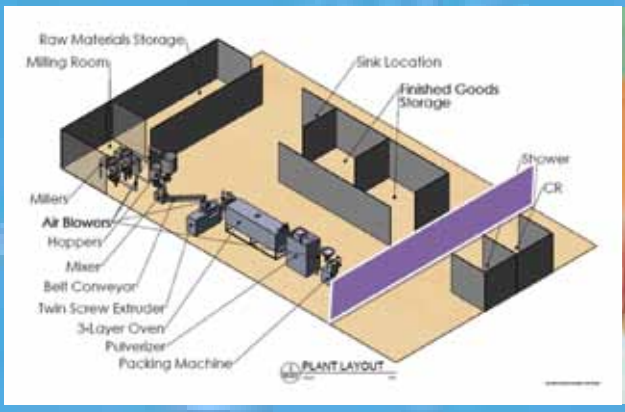
3. The ***Grinder/Refiner*** is used to ground the cocoa nibs into "cocoa liquor," the unsweetened chocolate or cocoa mass. The heat generated by grinding is responsible for turning the cocoa nib into liquid. This liquid contains a high amount of fat melted from the nibs with dry granular consistency. It is also in this stage that the mixing of ingredients takes place. For instance, fresh, sweetened, condensed or roller-dry low heat powdered whole milk is added to produce milk chocolate.

4. The ***Melanguer*** continuously blends the mixture to refine and bring the particle size of added ingredients, like milk and sugar, to the required texture. At this stage, the chocolate mass is sheared into a smaller particle size. If the particles are too large it will result in a coarse mouth-feel. On the other hand, too small particles may result to a mixture that is very sticky to the palate.

In the succeeding year 2014, the project is expected to come up with the prototype equipment for the production of cocoa liquor, butter and powder. The specific prototypes to be fabricated include sorting equipment, pulverizer, filter conching equipment, tempering equipment, pressing equipment and table molder for tablea. Each of these prototypes will perform specific functions that will aid in a more efficient processing of cocoa by-products.

Establishment of Complementary Baby Food Production Plant

Baby food is any food, other than breast-milk or infant formula, which is made specifically for infants, between



the ages of four to six months to two (2) years. These are alternative foods for infants to keep them well-nourished and healthy. They can be made at home but with the increasing number of working mothers, such activity is tiring and time-consuming. With this scenario, problems on malnutrition can occur.

In view of this, the MIRDC as the implementing agency, in close collaboration with the Food and Nutrition Research Institute (FNRI), DOST-National Capital Region (DOST-NCR),ITDI and concerned Local Government Unit (LGU), conceptualized a project titled "Establishment of Complementary Baby Food Production Plant." This is to encourage LGUs to adopt and implement DOST's technological innovations and improvements in support of the LGUs programs to enhance the quality of life and well-being of its constituents.

Well-nourished children are essential to achieving a progressive Philippine economy. The project is very significant not only forproducing baby foods for infants and babies, but they also very much suited for the elderly, the sick or disabled persons who have difficulty in eating. In addition, being a country frequently experiencing calamities such as typhoons and earthquakes, baby foods are good relief items.

Baby food manufacturing is also a method of preserving foods particularly fruits and vegetables. Processing them during abundant season will highly benefit the farmers. This project will also benefit the local fabricator shops, agricultural sector as supplier of raw materials, and food manufacturers.

This integrated/automated plant can produce around 720 kg/day of instant baby food blend (e.g., rice-mongo) and will be consisting of a full complement of food processing equipment such as the pulverizing machines for grinding rice and mongo, mixer with built-in water atomizer, twin screw extruder, three-layer conveyorized dryer, pulverizing machine with suction bag, and powder packaging machines, among others.

Roll-out of DOST-Developed Food Processing Equipment to the Regions

Food processing firms (FPF) are recognized to be the prime movers of the country's economic growth. FPFs provide a reliable and equitable basis for economic development as experienced by most successful and newly-industrialized countries in the world. However, technology-based food processors in the country are confronted with barriers with regard to access to information, capital and high cost of equipment.

In 2011-2012, the DOST implemented a project on the development of process equipment for food processing firms which aimed to develop locally-fabricated equipment for the food processing industry sector. This project, implemented by the ITDI as the lead agency, together with the DOST-PMEDSO and the MIRDC, was conceived to promote locally-developed technologies or Filipino innovation and help catalyze industry development through S&T intervention on localized fabrication of food processing equipment.

Five (5) food processing equipment were field tested in 2013 and are now ready for roll-out and commercialization. Initial deployment will be done early in 2014 to the identified Food Innovation Centers (FICs) all over the country, e.g., Regions 2, 5, 6, 7, 8, 9, 10, 11 and NCR. The establishment of the FICs is an initiative of the DOST to enable and capacitate food processing firms in various regions to do a strate-


Freeze Dryer


Vacuum Fryer


Vacuum Packaging


Water Retort


Spray Dryer

gic leap for global competitiveness. FICs intend to provide and/or promote appropriate technologies, such as the locally-fabricated food processing equipment, vital to the advancement of the local food industry and facilitate inclusive growth in the country.

The Freeze Dryer is a bench-top model and could be used for research and/or micro scale processing. It consists of a vacuum chamber which accommodates five adjustable trays with heater. It has a condensing capacity of four liters and applies natural defrosting. The control panel incorporates light indicators for heaters, vacuum pump, condensing unit and displays temperature and vacuum parameters digitally.

The Vacuum Fryer is used for deep-fat frying of food materials. It cooks the foods by frying in oil inside a vacuum chamber wherein both oil temperature and pressure are low. The equipment allows frying of materials that are not normally fried in oil, e.g., jackfruit, mangoes, root crops, vegetables, squid. Vacuum-fried products are crispy. They also contain low fat and high fiber.

The Vacuum Packaging Machine is used in vacuum sealing of food products in retortable pouches to store the food in minimum-air-environment, preventing the growth of microorganisms and protecting the food from spoiling, thereby extending the shelf life of food significantly. The use of the machine results to long-term storage of dry foods such as cereals, nuts, cured meats, cheese, smoked fish, coffee and potato chips. It is also used to preserve/pack vegetables, meats and liquids in a shorter term.

The Water Retort is used to increase the shelf life of processed foods. It is a batch-type, non-agitating vertical pressure vessel used to process foods packed in sealed containers, e.g., cans, jars or retortable pouches. It uses water contained in a vessel as heating medium for thermal processing. Water is heated underneath the vessel using a high pressure LPG burner. Compressed air or additional steam is introduced during the processing cycle to provide the counter-pressure needed to prevent package damage or loss of seal integrity caused by bursting during the heating and cooling process.

The Spray Dryer is used for efficient drying of thermally-sensitive materials such as food solutions, slurry paste gel or suspensions. It has two fluid atomizers wherein compressed air is used to atomize the liquid feedstock.

Improvement of Process Equipment for Food Processing Firms

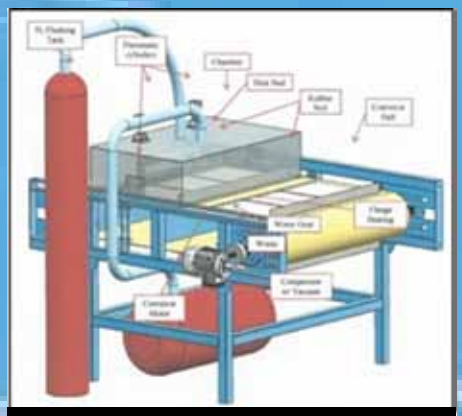
The project "Improvement of Process Equipment for Food Processing Firms" was conceived to promote locally-developed technologies for Filipino innovation addressing the needs and problems of food processing industry/sector and nutrition in the country. It supports the DOST High Impact Technology Solutions (HITS) under the new leadership of the DOST focused towards recognizing equipment needs that will enhance the performance and productivity of FPFs.

This involves the enhancement of existing batch-type prototype equipment such as Immersion Freezer, Vacuum Packaging Machine and Vacuum Fryer in order to substitute imports and making them affordable and appropriate for local food processing firms. Aside from this, the said food processing equipment will increase productivity and efficiency through continuous operation and lower cost. These advantages will lead to the food processing sector's increased competitiveness.

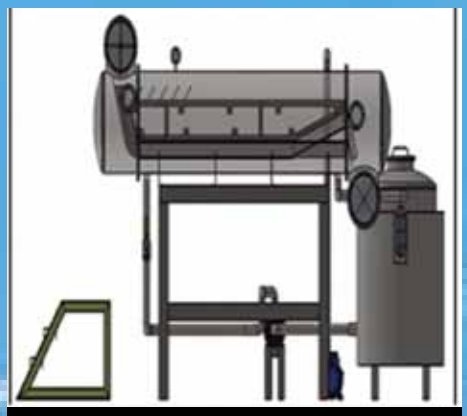
The Vacuum Packaging Machine is applied in vacuum sealing of food products in retortable pouches. It is mainly used for storing marine meat, dried fruits and other food products in an environment with minimum or no air to prevent the growth of microorganisms, extending the food product's shelf life and preventing spoilage. Likewise, the quality, flavor and color of food are maintained through the use of this equipment.

The Immersion Freezer with a capacity of 45 kg/hr will be used for freezing food material packed in appropriate package while immersed in low temperature. This machine prolongs the length of the food product's storage, making the preservation process more effective.

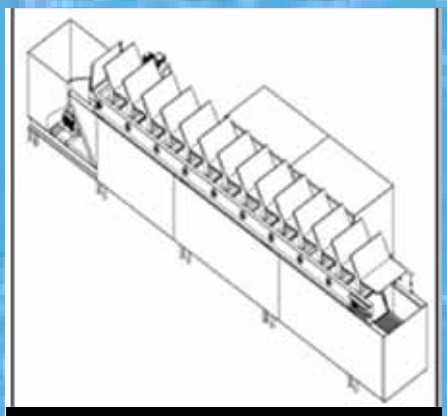
The 60 kg/hr capacity Vacuum Fryer is a deep-frying device devel-



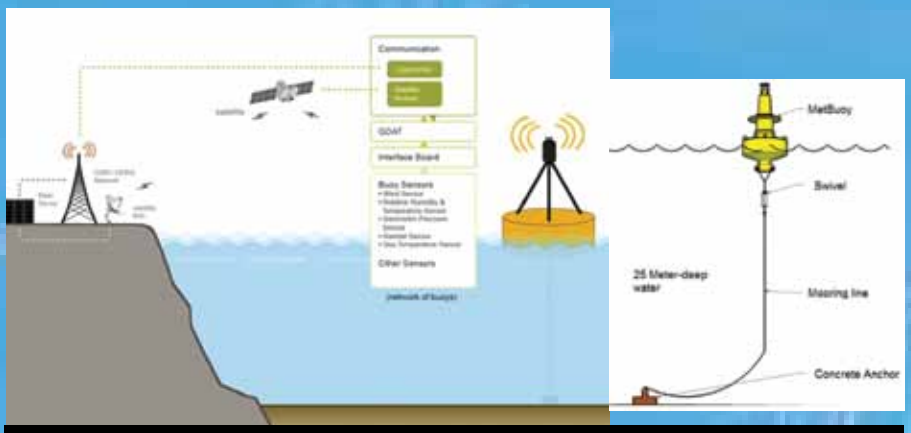
Continuous Vacuum Packaging Machine



Continuous Vacuum Fryer



Continuous Immersion Freezer



Communication of data from MetBuoy to ASTI server by satellite Schematic MetBuoy Assy. GSM networks.

oped for production of high quality fruit and vegetable through the reduction of moisture content of food. This improved equipment is designed for easier operation, like ordinary frying in a low pressure level. Field testing of the said equipment is scheduled on the latter part of 2014.

Development of a Low-Cost and Locally-Designed Meteorological Buoy (Metbuoy)

This project is in support of the efforts of the DOST-PAGASA in modernizing ocean observation and weather forecasting facilities by developing a meteorological buoy system that will monitor the changes at sea especially during extreme bad weather conditions, and provide accurate and timely information to help prevent sea accidents and tragedies.

The Advanced Science and Technology Institute (ASTI), together with the DOST-PMEDSO and the MIRDC, developed two MetBuoy prototypes with different hull material. Protoype 1 is made of mild steel plate. It generally consists of a superstructure at the top that bears the instrumentation except for the sea temperature sensor; the hull, which is at the middle, supports the superstructure to which the sea temperature sensor is attached through the submerged bottom; and the mooring assembly which stabilizes and restrains the MetBuoy. Prototype 2, a thinner and lighter version, is made of stainless steel sheet and has the same configuration and properties as Prototype 1.

The pre-deployment test was conducted in Corregidor Island for both prototypes and results showed their successful performance. Automatic data transmission to the ASTI server in Quezon City was also successful. Favorable results of the pre-deployment activities warrant final deployment of the prototypes in Matnog, Sorsogon and Aborlan, Palawan by the second quarter of 2014.

Development of High Capacity Water Hyacinth Harvester

As a sequel to the locally-fabricated "Harvester I" that can reap water hyacinths from river waters, the DOST is returning with an upgraded version. This new "High Capacity Water Hyacinth Harvester" is named as "Harvester II," with an improved overall performance than its predecessor for more efficient harvesting. It was persistently developed to address flooding which is caused by the clogging of waterways by water hyacinth or water lily and other aquatic plants and weeds.

Harvester II is the second prototype which aims to improve the performance, stability, collection rate, storage capacity, controls and operation, aesthetics, and transit speed based on the learnings from the first prototype. The vessel is still an inclined conveyor type with stainless steel mesh-type front conveyor system. It was developed with the design from collective

High Capacity Water Hyacinth Harvester.

Pre-deployment Test of Prototypes 1 and 2 at Corregidor Island.

ideas of the teams from the MIRDC, the DOST-PMEDSO, the Society of Naval Architects and Marine Engineers (SONAME) and the Metalworking Industries Association of the Philippines (MIAP).

The Harvester II has a collection rate of 250 kilograms in five (5) minutes, can operate at a depth of 0.5 meter and with a transit speed of 2.9 knots. Currently, the Harvester II is deployed at Bayanan, Muntinlupa City with assistance from the Muntinlupa Lake Management Office (LMO). Towards the end of 2013, final testing of the unit was nearly completed in time for its deployment to the agreed and approved location by the second quarter of 2014.

Improvement of Flood Control Facility through the Development of Automatic Trash Rake

For the past years, the country is plagued with various calamities claiming the lives of many. These unrelenting incidents resulted to a tall order from the national government urging local authorities to become more vigilant to disaster preparedness measures to help mitigate the damage to life and property arising from calamities. According to the recent Mortality Rate Index (MRI) released by the United Nations' International Strategy for Disaster Reduction (UNISDR), the Philippines ranks 12th in a list of 200 countries whose populations are at-risk from natural hazards such as earthquakes, floods, typhoons and landslides (Ubac, PDI, 17 June 2009). On the other hand, in the Annual Disaster Statistical Review 2008, the Philippines ranks 3rd in the world as far as the number of disaster events reported in 2008. The reports only show that the Philippines is truly one of the world's most disaster-prone countries. As an action to the flooding caused by excessive garbage in waterways, the DOST has taken the initiative to develop a solution to collect garbage from upstream creeks going to the major creek of San Juan River.

The Automatic Trash Rake (ATR) is designed with an inclined conveyor type of garbage collection mechanism installed at the center of the creek. This fully automatic system economically replaces the manual collection of garbage, which is still the most common method of garbage maintenance. The ATR also handles debris with great efficiency and reduces maintenance and labor costs because it can be manned by just one to two persons. The ATR facility consists of a covered garbage chute on a platform that is levelled to the base of a truck which makes it easy for the operator to transfer the collected trash to the transport truck manually by using a shovel. Also, collected garbage from the rake can be received directly by the truck. Since the facility is automated, the safety of the operator is another benefit. Manual trash-raking is inherently risky, and automated systems reduce that risk.

The ATR facility was developed by the MIRDC and the DOST-PMEDSO together with group of engineers from Quezon City's Department of Engineering (DOE), Special Design Group (SDG), Environmental Protection and Waste

Project Team w/ LGU-QC & Mayor Herbert Bautista

Project Team w/ QC-SGD, EPWMD, & TW

Management Department (EPWMD), and Task Force Waterways (TFW). The design of the ATR has been completed and the construction of the facility is expected to be completed before the rainy season comes in July 2014

Development of a Fluidized Bed Dryer for Production of Stabilized Brown Rice

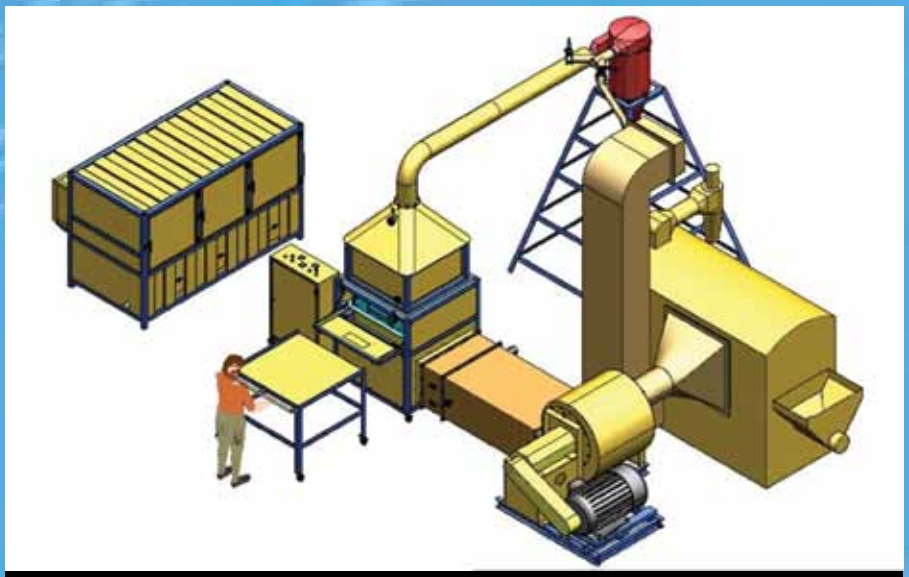
The shift to brown rice is one of the solutions identified to achieve rice self-sufficiency in the country. Brown or unpolished rice is basically any variety of rice that has been dried, cleaned and milled with only the husk removed, thus leaving the rice kernel coated with bran layer. Despite its nutritional advantages and potential of reducing the country's rice importation, brown rice cannot fully proliferate into the market mainly because of its short shelf life.

The Food and Nutrition Research Institute (FNRI) found out through experimentation that a combination of steaming and drying is an effective method of increasing the shelf life of brown rice by five to nine months. Fluidized bed drying is one of the methods employed by the FNRI to produce stabilized brown rice.

ciple of fluidization such that when a solid particulate substance is placed under appropriate conditions, the solid-fluid mixture behaves as fluid. The advantage of fluidized bed dryer over other types of dryers is that the fluidized bed unit suspends the materials in the heated air 100% of the time, thereby causing uniform drying. Fluidized bed dryers are particularly suited for drying high moisture grains such as paddy, parboiled rice, maize and soybean. Its drying rate is very fast as compared to conventional grain dryers; size of the drying unit is very compact relative to its capacity; and energy consumption is relatively low while maintaining grain quality. The technology of fluidized bed drying is already established and fully commercialized in several countries such as Thailand, Vietnam and China, among others. These commercially-available fluidized bed dryers are usually for large-scale drying.

The DOST project entitled "Development of Fluidized Bed Dryer (FBD) for Production of Stabilized Brown Rice" aims to design and fabricate a low cost prototype batch-type and continuous-type fluidized bed dryer for production of stabilized brown rice with prolonged shelf life. The prototype to be developed but a smaller-scale drying will be considered. The batch-type fluidized bed dryer will be designed for a 50-kg per batch operation while the continuous-type will be for a one-ton per hour drying operation.

On its first year in 2013, benchmarking activities documenting several fluidized bed dryers in the country such as the FBD System of LMG Rice Mill in Roxas, Oriental Mindoro; Mindanao Grain Processing Co. Inc. in Reina Mercedes, Isabela; and the FNRI-DOST in Taguig City were conducted to facilitate in-depth understanding of the technology and effective design of a re-



System design of batch-type fluidized bed dryer system prototype.

Benchmarking activities to companies with existing fluidized bed dryers.

team also met with several agricultural machinery manufacturers to gather additional information on the design, operation and economic aspect of FBD systems. The information gathered were used as basis for the design of the prototype. The project team has already created a concept design for the batch-type fluidized bed dryer, with the system design for evaluation and the draft Terms of Reference indicating the technical specifications of the system for finalization. Training on designing fluidized bed dryer applying thermodynamic properties is to be conducted at the Vietnam Institute of Agricultural Engineering and Postharvest Technology on the first quarter of 2014 to supplement the knowledge of the project team which will be a great contribution in coming up with the most appropriate system design. Fabrication of the prototype batch-type fluidized bed dryer will start by the second quarter of 2014 simultaneous to the start of designing the continuous-type fluidized bed dryer.

Design and Development of Superheated Steam Treatment System for Stabilized Brown Rice

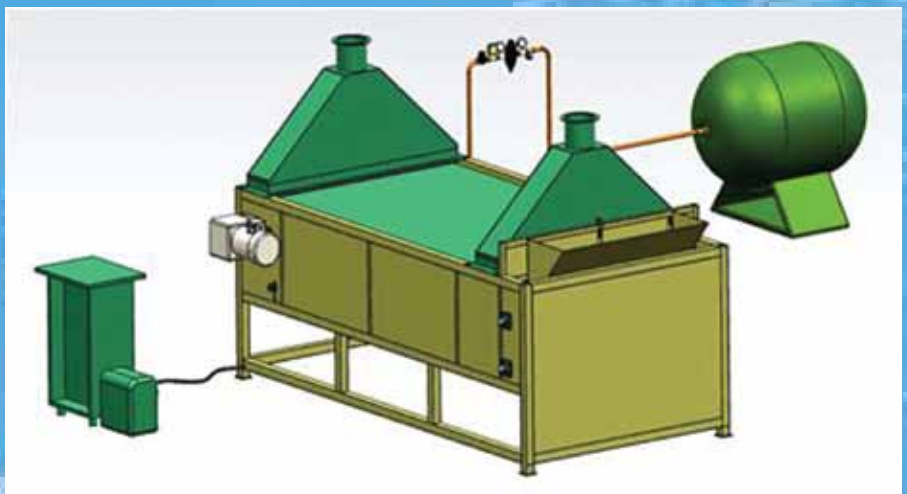
This project entitled "Design and Development of Superheated Steam Treatment System for Stabilized Brown Rice" is a joint project of the MIRDC and the FNRI which aims to design and develop a batch-type and continuous-type prototype systems that will extend the shelf life of brown rice from 1-2 months to 5-9 months.

Two systems will be designed and developed for two years: the batch-type that treats brown rice in a stationary manner in the first year (2013); and the continuous-type that treats brown rice continuously in the following year (2014).

The batch-type prototype system, which has a capacity of 10 to 15 kilograms per batch, will be operated on a superheated steam of 300o¬C and 3 bars temperature and pressure, respectively. It comprises of major components such as the Treatment Machine, Superheated Steam Generator, Pipe Assembly and Power Controls. The Treatment Machine is the component where complete treatment of brown rice takes place. It has an overall dimension of 2.7 meters long, 1.4 meters wide and 1.7 meters high. All parts such as feeding hoper, conveyor, treatment chamber and discharge chute will be made of a food grade stainless steel sheet, while frames will be made of mild steel. The Superheated Steam Generator is a boiler integrated with superheater to generate a superheated steam by re-heating the saturated steam up to 300oC. It is made from standard boiler materials and constructed based on American Society of Mechanical Engineers (ASME) and Philippine Society of Mechanical Engineers (PSME) standards to work safely and efficiently. The Pipe Assembly provides passage for the superheated steam from the Superheated Steam Generator to the Treatment Machine. It will be made of a food grade stainless steel pipe and a solenoid to control the flow of superheated steam. The Power Controls are collections of electrical and electronic components connected together to run the entire system to its definite function that is both safe and comfortable for the operator.

Brown rice has 10% higher milling recovery than white rice with a reputation for nutritional excellence and health claims. However, brown rice has some disadvantages such as slower absorption of liquid that leads to prolonged cooking time. The oil content in the bran becomes rancid, leading to a shortened shelf life. Short shelf life of brown rice is a significant drawback to its availability and affordability. The brown rice lipid-rich layer is susceptible to microbial and insect damage, the reason that despite its nutritional advantage and health benefits, it remains unappealing to consumers, government advocacies and major stakeholders. Thus, efforts to encourage consumption of brown rice could not take-off in the market.

This project was envisioned to support the national program of the government on Rice Sufficiency in 2016. It will also address the R & D Program for the Brown Rice of the DOST to identify factors affecting the stability and acceptability of brown rice after processing and storage. The fabrication of the prototypefor the batch-type Superheated Steam Treatment System is expected to be completed by mid-2014.



The completed design of the Superheated Steam Treatment System for Stabilized Brown Rice.

Setting-up of retrofitting machineries at PHILMEC, Nueva Ecija.

Retrofitting of a Compact Rice Mill for Brown Rice Production

The project on "Retrofitting of a Compact Rice Mill for Brown Rice Production" aims to enhance brown rice production by retrofitting the most common and dominant type of rice mill in the Philippines. Retrofitting will enable the compact rice mills to produce both brown rice and well-milled rice, thus allowing rice mill owners to engage in production of brown rice without sacrificing their capability in producing well-milled rice. Moreover, retrofitting saves considerable amount of money compared to buying a new rice mill for brown rice. The MIRDC, in cooperation with the Philippine Center for Postharvest Development & Mechanization (PhilMech), is setting up a retrofitted compact rice mill system at the PhilMech Science City of Muñoz, Nueva Ecija for the production of brown rice.

Site visits and documentation of several existing rice mills such as those in PhilRice-Nueva Ecija, Pulilan and Baliwag Bulacan were conducted to gather relevant information on the design, operation and economics of rice mills. Meetings with local rice mill fabricators such as Jerton Enterprises in Malabon City, Mechaphil in Pampanga and Mariñas Technologies, Inc. in Laguna were also conducted for the same purpose. Visit to and documentation of the multi-pass rice mill and retrofitted compact rice mill of Susi Foundation in Tiaong, Quezon also provided relevant data. The gathered information, along with data obtained from literature and other references, were used as basis of the concept design for retrofitting.

One unit of a single pass rice mill and one unit of a paddy separator with their corresponding accessories were procured and brought to PhilMech in Muñoz, Nueva Ecija for installation and retrofitting. Initial testing was performed to check if the performance of the procured units complies with the indicated specifications.

AMTEC Testing will be performed after the initial functional testing to verify if the performance of the rice mill and paddy separator comply with established standard performance of such machines. Retrofitting will follow once the performance of the individual units is assured to comply with the standard and a final layout is set. Another round of functional testing was done to evaluate the performance of the retrofitted unit. A second round of AMTEC Test is scheduled to be performed on the second quarter of 2014 to verify the full functionality and rated performance of the retrofitted rice mill.

Design and Development of Hand Tractor Attachments (Harvester and Transplanter

The MIRDC, in partnership with the PhilMech is implementing a project entitled "Design and Development of Hand Tractor Attachments (Harvester and Transplanter)." The concept of developing rice transplanting and harvesting implements that can be readily mounted to and dismounted from the hand tractor unit is relatively new. The availability of such implements will significantly increase the utilization of hand tractors in farm areas. Moreover, they can potentially reduce the cost of farm-level mechanization. The tar-

Actual model of the transplanter-attached-handtractor prototype.

Field testing of transplanter-attached-handtractor prototype in Amucao, Tarlac.

get beneficiaries of this project are the farmers, rice field owners and planters, agri-cooperatives and local fabricator shops.

Unlike commercially-available transplanters and harvesters which are self-propelled and dedicated machines, these mechanisms are integration of a transplanter or harvester to a hand tractor which can be readily disassembled in order for the hand tractor to be usable for other farm operations.

Functional testing of the transplanter-attached-handtractor prototype at the MIRDC.

The transplanter-attached-handtractor is driven by a 7Hp diesel engine, with a six-row planting capacity. Its planting distance is within 20cm to 25cm as required by the Philippine Agricultural Engineering Standards (PAES). Furthermore, it also has an adjustable planting depth comparable to commercially-available transplanters. The harvester-attached-handtractor is driven by a 9Hp diesel engine, with target working efficiency of 500m^2/hour.

The transplanter-attached-handtractor and harvester-attached-handtractor offer many operational and financial benefits. By using these mechanisms, appropriate, efficient and effective transplanting and harvesting functionalities will be added to plowing, tilling and harrowing, which a hand tractor can perform. Their use will also address the delay in the transplanting and harvesting period and high labor costs due to the lengthy jobs. The transplanter-attached-handtractor prototype was completed and several rounds of field testing will be conducted in the first half of 2014. The design, prototyping and testing of the harvester-attached-handtractor is also expected to be completed in 2014.

WORLD-CLASS FACILITIES, QUALITY SERVICES

Establishment of a Finite Element Analysis (FEA) Design Center

The automotive industry is a highly globalized business that involves high-end technological know-how requiring very high capital where competitive prices can be realized through economies of scale. Multinational car manufacturers like Toyota, Honda, Nissan, etc. divide the production of automotive components and parts through a global production network. Dr. Rafaelita M. Aldaba of the Philippine Institute for Development Studies (PIDS) also underscored the existence of intense competition in these auto parts manufacturing industry among countries, particularly in the ASEAN region.

Mr. Vicente Mills Jr., President of the Philippine Automotive Federation Inc., reported that for ASEAN car production in 2011, Thailand dominated accounting for 48% of the total volume followed by Indonesia, 28% and Malaysia, 18%. Vietnam produced 100,000 units (4%) while the Philippines exhibited the lowest production level in ASEAN at 65,000 units or 2%.

The CLRV industry makes up a significant portion of the Philippine

Scanned outputs of different types of Customized Local Road Vehicles (CLRVs).

Automotive Industry. The Philippine National Standards define CLRVs as "vehicles manufactured locally, assembled or rebuilt using remanufactured parts or a combination of both, driven upon highways for the purpose of transporting people and/or goods." The most common forms of CLRVs in the country are tricycles, jeepneys, mini–buses and Asian Utility Vehicles (AUVs). However, there are no existing standards that govern the structural composition of CLRVs and roadworthiness tests have not been performed. These vehicles are used nationwide and creating a baseline for its standardization is a must to ensure safety of both passengers and cargo. The use of FEA addresses the verification of their structure and ensures their roadworthiness.

FEA is a method employed in solving stress-strain relationship in structures and solid bodies. It is mostly used in the industry in the analysis and optimization phase to reduce the amount of prototype testing and to simulate designs that are not suitable for prototype testing. Computer simulation allows multiple "what-if" scenarios to be tested quickly and effectively.

This MIRDC project entitled "Establishment of a Finite Element Analysis (FEA) Design Center" aims to establish a FEA Design Center in support to the CLRV Industry. The FEA team focuses on structural design analysis of CLRVs, particularly the chassis and body of jeepney, tricycles, AUV and mini buses with the purpose of discerning safety and weight optimization. The team will conduct FEA on existing designs of CLRVs and subject them to several simulated crash scenarios (front impact, front offset impact, side impact, rollover / roof crush) to ascertain their safety.

In its first year, the project established a partnership with local CLRV manufacturers through a MOA signed between the MIRDC and Sarao Motors, Inc., DMENG RICH Enterprises, and Stow Away Liner. In addition, an Automotive Chassis Design and Optimization Training was conducted with Mr. Masahiro Munemura, a top rated car engineer and entrepreneur from Japan, as the resource speaker.

The facility includes FEA software and hardware, 3D Scanner and Printer. Geomagic Design X is the reverse engineering software to be used in the scanning of the different CLRVs while LS Dyna will be employed for crash test simulation. Training on LS Dyna, is set on the first quarter of 2014 so as to learn more about the software and to observe an actual crash test simulation. Of the four types of CLRVs that this project focuses on, only the tricycle has been scanned so far. The jeepney, mini bus and AUV are to be scanned in the first quarter of 2014. Results of the scanning will be utilized as basis for optimization and standardization of the CLRV structures.

Memorandum of Agreement (MOA) signing between the MIRDC and local CLRV manufacturers.

Mr.Munemura and company together with the participants of the Automotive Chassis Design Training.

Establishment of a Die and Mold Solution Center (DMSC)

The tool and die making industry is one of the metalworking sectors that has been identified for accelerated development since it enables faster growth of the manufacturing sector. It is for this reason that the DMSC is being established to enhance the local tool, die and mold making industry and accelerate economic development and consequently reduce dependence on importation and foreign technology.

The project is part of the DOST's ardent support in making the local manufacturing sector become more productive through a more competitive local die and mold industry through the provision of facilities, technology and manpower development. It specifically aims to focus on the acquisition of the needed technology and facilities to support the industry's competitiveness by means of the localization of currently imported dies and molds.

This intervention was initiated by DOST Secretary Mario G. Montejo and was formalized through the signing of a Memorandum of Understanding (MOU) between the DOST and the Philippine Die and Mold Association (PDMA) last 16 April 2012. The MOU specified in details the different aspects of the project and designated the MIRDC as the official research and development station.The MOU signing is a leap not only to give the 'Makinarya at Teknolohiya para sa Bayan' (MakiBayan) Program a strategic focus but will further strengthen the collaborative relationship of public and private sectors. Corollary to the signing of the MOU is the launching of the DMSC project in 2013 by the MIRDC in partnership with the PDMA.

Acquisition of new sets of additional design and simulation software on plastic mold injection, blow molds and stamping dies is still ongoing including the advanced equipment to complement and upgrade the present

The DMSC featured at the PDMEx 2013 held at the World Trade Center in Pasay City.
From left to right: DR. AGUSTIN M. FUDOLIG, MIRDC's Deputy Executive Director for Technical Services; MR. ANTONIO LUIS T. FUSTER, PDMA President; PROF. FORTUNATO T. DELA PEÑA, DOST Undersecretary for Scientific and Technological Services; and ENGR. FRED P. LIZA, OIC of the Prototyping Division of the MIRDC and the DMSC Project Leader.

CNC machines at the MIRDC.This will be in accordance to the priority as determined by the PDMA Technical Working Group (TWG) and will include CNC High Speed Machining Centers, 5-Axis Multi-Tasking Machines,CNC EDM sinker/drill/wirecut, LASER Welding Machine, Surface Grinders, among others. Renovation of the MIRDC Metalworking Shop I (MWS I) building is also a part of this initiative so as to accommodate the new set of equipment being acquired.

For the second year of implementation, new die and mold makers will be trained. Knowledge about best practices and techniques, as well as the technology of current professionals will be supplemented. This will be conducted in reference to basic die and mold making as well as advanced technologies relevant to die and mold making, particularly in high speed machining.

Furthermore, access to advanced dedicated technology and facilities on die and mold-making will be provided and allowed through the implementation of the DMSC project. The private sector can look forward to participating in a facilities-sharing scheme after service protocols and guidelines, as well as machine rates, have been finalized by the MIRDC and the PDMA-TWG.

The MIRDC is also gearing up to provide consultancy and training on specialized techniques and procedures relevant to tool, die and mold making. To realize this planned output, the DMSC personnel has been undergoing training which includes participating in benchmarking activities outside of the country. Review of existing curriculum on die and mold making is being conducted for pilot implementation starting July 2014.

The proposed new MWS Building.

The following is a summary of the intended interventions and specific activities to be undertaken:

INTERVENTION	SPECIFIC ACTIVITIES
Manpower Solutions	Training of CNC Machinists and Programmers Training of Die and Mold Designers and Makers
Design and Engineering Solutions	Computer-Aided Designing (CAD) Computer- Aided Machining (CAM) Plastic Injection Molding Simulation Stamping Die Simulation
Facility-Sharing Solution	CNC High Speed Machining CNC EDM Sinking CNC EDM Wire Cutting CNC Milling/Turning CNC Vertical Machining Surface Grinding Centerless Grinding Laser Welding Micro Deposition Die and Mold Assembly and Trial Shot Die and Mold Repair Plastic Injection Molding Turret Punching Plasma and Laser Cutting
Technical Solutions	Productivity and Quality Improvement Cost Reduction and Competitiveness Technology Upgrading Quality Management System

This collaboration between the DOST and the PDMA will result to the creation of various solutions that will bring about long-term benefits to the tool and die sector. The concerned agencies, especially the MIRDC being the Die and Mold Solution Center, are continuously working towards the materialization of the objectives and will continue with the work–in–progress until a more competitive and productive local tool and die sector is achieved

materials and process research division

Support Program for the Productivity and Competitiveness of the Metals and Engineering Industries

ADVANCED TRANSPORT SYSTEMS

Design and Development of an Automated Guide-way Transit (AGT) System Depot and Passenger Stations

Transport as a technology, typically follows a path of experimentation, introduction, adoption and diffusion. It is intelligent to continually develop the AGT System including the depot, passenger station, safety features, communication and fare system. A project demonstration will help determine the public's acceptance and assess how well the AGT System meets urban transportation needs. This transportation alternative will not only lessen the negative impacts of poor air quality and high noise levels to the environment, but will also provide efficient and sustainable transport service for passengers. Improving the transport service level is a catalyst for development and the standard assumption is that the AGT System investment inclines to be more wealth-producing.

The continuous development of the AGT System depot and passenger station will also address the worsening air-pollution in the metropolis. According to the Department of Health, breathing has become risky in Metro Manila, with automobiles and heavy traffic contributing 80% of air pollution. Clearly, transport vehicles are the culprits that cause air pollution in urban areas. Aside from the environmental threats, constant exposure of the public to air pollution creates unhealthy effects. Thus, it is extremely important to develop a clean and climate-friendly transport technology.

Development of a 120-Passenger per Coach Capacity Automated Guide-way Transit System

The Philippines is considered one of the Tiger Cub economies in Southeast Asia. The economy in the Philippines is the 43rd largest in the world according to the 2011 World Bank statistics and it is also one of the emerging markets in the world. Time dominates transport systems in advanced societies. It is very important to develop the transportation by promoting lesser travel time with an environment-friendly transport technology. The rapid growth of population fleeing to urban cities means increase in the number of commuters hence the need for additional modes of transport and the improvement of existing ones.

The project aims to address the severe lack of environmentally-sustainable transport alternatives by demonstrating the use of a localized AGT System that will rise along Gen. Santos Avenue in Bicutan, Taguig City.

Moreover, the project will develop an advanced transport system alternative using Filipino ingenuity and capability in engineering. Furthermore, this will serve as a model for adoption in other urban areas in the Philippines.

Study of Three (3) Potential Automated Guide-Way Transit System Routes

The Department of Science and Technology (DOST) through the MIRDC conducted a Research and Development project to develop and study a prototype AGT System aimed to offer an alternative and efficient transport technology to address the country's pressing problems such as traffic congestion and safety degradation, noise and air pollution, and inefficient public transport. Currently, there are two versions of AGT systems, namely; AGT in UP Diliman with a capacity of 30 passengers per coach (light version) and AGT in Bicutan with a projected capacity of 120 passengers per coach (regular version). The AGT-UP was demonstrated to President Benigno Aquino III, several high ranking government officials and a number of possible technology adopters. Test and evaluation of each component and system is on-going. The AGT-Bicutan is already on its second phase. This version will also be assessed and evaluated for technical viability as it has different specifications and parameters from the AGT-UP. The Light Version is envisioned to act as feeder/secondary transport system to existing and future primary train systems of the country such as the LRT, MRT, and PNR. The Regular Version meanwhile can be adopted and utilized on primary thoroughfares as it can serve more passengers.

Spreading this technology to urban communities can help address the above- mentioned problems. After a series of technology demonstrations, several stakeholders (e.g. Local Government Units and private sector) have inquired and hinted interest in adopting the AGT technology. The project team has been consistent in successfully proving that the concept of synchronization of motors will equally distribute the load to each bogie. The testing and evaluation of components are on-going. With all the important things falling into place, it is timely to bring the development to the next level. To realize the full potential of the AGT system, longer test tracks equipped with temporary stations, maintenance depot, communication system, fare collection system, safety features, etc. are needed to simulate actual operations. Three potential routes were identified:

1. Expansion of AGT UP to Philcoa and to C.P. Garcia Avenue;
2. Extension of AGT Bicutan from NRCP to C-6 (Lower Bicutan Barangay Hall); and
3. Commonwealth to Montalban via IBP Road (Litex)
4. Other potential areas wherein the AGT System can be implemented

For easier implementation of activities relative to the said projects and to further evaluate the impact to other sectors and stakeholders, it is proposed first to conduct preparatory/ preliminary activities to include site survey, subsurface soil investigation, and architectural and engineering design of tracks, stations and depot prior to actual development. This will give the stakeholders a better understanding on the planning, construction and maintenance of AGT infrastructure.

SURFACE ENGINEERING

Development of Vacuum Gas Quench Heat Treatment Furnace

Heat Treatment plays a vital role on the properties of metals. The process improves the properties of the final products suitable for their application. The environment where heat treatment will be conducted should be controlled to prevent scaling, decarburization, and oxidation. Distortion should be minimized and the overall process should be also be environment-friendly. To offer these significant effects on heat-treated materials, Vacuum Heat Treatment will be utilized.

Most of the vacuum treatment facilities in the country today are in-house. They only cater to their own products. On the other hand, there are few commercial vacuum gas quench facilities which charge high costs for their services. To provide the industry with the needed technological edge with regard to heat treatment services for various ferrous metals, the MIRDC developed a Vacuum Gas Quench Heat Treatment Facility. The fabricated vacuum heat treatment system consists of the following:

1. Chamber or Vessel System - The chamber consists of heat zone. The heat zone is the place where the load is heated at time-temperature under vacuum state environment.
2. Quench System – this system ensures the controlled cooling of metals to arrive at the desired property.
3. Control Panel System - serves as the human interface for the operation of the furnace. The panel system is a computer-based application that allows the user to facilitate the process.
4. Vacuum Pump System - provides specific evacuation levels and pump-down times.

The MIRDC Vacuum Heat treatment service will be offered with a competitive price which is based on neighboring Asian countries to make this technology economically accessible.

Support to the Surface Engineering Requirements of High Technology Manufacturing Industries

In response to the demands for improvement in technology to make the local industries, specifically the metals and engineering industries, competitive, the Department of Science and Technology (DOST) through the Metals Industry Research and Development Center (MIRDC) established an anodizing facility.

Anodizing is a process of producing the film of aluminum oxide which forms an aluminum when direct current at sufficient voltage is passed through a suitable acid electrolyte wherein aluminum is the anode and a suitable material the cathode. Anodizing can be broken down into two broad sub-categories: decorative anodizing and hard anodizing. Hard anodizing, also known as hardcoating or Type III anodizing, is a process used to create a hard wearing, corrosion-resistant coating on a variety of metals. The main differences between the two are the thickness and durability of the coating and the exact process used to create it.

Anodizing-related equipment and facilities were installed at the MIRDC's surface engineering building last CY 2013. These include: approx. 350-L capacity tanks, DC rectifier, pulse rectifier, chiller, cooling tower, de-ionizing water facility, fumes scrubber and waste treatment facility.

A complete anodizing line consists of the following process: cleaning, etching, desmutting, anodizing, dyeing, sealing and drying process.

The MIRDC's anodizing facility will help address the needs of different sectors such as automotive, industrial, aerospace, shipping, among others. It is also envisioned that the availability of this facility will develop the capability of local companies involved in the surface finishing business and enable them to be at par with international standards in quality and productivity that will significantly redound to a better domestic economy.

Value Adding Iron Resources

Iron resources exploited from the Philippines are all imported to other countries. According to the Mines and Geosciences Bureau (MGB), there was a total of 216,176 DMT of iron ore concentrates directly shipped abroad in 2012. Most of the known Philippine iron ore deposits, terrestrial or offshore, are magnetite deposits, which require concentration by magnetic separation before becoming suitable for direct reduction process. The Philippines has around 55 million tons of known lump magnetite deposits at an average grade of 30%Fe. Beneficiation to increase this grade to at least 65%Fe will yield around 25 million tons of fine magnetite concentrate.

The ironmaking technologies with the potential of making use of indigenous iron ore and locally available reductants and fuels are discussed. Experiments on reducibility is conducted to some indigenous Philippine iron ore samples to support the recommendations as to which ironmaking technology has the most potential in Philippine setting. The results showed that the ores have good level of reducibility using natural gases but is still mostly dependent on the amount of iron in

the ore. Thus, beneficiation is still recommended before subjecting to any ironmaking technology. This is also in view of the potential high amount of natural gas deposits in the country, it is recommended for their use as reductant for high capacity DRI production which proposes the technologies to Midrex, HyL and RH Process.


Anodizing line - tanks, rectifiers, chiller


De-ionizing water facility


Fumes scrubber, cooling tower and waste treatment facility

TECHNOLOGY TRANSFER

technology diffusion division

industrial training section

The Industrial Training Section (ITS) upholds its commitment in assisting both the private and public sectors of the metal industries for their training requirements to develop and enhance personnel competency in various fields of specialization. Training is an important intervention for the improvement and development of individual employees contributing to the organization's global competitiveness. For the year 2013, with the collective efforts of all the Center's divisions and sections, the ITS was able to implement one hundred twenty-nine (129) technical, engineering and management training programs categorized as regular, packaged and regional.

The summary of training programs conducted, including the number of persons trained, is shown below.

Table 1. Summary of Regular Training Programs Conducted in 2013.

Title of Training Programs	Frequency of Programs Conducted	No. of Trained Persons
Industrial Calibration	4	124
DM I: Basic Measurement	4	80
DM2: Basic Length Calibration	4	45
Uncertainty of Measurement: Length Calibration Application	2	24
Metals Identification & Selection	2	22
Establishment of Preventive Maintenance System	2	12
Heat Treatment of Steels	2	11
Nondestructive Testing	2	11
Verification of Common Laboratory Instruments	1	25
Cost Estimation for Machining Jobs	1	13
DM3: Limits & Fits & Inspection of Geometrical Tolerances	1	11
Electroplating Process	1	10
Production Planning and Control	1	10
Basic Plastic Injection Mold Design	1	6
Project Management	1	5
Shielded Metal Arc Welding	1	5
TIG Welding on Carbon Steel Plates	1	5
Plastic Injection Molding Machine Programming & Operation	1	4
Fundamentals of Corrosion	1	4
CNC Milling Programming & Operation	1	3
Basic Coordinate Measuring Machine (CMM)	1	2
Total	**35**	**432**



(Left) "CNC WEDM Programming and Operation" seminar/workshop for **Southern Luzon State University** with Mr. Ramon Martin as resource speaker; (middle) the **Procter and Gamble Philippines, Inc.** participants with Engr. Wilbert H. Balingit (right) and Mr. Randy Jimenez during the hands-on activity for the Calibration of Pressure Gauges Seminar on May 30-31, 2013.

Table 2. Summary of Packaged Training Programs Conducted in 2013

Title of Training Programs	Frequency of Programs Conducted	No. of Trained Persons
SMAW on Carbon Steel Plates	5	63
Productivity Improvement through 5S Practice	3	111
Internal Quality Audit	3	58
Industrial Calibration	3	50
CNC Wire-Cutting EDM Programming & Operation	3	34
ISO 9001: 2008 Awareness	2	73
Documenting a QMS Conforming to ISO 9001:2008 Std.	2	49
Machine Shop Operations & Gen. Welding Processes	2	38
GMAW Carbon Steel Pipes	2	23
Info. Seminar on Brazing Process (Torch Brazing)	1	27
Fundamentals of Corrosion	1	26
Improving the Workplace thru 5S	1	22
Root Cause Analysis	1	22
Metals ID & Selection	1	15
Calibration of Pressure Gauges	1	15
TIG Welding on Carbon Steel Plates	1	14
Basic Occupational Safety & Health	1	13
DM1: Basic Measurement	1	13
TIG Welding on B.I. Pipes	1	12
ISO/IEC 17025 Awareness	1	11
SMAW on Carbon Steel Pipes	1	11
TIG Welding	1	10
The Basics of Die Design & Fabrication & Fundamentals of Press Working	1	9
Production Planning & Control	1	7
CNC Machine Maintenance and Troubleshooting	1	5
Total	**41**	**731**

The companies which requested for specially-designed training programs solely for their needs are the Agricultural Machinery Testing and Evaluation Center (AMTEC), Bounty Fresh Foods Inc., Canon Business Machine (Phils.), Inc., Concepcion Durables, Inc., Lopez Sugar Corporation, Monde Nissin Corporation, National Research Council of the Philippines (NRCP), Naval Sea Systems Training Center, Philippine Institute of Volcanology and Seismology (PHIVOLCS), Philippine Science High School (PSHS), Philippine Nuclear Research Institute (PNRI), Procter and Gamble Philippines, Inc., R.U. Foundry and Machine Shop Corp., Southern Luzon State University (SLSU) and United Pulp & Paper Co., Inc..

Procter and Gamble Philippines, Inc. participants during their hands-on training for Shielded Metal Arc Welding (SMAW) Seminar last December 2 - 6, 2013 conducted by Engr. Reynaldo L. dela Cruz Jr. and Ms. Desiree Reyes.

Canon Business Machine (Phils.), Inc. participants during the seminar on The Basics of Die Design and Fabrication, and the Fundamentals of Press Working (October 21 – 25, 2013) with one of the resource speakers, Engr. Romanico Salido.

National Research Council of the Philippines (NRCP) participants with resource speaker Dr. Danilo N. Pilar during the seminar workshop on Root Cause Analysis (April 23 – 24, 2013),

Table 3. Summary of Regional Training Programs Conducted in 2013

Title of Training Programs	Frequency of Programs Conducted	No. of Trained Persons
Aluminum Welding Using GTAW	1	13
CNC Machine Tool Programming & Operations	13	260
Cost Estimation for Machining Jobs	1	27
DM1: Basic Measurement	2	31
DM2: Length Calibration	2	30
DM3: ISO Limits & Fits	1	12
Electroplating Processes	1	8
Energy Audit	1	84
Equipment Design & Development	1	13
Establishment of PM System	1	24
GMAW & GTAW Processes	2	24
Heat Treatment of Steels	3	52
Industrial Calibration	1	26
Info. Seminar on Material Selection & Heat Treatment of Steels	1	10
Info. Seminar on Productivity Improvement on 5S Practice	1	29
Info. Seminar on Metal Identification & Selection	1	20
Info. Seminar on General Welding Processes	3	58
Info. Seminar on Occupational Safety & Health (Welding & Machine Shop)	1	52
ISO/IEC 17025 Awareness	1	7
Machine Shop Operation	1	6
Machine Shop Operations (Turning & Grinding)	1	8
Metal Acid Etching Technology	1	18
Non Cyanide Electroplating Process	1	7
Occupational Safety & Health	1	15
SMAW on Carbon Steel Plates	2	35
Smithery	1	20
Spinning	1	9
Stainless Steel & Aluminum Welding Using GTAW	1	13
Turning I	1	16
Uncertainty of Measurement	2	35
Welding Defects and Remedies	1	57
Wrought Iron Furniture Fabrication	1	12
Total	53	1051

PROJECTS IMPLEMENTATION

Capability Upgrading of the MSMEs in the Metals & Allied Engineering Sector through Technical and Management Trainings (Phase II)

The Grant-In-Aid (GIA) project entitled, "Capability Upgrading of the MSMEs in the Metals & Allied Engineering Sector through Technical and Management Trainings – Phase II," was successfully implemented by the DOST (NCR), the MIRDC and the Philippine Die and Mold Association (PDMA) with Engr. Reynaldo L. Dela Cruz Jr. as Project Leader.

Under this project, the four (4) seminars – DM1: Basic Measurement; Production Planning & Control; Basic Occupational Safety & Health; and TIG Welding, were conducted and attended by a total of 50 participants from various member-companies of the PDMA.


Production Planning & Control seminar on February 4 – 5, 2013.


DM1: Basic Measurement participants during hands-on portion with the presence of Mr. Eduardo V. Diasanta Jr. on May 8 – 10, 2013.


TIG Welding seminar with Engr. Isidro D. Millo as resource speaker on May 20 – 24, 2013.



Basic Occupational Safety and Health attended by 17 participants with Resource Speakers Engr. Reynaldo L. Dela Cruz, Jr. (left), Engr. Florante A. Catalan (Center) and Engr. Wilbert H. Balingit (right) held on January 14 – 15, 2013.

Enrichment of the Competencies of MSMEs Welding Sector in the National Capital Region through Specialized Training and Certification

The DOST – NCR, the MIRDC, and the Philippine Welding Society (PWS) have identified the training needs of human resources in the M&E sector's Micro, Small and Medium Enterprises (MSMEs) and have joined resources to implement the project entitled, "Enrichment of the Competencies of MSMEs Welding Sector in the National Capital Region through Specialized Training and Certification." This is a one-year project which started on January 2, 2013 and will be completed on January 3, 2014 under the supervision of Engr. Reynaldo L. Dela Cruz Jr. as the Project Leader. Its objective is to sustain the demand for skilled, competent and qualified workforce in the MSMEs for the metals and allied engineering sectors.

Based on initial assessment and client interaction, the MIRDC developed eight (8) technical training programs that were needed by the industry. These are the SMAW – Carbon Steel Plates and Pipes, GMAW – Carbon Steel Plates and Pipes, FCAW – Carbon Steel Plates and Pipes, GTAW – Carbon Steel Pipes and Oxy-Acetylene Cutting/Welding (OAC/OAW).

Among the eight (8) developed training programs, six (6) were participated in by a total of 113 participants. All trainees took the corresponding assessments facilitated by the PWS except for GTAW-Carbon Steel Plates training wherein assessment was not required. Out of ninety-nine (99) trainees assessed, sixty-one (61) passed the assessment.






Several batches of training programs on SMAW, GMAW and GTAW application for carbon steel plates and pipe were conducted under the joint project of DOST – NCR, MIRDC and PWS.




1st & 2nd batch of SMAW for Plates seminar/workshop conducted in Brgy. Tanza, Navotas City by Engr. Reynaldo L. dela Cruz, Jr. and Engr. Jojit Velasco.

Technoville Skills Upgrading Program: Upgrading the Skills of Selected Residents of Brgy. Tanza, Navotas City

The project entitled "Technoville Skills Upgrading Program: Upgrading the Welding Skills of Selected Residents of Brgy. Tanza, Navotas City" was organized and conducted under the joint efforts of the DOST – NCR, the MIRDC and the Local Government Unit (LGU) of Barangay Tanza, Navotas City. Its main objective is to improve the technical trade skills of selected residents of Brgy. Tanza in Navotas City and improve their opportunities for employment.

The first and second batches for Shielded Metal Arc Welding (SMAW) for Plates were conducted and each batch took the evaluation and assessment to determine eligibility for the PWS Certification. Participants who passed the assessment will advance to the SMAW-Pipes training.

Capability Building for Competitiveness of the Metals and Engineering Industry Cluster (CAIMTEC – Cordillera Aerospace and Industrial Manufacturing Technologies Corporation) of CAR for the Localization of Industrial and High-Precision Technology Parts

During the second year of implementation of the project of the DOST – CAR, the MIRDC and the Aerospace Industry Association of the Philippines (AIAP), four (4) training programs were conducted – DM1: Basic Measurement, DM2: Basic Length Calibration, DM3: Limit and Fits and Inspection of Geometrical Tolerances and Uncertainty of Measurement. These are in support to the project's objective to raise the capability level of machine shops and other M&E firms to produce agro-industrial and high-precision technology parts requirements conforming to international standards.

Conduct of DM 1: Basic Measurement, DM2: Basic Length Calibration, DM3: Limit and Fits and Inspection of Geometrical Tolerances and Uncertainty of Measurement seminars/workshops under the CAIMTEC project of the DOST–CAR, the MIRDC and the AIAP.

CNC Machine Tool Programming and Operations Training Program

The DOST-Grant-in-Aid (GIA) project entitled, "Human Resource Intervention for Sustainable Growth & Competitiveness of the Metals & Engineering Sector Development & Implementation of Appropriate Training Curriculum Design for CNC Machine Tool Programming and Operations," is a two-year project with a target of 800 trained persons. The project objective is to address the "brain drain" of CNC machinists that has negatively impacted on the M&E industries.

Since the start of the project in 2012, there are ten (10) batches that were conducted in 2013. Six (6) batches graduated in the MIRDC, two (2) batches in CAR, one (1) batch in Talisay-Bacolod and one (1) batch in Batangas.

The first batch of graduates from the MIRDC started their training on December 6, 2012. After the 52-day rigid training on CNC Machine Tool Programming and Operations, they graduated on March 18, 2013. Likewise, the first batch in Batangas graduated on December 2, 2013. They were all employed at Metalcast Corporation in Carmona, Cavite, where they also had their immersion training.

For 2013, there are five (5) batches of CNC Trainees complying with the lined-up programs of the project.

The CNC Graduates

MIRDC CNC Trainees (from left to right): Batch 1 – March 18, 2013; Batch 2 – June 3, 2013; Batch 3 – July 29, 2013; and Batch 4 – September 20, 2013.



(Left) CNC Trainee-Graduates of Batangas, December 2, 2013; (Middle) from CAR, September 17, 2013; and (Right) from Talisay, Bacolod, December 9, 2013.

2013 M & E Celebration ITS Showcase

In the celebration of the 2013 M & E Week, free information seminars were provided to college students within the Bicutan community to serve our corporate social responsibility.

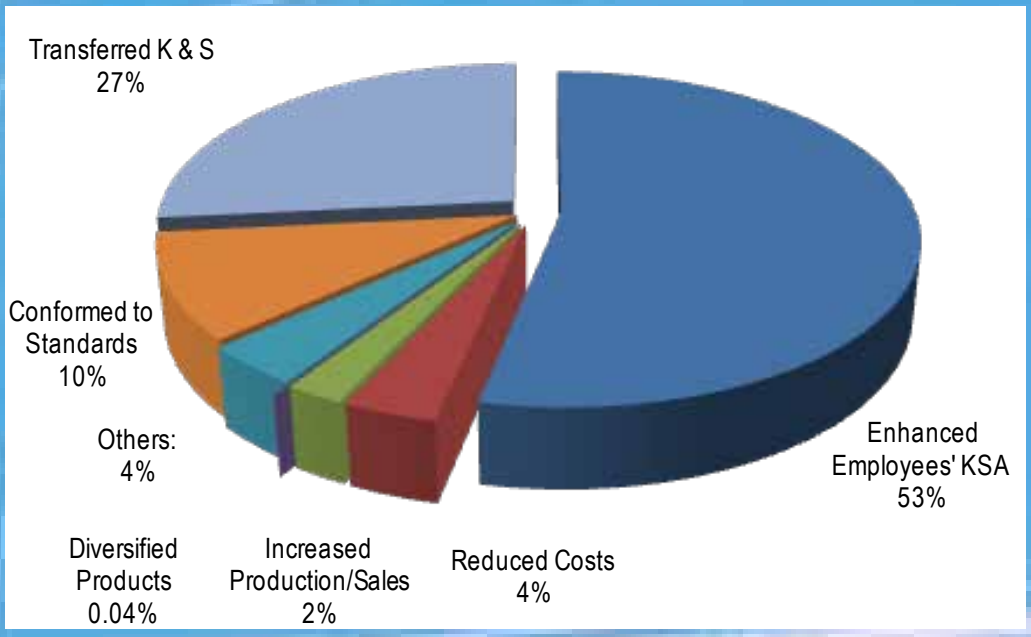

Information seminars on General Welding Processes with Engr. Jojit M. Velasco (left) and Mr. Raymond S. De Ocampo (right) as resource speakers during the M & E Week Celebration on June 19, 2013.

OJT TRAINING PROGRAM

For CY 2013, a total of one hunded fifteen (115) students taking up engineering, technology, management, computer and other courses from twenty three universities/colleges nationwide have availed of the On-the-Job Training (OJT) program of the MIRDC to enhance their knowledge and skills and complete their curriculum requirements.

IMPACT ASSESSMENT

To continuously improve the quality of the design and delivery of various training programs to upgrade the competencies of industries' personnel, survey through the Impact Assessment Questionnaires sent to the companies six (6) months after the conduct of training programs was conducted. Below is the result of the survey from 575 participating firms.



technology information and promotion section

The Technology Information and Promotion Section (TIPS) is an active part of the MIRDC's successes in 2013. In the pursuit of the Center's vision, the TIPS undertakes various activities that are relevant and significant to the M&E industries.

As the Center's R&D team continuously devotes time to complete the implementation of various projects including those under the High Impact Technology Solutions (HITS) Program of the Department of Science and Technology (DOST), the TIPS provides the necessary support in order to promote and disseminate information to the end-users of these technologies – the general public.

Beginning in the early months of this year, the MIRDC, in cooperation with the DOST-Project Management and Engineering Design Services Office (PMEDSO) and the University of the Philippines Diliman (UPD), was abuzz with preparations for the Demo Run of the Automated Guideway Transit (AGT) System. The Demo Run aimed to present to the Filipinos the locally designed and developed mass transit alternative that is envisioned to provide an answer to the transportation sector's need for a green technology. The event was held on 15 April 2013 at the project site in UPD with His Excellency President Benigno S. Aquino as the most awaited for passenger of the AGT.

Pres. Aquino and Sec. Montejo alight from the AGT after its Demo Run at the AGT-UP project site on 15 April 2013.

Sec. Montejo shares AGT stories to the media.

Joining the President in the AGT ride were Secretary Mario G. Montejo and other key officials of the DOST, UPD Chancellor Ceasar P. Saloma, Commission on Higher Education Chairperson Dr. Patricia B. Licuanan, Bases Conversion and Development Authority President and CEO Mr. Arnel Paciano D. Cassanova Esq., among others.

Guests included industry association presidents, company owners, representatives from the academe, personalities from the public sector, and friends from the media. It was a great opportunity to show to the Filipino people the product of Filipino engineers and technicians. The Demo Run gave the public a view of what science, technology, and innovation means. It was an event where the TIPS was able to promote the Center's R&D activities and at the same time, to clearly define the relevance of R&D in the lives of every Filipino.

Following the success of the Demo Run were the Public Demonstration of the AGT-UP and the soft launch of the Road Train, both held on 18 December 2013 at the UPD. The Public Demo was aimed to simulate the use of the AGT's ticketing system and newly-constructed passenger stations. Sec. Montejo and UPD Chancellor Ceasar A. Saloma,

UPD Chancellor Ceasar Saloma and DOST Sec. Mario G. Montejo led the ribbon-cutting ceremonies of the AGT-UP Public Demo.

The Road Train safely brings its VIP passengers to the UPD Quezon Hall during its soft launch on 18 December 2013.

joined by other VIP passengers, rode on the AGT from Lakandula Street to the University Avenue, where they were picked up by the Road Train which took them to the Quezon Hall inside the University. UP President Alfredo E. Pascual received the VIPs at the end of the Road Train ride. It was another event held smoothly through the assistance and over-all coordination of the TIPS.

The Metals and Engineering (M&E) Week and the MIRDC's Anniversary are two celebrations that made the month of June special. Attuned to Presidential Proclamation No. 144, the M&E Week was held in the third week of June. As part of the said occasion, the TIPS coordinated various events lined-up on 19 June 2013 which include: an Open House; a Focus Group Discussion (FGD); and a Techno Demo/Info Seminar.

Officers and members of metal-working associations, officials and personnel of the DOST and its attached agencies, and officials of several invited barangays participated in the Open House. Engr. Jonathan Q. Puerto, MIRDC's Deputy Executive Director for R&D, discussed on-going projects under the HITS Program. Engr. Fred P. Liza, OIC of the MIRDC's Prototyping Division, facilitated the plant tour wherein the Center's R&D projects, like the CNC Plasma Cutter and the CNC Router, design centers and other facilities were shown.

Simultaneous to the Open House were the FGD on the Micro Cupola Furnace and the Techno Demo/Info Seminar featuring technologies like Welding, Wrought Iron Equipment, Non-cyanide Electroplating, and Spin Casting. The FGD was designed for those who are in foundry operations. Colleagues from the DOST, members of the academe, MIAP and PMAI members, as well as equipment fabricators and suppliers attended the FGD. The FGD was composed of a lecture, demonstration of the Micro Cupola Furnace and an open forum. MIRDC engineers and industry experts served as panel during the discussion.

Engr. Jonathan Q. Puerto, MIRDC's Deputy Executive Director for R&D introduces the Road Train to the visitors during the Open House held during the M&E Week.

The Micro Cupola Furnace was put into action during the FGD.

The Techno Demo/Info Seminar catered to students and entrepreneurs alike. It served to let the public know of the various technologies developed and promoted for technology transfer by the Center, The aim is to encourage them to put up a technology-related business and take advantage of the assistance and other services offered by the MIRDC.

The TIPS played a key role in the smooth conduct of the mentioned events. It is the TIPS' function to promote the Center's technologies and to make sure that the industry receives all the quality services that it deserves. Proper information dissemination is a tool that helps the Center widen its reach and deepen its relationship with the industry.

The Center actively participated in the National Science and Technology Week (NSTW) at the SMX in SM Mall of Asia in Pasay on 22-27 July 2013 with the theme, "Science, Technology, and Innovation: The Road to a Smarter Philippines." The MIRDC proudly featured several of its technologies: the Automated Guideway Transit (AGT) System, the Centrally-powered Hybrid Electric Road Train, and the Electric Multiple Unit Retrofitting for PNR Railway System. These projects are under the Advanced Transport System, one of the technologies included in the NSTW's storyline – a major attraction of the exhibit.

Another feature of the 2013 NSTW was the "Upgraded Booths" category. Through the coordination of the TIPS, the MIRDC was able to showcase the 3D Printing and Scanning for the Advanced Manufacturing Technology. This is classified under the Cutting Edge Technology.

In addition, the Micro Cupola Furnace, the Freeze Dryer, and the Spin Casting Technology were housed in a separate booth during the exhibition. Occupying another prominent location at the NSTW were the Center's CNC machines – the CNC Plasma Cutter and the CNC Router.

The newest additions to the MIRDC's R&D output were all displayed for the viewers, young and old alike. The TIPS, together with engineers from the Prototyping Division and Materials and Process Research Division, and also from PMEDSO, shared information to guests who represented the academe, the industry, the government, and media. It was an experience that brought the MIRDC closer to a wide range of sectors. The success of the NSTW was worth all the effort because through this undertaking, important stakeholders are now aware of the outcomes and numerous possibilities of the Center's R&D.

MIRDC technologies featured at the 2013 NSTW held in SMX, SM Mall of Asia in Pasay City.

The Die and Mold Solution Center (DMSC) booth is the centerpiece in the 2013 PDMEx. In the photo are (L to R): Dr. Agustin M. Fudolig, MIRDC's Deputy Executive Director for Technical Services; Mr. Luis Antonio T. Fuster, PDMA President; DOST Undersecretary Fortunato T. Dela Peña; and Engr. Fred P. Liza, OIC of the Prototyping Division of the MIRDC cum DMSC Project Leader.

Technology promotion led the TIPS to the PDMEx 2013 held on 28-31 August 2013 at the World Trade Center. It is a biennial exhibition organized by the Philippine Die and Mold Association (PDMA) which is among the active partners of the MIRDC. Placed under the spotlight during the four-day exhibition was the collaborative project of the MIRDC and the PDMA which is the "Die and Mold Solution Center," led by Engr. Fred P. Liza. The PDMEx likewise featured a technical seminar on "Trends and Practices on Manpower Development in the Tool and Die Industry," where speakers from Japan, Singapore, Thailand, and the Philippines shared to the guests their country's experiences and learnings for the tool and die industry's development. Overseeing the conduct of the said activity was Dr. Agustin M. Fudolig, who is a Trustee of the PDMA.

Aggressively promoting the MIRDC's technologies, the TIPS coordinated and took charge of overseeing the participation of the Center in the Regional Cluster S&T Fairs 2013. MIRDC's technologies were on display in the exhibitions held in various regions of the country:

- At the Sky Ranch Activity Tent, Tagaytay Ranch in Tagaytay City on 12-14 September 2013 for the Southern Luzon Cluster Fair;
- At the Benguet State University in La Trinidad, Benguet on 30 September to 04 October 2013 for the Northern Luzon Cluster;
- At SM Iloilo in Iloilo City, Iloilo on 16-18 October 2013 for the Visayas Cluster; and
- At Almont Inland Resort and Convention Center in Butuan City on 06-10 November 2013 for the Mindanao Cluster.

TIPS is proud of its accomplishments for the year 2013. Its published materials include the Annual Report, three (3) newsletters, and fifty-nine brochures. It was able to complete the publication of the Spin Casting Technology Package and the Philippine Metals Products Directory. It facilitated and coordinated all activities for the production of two technology videos: the AGT-UP Demo Video Production and the Spin Casting Technology Package. The MIRDC actively utilized the tri-media and hence, was in newspapers, on the radio, and on TV.

Adding more to TIPS' list of accomplishments are: 33 press releases made; eight (8) exhibitions participated in; and three (3) industry dialogues conducted. Moreover, the industry profiling initiative of the TIPS has led to the generation, compilation, and analysis of statistics involving the seven sectors of the metalworking industry. Information will further be used by key people in the industry and policy-makers in the government so as to lay down better regulations and industry-friendly roadmaps to realize short-term and long-term goals.

The Center's library served a total of 816 researchers, while various facilities in the MIRDC accommodated 75 plant tours. Updates regarding activities, products and services of the Center are regularly uploaded in the website.

technology advisory and business development section

The MIRDC transfers technologies through various modes such as: (a) trainings which utilize various approaches like classroom seminars, hands-on/workshops, on-the job trainings; (b) technology demonstrations and fora; (c) technical assistance and consultancies; (d) fairs/exhibits; and (e) press releases

TECHNICAL ASSISTANCE AND CONSULTANCY

A total of **four hundred twenty one (421) firms and individuals** benefited from the technical consultancy services provided by the Center's consultants, mainly through its Technology Advisory and Business Development Section (TABDS).

Various consultancy services to individuals and firms nationwide that were provided addressed their concerns on heat treatment, welding, fabrication, metalcasting, metalworking processes, testing and analysis, calibration, coco-coir technology, muscovado processing/equipment, electroplating, establishment and implementation of a Quality Management System based on international standards and productivity improvement, among others.

The technical consultancy services provided resulted to the improvement of the proponents' product quality, production efficiency and volume of production, minimization of wastes, and upgrading of skills and competencies of their manpower.

Small Enterprise Technical Upgrading Program

The TABDS has been supporting the Small Enterprise Technology Upgrading Program (SETUP) of the DOST through the provision of technical consultancy, training, and evaluation of project proposals of various proponents and beneficiaries of the program. SETUP is a nationwide strategy of the DOST to encourage and assist small and medium enterprises to adopt technology innovations in order to improve their operations and boost their productivity and competitiveness. It enables firms to address their technical problems through technology transfer and technology interventions to improve productivity primarily through enhanced product quality, upgraded manpower, cost reduction, effective waste management and operations tune-up. Through the assistance of TABDS staff in giving recommendations on the type, capacity and application of machines and equipment, a number of proposals were approved.

Energy System Optimization for MSMEs in Region III

The DOST – Regional Office No. 3 and the MIRDC implemented the "Energy Systems Optimization for MSMEs" in San Fernando, Pampanga on October 2 - 11, 2013. The project guided the various SETUP MSME beneficiaries in the identification of potential energy efficiency and energy conservation opportunities. Engr. Wilbert H. Balingit and Mr. Osric Primo Bern A. Quibot

Figure 1 – Consultancy service on fabrication of stainless steel products by Engrs. Edilbert dela Peña and Wilfredo Lim in Region IX – Dipolog City, Zamboanga del Norte.

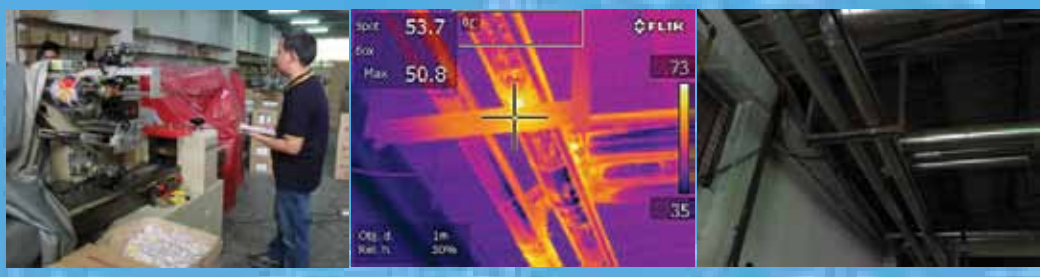


Figure 2 – Consultancy service on Energy Systems Optimization in Region III - Pampanga.

conducted a walk-thru assessment of the premises, checked various documents related to energy consumption and/or utilization of the company, conducted energy audit and data analysis, and presented their findings and recommendations.

The twelve (12) companies which benefited from this project are: (1) Angel Famous, Inc.; (2) Mekeni Food Corporation; (3) Betis' Best Meat Products; (4) Simbulan Industries; (5) Marky's Primebake; (6) Tivas Homemade Products; (7) Island Souvenir; (8) La Paz Prime Foods Corp.; (9) Nueva Cabanatuan Meat Products; (10) Ertess Plastics; (11) Puno's Ice Cream; and (12) Navarro's.

RU Foundry and Machine Shop Corporation's Journey to ISO 9001:2008 Certification

RU Foundry and Machine Shop Corporation (RUFMSC) located in Bacolod, Negros Occidental (Region VI) chose the MIRDC as its partner in the documentation and implementation of their Quality Management System (QMS) according to ISO 9001:2008 standards. Seminars/workshops on ISO 9001:2008 Awareness, Documenting the QMS, Organization of the Workplace through 5S and Internal Audit were conducted and attended by all of the company's staff in preparation for the Certification Audit in 2014.

Visible results of the assistance provided are the organized workplace and warehouse and repair of the roofings to prevent leaks during rainy days. Also, ten minutes before closing time is allotted for the cleaning of the workplace.

Institutionalization of ISO 9001:2008 to the Entire System of Philippine Nuclear Research Institute (PNRI)

As one of the service institutes of the DOST reponsible in undertaking research and development activities, as well as in the institution and enforcement of regulations on the uses of nuclear energy, the PNRI expanded its QMS implementation to continuously provide excellent services to its clients. The MIRDC provided orientation and guidance in the preparation of additional documents according to ISO 9001:2008 requirements. Moreover, an Internal Audit seminar was conducted to develop additional internal auditors who could help assess the implementation of the system prior to the certification audit by their chosen certifying body.

SUPPORT TO THE ESTABLISHMENT AND IMPLEMENTATION OF THE QUALITY MANAGEMENT SYSTEM FOR THE METALS & ENGINEERING SECTOR'S BENEFICIARY FIRMS

In support to the M&E sector's quest to improve its productivity and be globally competitive, the MIRDC, through a Grant-In-Aid (GIA) project, provided free assistance to member firms of the MIAP, the PMAI and the PDMA in the establishment, implementation and certification of their Quality Management System based on ISO 9001:2008 standard requirements.

The MIRDC selected eight (8) beneficiary firms based on certain criteria – company size and existence, market scope, and commitment. The following were the activities undertaken by the representatives of both the MIRDC and selected firms:

(a) Discussion of the project implementation arrangements for the entire duration of the project and assessment of the respective organization's preparedness relative to the ISO 9001:2008 certification requirements;

(b) Provision of information on the background and importance of having an established Quality Management

Figure 3 – Results of 5S application during the workshop conducted by Ms. Lina B. Afable and Ms. Marcela R. Cagalingan on September 24 - 27 2013.

System (QMS) in conformance to ISO 9001:2008 and training of the members of the companies' technical working group regarding the development of the appropriate documentation needed by the organization for the efficient operation of its QMS;

(c) Facilitation of the development of the QMS and documentation requirements of the beneficiary firms. The MIRDC consultants assisted them through e-mails and phone discussions in the preparation of the necessary QMS documents and conducted initial reviews on their drafts. A visit was conducted for the review of their QMS documents and provided recommendations for the refinements and modifications to the reviewed documents;

(d) Conduct of a series of seminars/ workshops on Internal Quality Audit (IQA). This aims to guide the potential internal auditors of the beneficiary firms to plan and conduct an audit in accordance with ISO 19011:2002 standard; and,

(e) Assessment of the preparedness of the beneficiary firms for ISO 9001:2008 Certification through the conduct of implementation or pre-assessment audits.

Figure 4 – Conduct of seminars and implementation audit in preparation for Certification to ISO 9001:2008 of the seven (7) M&E firms from NCR, Regions IV-A, VII and XI.

Name of Company	Certifying Body	Date of Confirmation of Certification
NCR		
Supercast Foundry and Machinery Corp.	TUV – Rheinland	January 28, 2013
Region VI-A		
K.E.A. Industrial Corp.	TUV – Rheinland	December 18, 2012
Optitech Machine Tools	TUV – SUD	April 8, 2013
Region VII		
PERT, Inc.	TUV – SUD	January 18, 2013
Proline Industires Metal Works & Eng'g.	TUV – Rheinland	June 3, 2013
Region XI		
Davao Beta Spring, Inc.	TUV – Rheinland	March 1, 2013
Deco Machine Shop, Inc.	TUV - Rheinland	March 12, 2013

CONTINUING R&D INITIATIVES: IDENTIFICATION AND SELECTION OF EQUIPMENT FABRICATORS IN SUPPORT TO VARIOUS DOST PROGRAMS

One of the DOST interventions to the small and medium enterprises (SMEs) is to assist them in upgrading their equipment requirement according to their desired specifications and efficiency. The equipment upgrading activity directly improves the process line and quality of products and increases the SME's productivity. Oftentimes, their required machineries are available in the market. However, there are equipment that need to be fabricated locally to fit the specified requirements of the firms and also to take advantage of its cheaper cost and the ready access to preventive and corrective maintenance of the equipment. Thus, a DOST-GIA project – **"Identification and Selection of Equipment Fabricators in Support to Various DOST Programs"** was spearheaded by the MIRDC.

Under this project, a total of 309 metalworking shops were visited and assessed from sixty nine (69) provinces. After assessment, only 146 were considered capable of producing equipment and machines

Osamis Machine Shop, Misamis Occidental

Natomo Manufacturing, La Union

Marte Technova, Southern Leyte

P. Cortez Machine Shop, Siquijor

Mechaphil, Pampanga

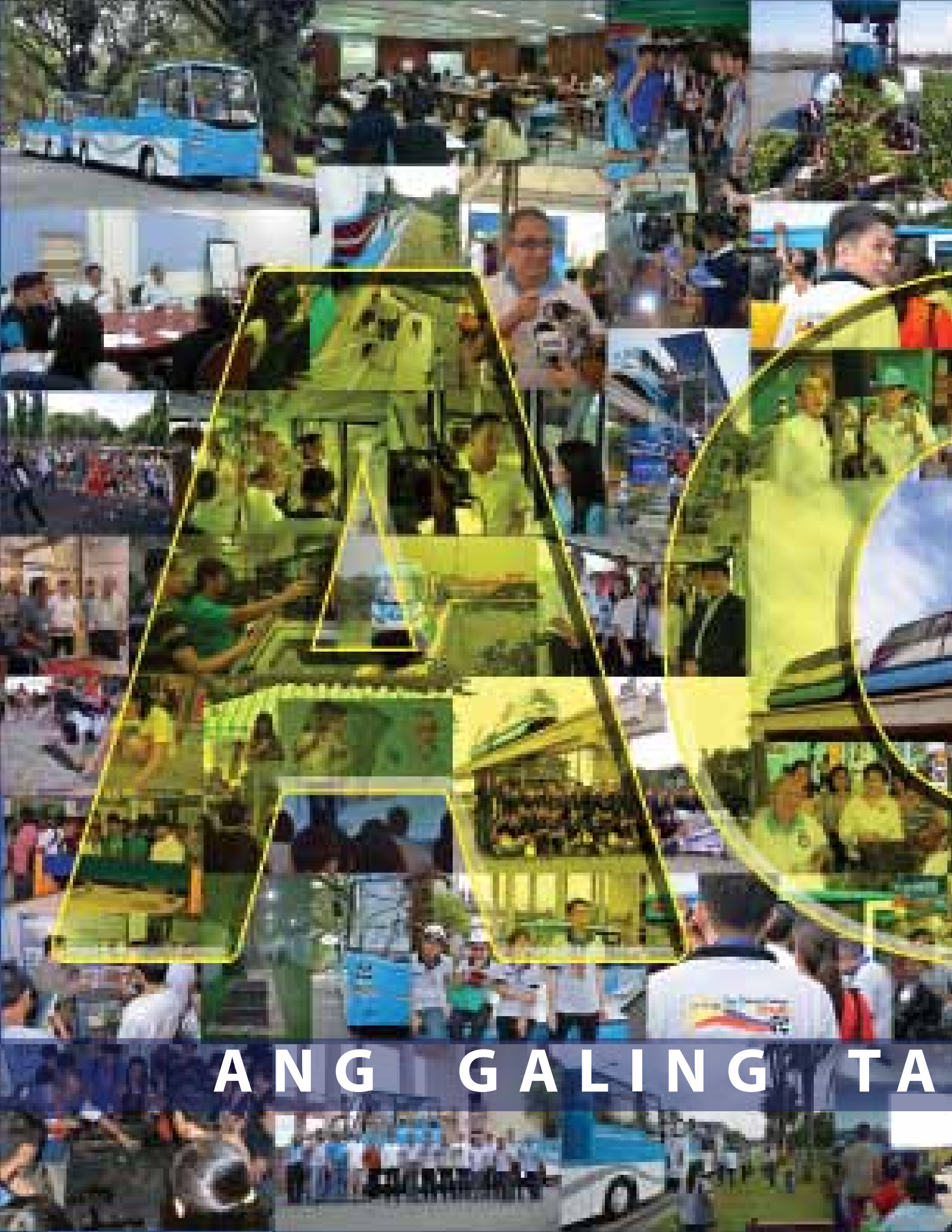
Gilmor A. Gahapon Metalwork, ZDN

Figure 5. Some of the visited and assessed metalworking shops.

Technology Demonstrations

One of the highlights during the open-house celebration of the 2013 M&E Week is the conduct of technology demonstration on (a) Spincasting, (b) Electroplating, and (c) Wrought Iron Fabrication with Mr. Adonis T. Marquez, Engr. Wilfredo R. Lim, and Mr. Laureano Dalay as the respective resource speakers. The event was attended by member-companies of various M&E associations and students from univerisities/colleges. The participants were overwhelmed on the resulting products of the said technologies.

Figure 6 – Demonstration on (a) Wrought Iron Production ,(b) Electroplating, and (c) Spincasting technologies during the M&E Week celebration on June 19, 2013 by Engr. Wilfredo R. Lim, Mr. Adonis T. Marquez and Mr. Laureano Dalay.



ANG GALING TA

LAGA NG PINOY

S&T SERVICES

analysis and testing division

Metals Industry Research and Development Center

The year 2013 has been a very productive year for the Analysis and Testing Division (ATD). Along with its commitment to continuously provide scientific and technological services for both the government and private sectors in the metals, engineering and allied industries, the ATD has reached another milestone by embarking on high-impact projects related to the advancement of the Philippine transportation system and in the revitalization of MIRDC facilities in support to the growing automotive parts and component manufacturing industries in the country. The dynamism exhibited by the division is a testament that the ATD is not only excellent in offering quality services but it also boasts of competitive staffs capable of doing world-class R&D activities, in support to the Department of Science and Technology's (DOST) mandate in leveraging science and technology (S&T) to create new and better products, processes, services, and systems to improve the lives of Filipinos.

CLS staff conducting phosphorus analysis (wet) in carbon steel and stainless steel samples.

S&T TESTING AND CALIBRATION SERVICES

The division continues to pride on its success of always performing above its target. For the fiscal year 2013, the division collectively earned 17.7 million pesos, breaching the target by 27%. For the past five (5) consecutive years, the division's revenue has been growing at a compounded annual growth rate of 2.88%. This growth is in congruence with the continuous increase of number of clients served, breaking the target of 1,100 clients by 4% more. Despite some ATD staffs spearheading several key projects and activities of the Center, the ATD managed to extend its services to 1,139 companies and accomplished 4,536 Job Orders, higher by 4% and 37%, respectively, as compared to the set 2013 target. Below is a detailed summary of accomplishments.

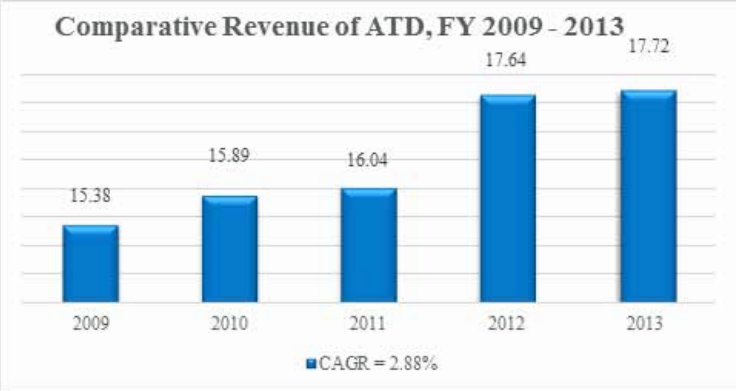
These successes can be attributed to the continuous pursuit of international recognition by the division. It has managed to continually maintain its accreditation for its Laboratory Management System conforming to ISO/IEC 17025: 2005. This is a testament that the tests and calibration services offered by the Center is comparable with those offered by international laboratories and the generated results are recognized by other countries traceable to International Laboratory Accreditation (ILAC).

In order to demonstrate the reliability of its testing services and its competence to the customers, the chemical, corrosion, mechanical and metrology laboratories actively participate in Proficiency Testing (PT) programs every year. The PT result for the Physico-Chemical

TABLE 1: 2013 Accomplishment summary of the Analysis and Testing Division.

PROGRAM/PROJECT/ACTIVITY	Annual Target	Actual Accomplishment	% Accomplishment to Annual Target
MFO – 3: S&T Services			
Revenue generated in Php '000	13,941	17,708	127
No. of Samples Tested/Analyzed/Calibrated	14,000	19,436	139
No. of Services Rendered	3,300	4,536	137
No. of Customers Served	1,100	1139	104

Figure 1. Comparative analysis of the revenue collected from fiscal year 2009 to 2013, showing a trajectory growth with a compounded annual growth rate (CAGR) of 2.88%.



Laboratory, which was provided by the Collaborative Testing Services, Inc. (CTS) and for the Corrosion Laboratory on Salt Spray Test which was provided by the National Exposure Testing (NET) were all satisfactory.

During the recent re-evaluation of the Philippine Accreditation Office (PAO) under the Department of Trade and Industry (DTI) in the year 2013, additional scopes on the analysis of Copper and Copper-Alloys and Aluminum and Aluminum-Alloys using Spark Optical Emission Spectrometer were recommended for the CLS. Two additional signatories were also accredited in the electrical scope of the instrumentation and metrology sections.

ATD INVOLVEMENT IN R&D RELATED ACTIVITIES

In support to the Center's changing R&D environment, the division spearheaded two major projects related to the advancement of the country's transportation system. With the harmonized [changed] Major Final Output (MFO) metrics, the ATD responded positively to the challenge of increasing the weight of MFO for R&D as compared from the previous years.

A. Prototype Development of a Hybrid Electric Road Train

Last December 18, 2013, the first public demonstration of the hybrid electric road train materialized at the compound of the University of the Philippines - Diliman in Quezon City. It was attended by no less than the DOST Secretary Mario G. Montejo, together with UP President Alfredo E. Pascual and some other selected personalities. The site demo was the conclusion of the first phase of the project which was to design and develop a two-coach hybrid electric road train prototype, which is totally independent of the existing designs of chassis. The demo is geared towards promoting the hybrid electric road train as a potential alternative for mass transport.

Phase 2 of the project, which started in the middle of 2013, aims to produce two (2) sets of road train including the prototype five-coach centrally-powered hybrid electric road train (CRT) and a light CRT version which is expected to be untilized in urbanized cities such as Baguio and Cebu. The basic design concept of the train is shown below. Its design features for the chassis, articulation and location of power train are unique, primarily addressing decrease in power losses.

This Filipino-made technology, including the installation of an efficient automatic fare system, is targeted to be demonstrated in mid-2014 to as-

Figure 2. Actual Photograph of a 2-coach Prototype Hybrid Electric Road Train during a public demonstration at UP Diliman.

sess its viability as an alternative mass transportation system. Moreover, it is considered the right approach to encourage a less polluting mass transit system. The effective implementation of this technology around key several areas is expected to help decongest the worsening traffic conditions of Metro Manila, on which according to the latest study conducted by JICA that the Philippines is losing P2.4 billion a day in potential income due to traffic congestion that eats up time that could have been used for productive pursuits. Hence, this project is considered vital in the socio-economic development of our country. Furthermore, the application of this hybrid electric vehicle can provide a scalable solution that improves the fuel mileage of the vehicle while at the same time decreasing emissions.

This project is currently being managed by the MIRDC in cooperation with the industry, government agencies and other involved sectors.

Figure 3. Concept Design of a Prototype 5-coach centrally Powered Road Train.

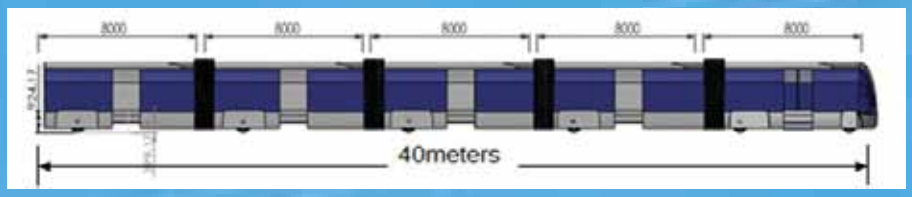


Figure 4. Three-dimensional projection of the Road Train when used as mass transport system.

B. Revitalization of MIRDC's Testing Facility in Support of the Automotive Components and Parts Manufacturing Sector

This project is one of the core projects under the Establishment of an Innovation Center for Motor Vehicle and Parts Development (iMoVe) Program in support to the Automotive Components and Parts Manufacturing Sector. The project aims to provide a state-of-the art testing facility that will enhance the competitiveness of the local automotive parts and components manufacturing industry to move up the value chain and attain global competitiveness. The new upgraded facility will also provide proper venue for these manufacturers to conduct R&D-related activities in order to improve their products.

The iMoVe Program was implemented with the purpose of helping in the design, prototyping and delivery of more reliable and safe Customized Local Road Vehicles (CLRVs), advance transport system (e.g. Road Train and AGT), and competitive automotive products. The testing facilities can be used in the assessment of safety of existing CLRVs, material qualification for stamping processes and in the evaluation of dies and molds.

In early 2013, an initial survey and assessment was conducted among local automotive parts industry players in order to gather information of their respective products and services. On May 14, 2013, a follow-up dialogue was held to accurately identify which automotive industry segment needs to be prioritized in terms of testing facility assistance. The outcomes of the activities enable the project team to identify priority equipment needed by the project's beneficiaries. Purchasing activities for the acquisition of the equipment were conducted during the last quarter of the year since the budget was only approved last September 2013. The equipment which are expected to be delivered until July 2014 are as follows: UTM (200T); Fatigue Tester; Micro Hardness Tester (Knoop/ Vickers); Vickers Hardness Tester; Brinell

1. *Source: Remo, M. (2013, July 6). Traffic costs P2.4B daily. Philippine Daily Inquirer.*

Figure 5. The Automotive Team with Dr. Agustin M. Fudolig as the Project Leader.

Figure 8. JICA experts and TESDA representatives joined by E-Vehicle Seminar participants.

Hardness Tester; Leeb Hardness Tester; Metallurgical Microscope; Magnetic Particle Test Bench; Thickness of Coating Tester; and Surface Roughness Tester.

Several plants tours were also accomplished to further gather technical information related to the identified equipment. The team visited Remcor (Caloocan), MESCO (Mandaluyong), Steel Asia (Bulacan), FPRDI (Laguna), and Mitsubishi Motors Philippines Corporation (Cainta) for this purpose. Also, two project members along with a representative from PCIEERD visited the Taiwan Automotive Research and Testing Center (ARTC) for possible trainings related to automotive testing.

The Project also organized a three-day seminar on "Advanced Information on Electric Vehicles Technologies." It was conducted on Oct. 2-4, 2013 by Japanese experts from the Technical Education and Skills Development Authority (TESDA) and was attended by different MIRDC Project Leaders and members together with delegates from the PMEDSO, PCIEERD and TUP faculty. The said activity was organized to prepare the members of projects involved in the Advanced Transportation System (ATS) with regard to the use of electric technology in various vehicles.

LABORATORY REHABILITATION AND WORKFORCE DEVELOPMENT

The ATD recognizes the need to enhance the competency of its personnel and to improve the workplace environment in order to effectively offer quality services to its target clients. Training programs were implemented in 2013 for laboratory staffs to address continuous adherence to excellence.

In 2013, two staffs from both the Mechanical and Instrumentation Laboratories pursued higher degree studies in the field of Mechanical Engineering and Electrical Engineering (Power Systems). Upon finishing their graduate studies, they are expected to further contribute to the dynamic R&D culture of the ATD.

Two staff from the CLS were also sent to Kuala Lumpur, Malaysia to train on the proper operation and troubleshooting of the newly acquired hybrid-optic spark-type Optical Emission Spectrometer (OES), which is being used in accurately quantifying the percent composition of the base metal and its alloying elements. Also, an in-house seminar on Good Laboratory Practices (GLP) was conducted by the CLS Unit Heads in order to further promote among staff proper handling of different laboratory activities.

Figure 6. Project members during their site visit at Steel Asia.

Figure 7. The team during their visit at the MMPC, Cainta assembly line (left), and ARTC, Taiwan representatives together with delegates from MIRDC & PCIEERD (right).

Figure 9. Unit Heads from the Physico-Chemical laboratory were trained to handle, operate and troubleshoot the newly acquired Spark OES. The said training was conducted at the QES regional office in Kuala Lumpur, Malaysia.

A staff from the Metrology Laboratory was also sent to Singapore and Malaysia last November 2013 to attend the international benchmarking for the project "Strengthening of Regional Metrology Laboratory Services." The said seminar-workshop aimed to update the Center on the current standards and quality system practices from the National Measurement Institutes (NMI). Another staff from the IMS also undergone a six-month training on Public Management Development, a program offered by the Development Academy of the Philippines (DAP) for middle managers class. The said training aimed to enhance the managerial capabilities of potential managers in the laboratory.

Laboratory rehabilitation and improvement were also carried out for all laboratories. The CLS acquired a new scrubber, an equipment useful in neutralizing the acidic emissions during the dissolution of metallic samples.

PARTICIPATION IN TECHNICAL COMMITTEES FOR STANDARDS FORMULATION AND INDUSTRY SUPPORT

The ATD provided support to the development of the Philippine National Standards (PNS) through active participation in Technical Committees (TC) on standards formulation of the Department of Energy (DOE), Philippine Accreditation Office (PAO), Bureau of Product Standards (BPS) and the Department of Transportation and Communication (DOTC). ATD staffs are regularly invited to help these government institutions develop the PNS specific to their departments.

The technical committees participated in by the ATD technical personnel were the following:

- Jewellery (TC-54)
- Gas Cylinders (TC-6)
- Vehicle Harmonization and Standardization

Meanwhile, the Instrumentation and Metrology Laboratories are requested by the DTI-PAO as reference laboratory to support measurement audit activities of the following laboratories: Philippine Geoanalytics Calibration and Measurement Laboratory, Welltech Service Corporation, Ark-One Technologies, Inc., Premier Physic Metrologie, Acculab Calibration Laboratory, Inc., Sonju Engineering Services, and Powerite Philippines International Corporation.

Most ATD staffs are also recognized by the PAO as Technical Assessors for Calibration, Mechanical and Chemical Laboratories.

HIGHLIGHTED ATD ASSISTANCE TO EXTERNAL CLIENTS

The division takes pride on its active presence in the community when it comes to providing testing services and assistance. In 2013, the ATD was involved in helping resolve cases that were worthy of note due to its relevance and impact to the society.

A. DOTC MRT 3 Assistance

The Mechanical Laboratory conducted hardness and compression testing on the samples submitted by the DOTC MRT 3 to further assess and evaluate the quality of the railway. With the results provided, the people in-charge

Figure 10. From top: Rail sample and wheel sample for hardness testing, and the actual compression testing of the sample using Universal Testing Machine (UTM).

Figure 11. From top: Tension test of handle seat, and motorcycle roller chain for breakingload test.

Figure 12. Actual hydrostatic testing of PSV Test Bench by one of the MML staff.

were able to address and implement proper remedies to their problem.

B. Mechanical Testing Assistance to Various Manufacturers

Different automotive and motorcycle parts from the manufacturing sector were given assistance by means of conducting tests to compare different mechanical properties of various brands of handle seats, motorcycle roller chain, sprocket and taxi meter seal.

In addition, a locally made valve testing system was tested by the laboratory to determine if the quality of workmanship and functional characteristics will comply with the standard product line.

C. Participation to the Ayala-Serendra Case Investigation

With the explosion incident at "Two Serendra Section B Tower A" McKinley Parkway Drive, Bonifacio Global City, Taguig last 31 May 2013, the professional insight of personnel from the ATD was sought through the conduct of both chemical and physical testing of collected specimens that were turned over by the Department of Interior and Local Government-Inter Agency Task Force (DILG-IATF) and the Makati Development Corp. (MDC) to help arrive at a conclusion regarding the cause of the explosion.

Figure 13. Clockwise: (a) June 17, 2013, the PLS section chief, DILGF-IATF representative and the MIRDC legal officer discussed the scope of work prior to the testing of specimens [evidence], (b) June 22, 2013, the actual turnover of specimens to the mechanical-metallurgy laboratory, (c) and (d) actual testing of evidences from June 25 to July 1, 2013.

D. Training Assistance to the DOH-National Nutrition Council

Selected personnel from the IMS extended assistance to the Department of Health-National Nutrition Council (DOH-NNC) with regard to their project: ***Competency Training on Calibration and Verification of Wooden Height Board and Weighing Scale.*** The said training project is in support of NNC Governing Board's Resolution No. 2, S. 2008 entitled "Adoption of the New WHO Children Growth Standards for use for children 0-5 years old in the Philippines."

The project aimed to impart technical skills among local nutrition workers on how to verify wooden height boards and weighing scales, which are used in accurately measuring the growth indicators of children. The IMS staff, aside from being resource speakers, also helped in authoring the draft guidelines on the verification of height board and weighing scale. The trainings were conducted to four island clusters: Luzon; NCR; Visayas; and Mindanao. A total of eight batches were served in this training.

BUILDING ORGANIZATIONAL EXCELLENCE

planning and management division

Metals Industry Research and Development Center

ESTABLISHING INTERNATIONAL LINKAGES, BUILDING ALLIANCES

Driven by the vision of becoming an internationally recognized institution in the field of research and development (R&D), technology transfer and scientific and technological (S&T) services supporting the growth and global competitiveness of the metals, engineering and allied industries, and with the regional integration as a result of the ASEAN Economic Community 2015 fast approaching, the Metals Industry Research and Development Center (MIRDC) intensifies collaboration efforts with foreign organizations through initiatives geared towards the development of the local M&E industries.

For 2013, the Planning and Management Division (PMD), a newly-formed division under the Office of the Executive Director which is in-charge of the development of international linkages of the Center had successfully worked for the approval of another Disaggregated Grants-in-Aid (DGIA) project in alignment with the vision in addition to the clustering project currently being implemented. Likewise, coordination and assistance were also extended to R&D divisions for the approval of project proposals supporting the productivity and competitiveness of the industry.

Indeed, the year was highlighted with the signing of one international linkage agreement and study missions to other countries in the pursuit of fulfilling the vision of being an internationally recognized institution supporting the growth and competitiveness of the local M&E industries.

A. DOST, Philexport and CBI form alliance to support export competitiveness of local MSMEs

I. MOU and MOA Signing

The Department of Science and Technology (DOST), the Philippine Exporters Confederation, Inc. (Philexport) and the Centre for the Promotion of Imports from Developing Countries (CBI), an agency of the Ministry of Foreign Affairs, Kingdom of the Netherlands, formalized its partnership to support the export competitiveness of the M&E industries to the European and regional market.

The Memorandum of Understanding (MOU) was signed by Mario G. Montejo, Secretary of DOST; Sergio R. Ortiz-Luis Jr., President and Chief Executive Officer of PhilExport; and Ank Willems, Deputy Head Mission of the Embassy of the Kingdom of the Netherlands in the Philippines representing the CBI in a signing ceremony held at Diamond Hotel, Manila on 9 September 2013. Also, a Memorandum of Agreement (MOA) between the MIRDC, Philexport – National, Philexport – Cebu and CBI was also signed. The signatories to the MOA were Assistant Secretary of DOST and the concurrent Officer-in-Charge of the MIRDC, Robert O. Dizon, the President of Philexport Cebu, Venus C. Genson, Sergio R. Ortiz-Luis Jr. of Philexport – National and Ank Willems of CBI.

The cooperation spells out the CBI's assistance to the local M&E firms to be able to tap the European and other regional market in the context of CBI's Metalworking Sector Asia – Philippines Program and to implement a Business Support Organization Development (BSOD) program to strengthen relevant organizations for sustainable export development activities.

II. Market Research/Access Requirements Seminar, Technical Training Foundries and Process Control Seminar

Specified on the signed MOU is the commitment of the CBI to provide and sponsor technical assistance and export expertise through trainings, consultancies and access to European trade fairs exhibit. Thus, the initial activities under this collaboration project were the conduct of three (3) technical trainings that were beneficial in the implementation and management of the project as well as in capability upgrading of the local M&E industry.

The first training was the CBI Seminar Workshop on Market Research/Access Requirements held last 11-12 September at Diamond Hotel, Manila. Among the topics discussed were the following:

The said seminar workshop was participated in by Ms. Mercedita G. Abutal, Project Leader of the Local CBI Project; Ms. Linda G. Rivera, Head of the PhilExport Counterpart; Ms. Lina B. Afable, Chief of the Technology Information and Promotion Section (TIPS); and Ms. Rea C. Castro, Head of the Project Monitoring Office (PMO) to be established at the MIRDC.

Topic	*Resource Person*
1. Introduction of trade flow analysis with identification of potential markets	Alfons van Duijvenbode
2. Seeking essential market information through CBI market reports and other relevant sources for market trends and potential business partners	Allan O. Gozon
3. Legislative and non-legislative requirements that may impact export to Europe	Allan O. Gozon

Another training conducted was the Technical Training Foundries held on 4-5 October 2013 at the New Auditorium, 3rd Floor, Laboratories Bldg. of the MIRDC. The two-day seminar aims to provide the latest techniques for producing castings, specifically on ductile iron castings.

The Process Control Seminar was conducted on 7-9 October 2013 at the 5th Floor, Bayview Salon, Hyatt Regency Hotel, Manila. This is a three-day seminar workshop which focused on the use of "learning-by-doing approach" in imparting knowledge on how to implement operational process control. Engr. Lemuel N. Apusaga and Engr. Jayson P. Rogelio, Senior Science Research Specialists of the Materials and Process Research Division (MPRD) and the Prototyping Division (PD), respectively, attended the said seminar.

The Technical Training Foundries and Process Control Seminar were participated in by members of the association, foundry owners and employees, manufacturing companies, and institutions involved in supporting the local M&E sector. The lecture for both the sponsored activities was given by Mr. Staf Henderieckx, International Foundry Expert of CBI.

Technical Training Foundries conducted by Mr. Staf Henderieckx.

III. The Local CBI Project

Having been identified by the CBI as the major supporter of the M&E sector in the country and a potential partner in implementing support programs to improve the export environment of the local M&E sector, the MIRDC successfully worked for the approval of the DGIA project entitled ***"Support to the Development of the Foreign Market of the Metals and Engineering Industries through Collaborative Efforts with the Metalworking Sector Asia Project – Philippines, of the Center for the Promotion of Imports from developing countries, Ministry of Foreign Affairs of the Kingdom of the Netherlands (CBI)"*** during the latter part of the year. This is in fulfilment of one of the conditions of the MOA where the MIRDC, as the lead implementing agency, shall implement a counterpart project to complement the CBI activities.

The objective of the project is to develop the export competitiveness of the M&E sector to be able to tap the European and regional markets through collaborative efforts with the Metalworking Sector Asia – Philippines project of the Center for the Promotion of Imports from Developing Countries of the Netherlands Ministry of Foreign Affairs (CBI). Specifically, it seeks to: 1.) Support the development of the export market of ten (10) M&E firms classified as Level 2 partner companies through training, consultancy and other capability upgrading activities; and, 2.) Participate in the Export Coaching Program (ECP) and other capability building activities to be implemented by the CBI.

On the onset, the project shall assist in the development of the export market specifically of the Level 2 companies which did not pass the CBI criteria but possess the capability to export given the required technical assistance. The project will also be an opportunity for the MIRDC to develop capability in identifying and developing potential market for local M&E firms. Export market development is an area where the MIRDC needs to develop its competency, hence, the plan for the MIRDC to be a Business Support Organization (BSO) under the CBI is a welcome opportunity to expand its business economic advisory services. To maximize the project benefits, coordination shall be done with concerned agencies and regional offices for inclusion of the beneficiaries under the Small Enterprise Upgrading Program (SETUP) and other DOST programs.

A project team meeting was organized at the MIRDC on 19 December 2013 in order to finalize the plans and targets of the project as well as to identify the strategies to be implemented. This was attended by Mr. Allan O. Gozon of Philex-

Meeting with PhilExport.

Presentation of the ICAMT Project Proposal to industry partners of the MIRDC held on 11 December 2013.

port – Cebu, Ms. Therese Gigi Digal and Ms. Dang Aparejado of Philexport – National and the Project Team headed by the Project Leader, Ms. Mercedita G. Abutal.

The said project is one of the sub-components of the Support Program for the Productivity and Competitiveness of the Metals and Engineering Industries with approved working budget of Php 3.5 million for Year 1 implementation.

B. MIRDC collaborates with UNIDO for the establishment of ICAMT-Philippines

The MIRDC is currently working for the approval of the project entitled ***"Establishment of International Center for the Advancement of Manufacturing Technology (ICAMT)"*** proposed for funding by the United Nations Industrial Development Organization (UNIDO).

Patterned after the successful UNIDO-ICAMT in India, the proposed project aims to establish a similar center at the MIRDC in Bicutan, Taguig City, Philippines, as a recognized international center that caters to local and international clients for the advancement of manufacturing technologies. The project, as envisioned, will contribute to the development of new product range with the use of advancements in technology and best international manufacturing practices which will complement the agency's facilities for tool and die, machine design and metal casting. This will enable the M&E and allied industries to produce locally developed technologies and implement innovations to be at par with global standards and address the impending needs of the manufacturing industries in the country.

A presentation of the project proposal was conducted on 11 December 2013 at the MIRDC for industry associations and other collaborators of various MIRDC activities to have an overview of the ICAMT project as well as an opportunity to get comments and inputs. Dr. Anders Isaksson, UNIDO Industry Development Officer, and Goradz Rezonja, Consultant of UNIDO Headquarters in Vienna, Austria, visited the MIRDC together with some representatives from the UNIDO Philippines on 16 December 2013. The objective of the visit is

Mr. Goradz Rezonja (extreme left) and Dr. Anders Isaksson (second from left) of the UNIDO headquarters in Vienna, Austria together with the officers from the UNIDO Philippines held a meeting with the MIRDC top management on 16 December 2013.

Stakeholders' Forum and Focus Group Discussion for the ICAMT-Phils. held at the Heritage Hotel Manila on 17 December 2013.

to align and discuss with the MIRDC and the Department of Trade and Industry (DTI) the plans of establishing such facilities in the Philippines.

The results of the two abovementioned activities were summarized and finalized in the Stakeholders' Forum and Focus Group Discussion conducted at The Heritage Hotel Manila on 17 December 2013. The said activity provided both government and industry players an opportunity to show commitment, unity and determination to implement and complete the ICAMT project successfully. The stakeholders' forum served as validation of the project proposal and will be instrumental in securing the UNIDO's approval to set up the ICAMT facilities that are envisioned to best address the unique needs of our country's manufacturing industries.

C. Study Visits to Taiwan and South Korea

Under the DOST-GIA project entitled ***"Capacity Building for the Competitiveness of the Metals and Engineering Industry Cluster (CAIMTEC) of CAR for the Localization of Industrial and High Precision Technology Parts",*** two (2) international study visits were conducted in Taiwan and South Korea in 2013. Said visits were one of the major highlights of the project in its second year of implementation.

Taiwan

The MIRDC, represented by Ms. Mercedita G. Abutal and Dr. Danilo N. Pilar attended the 2013 Taipei Summit with the theme ***"Smart Life Technology: Reshaping the Future of Asia"*** on 8-9 October 2013 in Taiwan. Alongside the participation to the summit, the representatives also conducted exploratory meetings with the Institute for Information Industry (III), Taiwan Aerospace Industry Association (TAIA) and Aerospace Industrial Development Corporation (AIDC). Said mission is in support of the Letter of Intent (LOI) signed between the Manila Economic and Cultural Office (MECO) and the Taipei Economic and Cultural Office (TECO).

Organized by the Taiwan External Trade Development Council (TAITRA), the summit seeks to impart knowledge on the application of Information and Communications Technology (ICT) to everyday life particularly in education,

health, traffic, transportation system and the like. Meanwhile, the meeting with III is a follow-up of the previous discussions, in coordination with DTI-BOI, relative to the proposed ICT- based CNC learning which is a five-step ladderized approach. The exploratory meetings with the TAIA and AIDC are envisioned to be the start of a collaborative undertaking with the MIRDC and the Aerospace Industries Association of the Philippines (AIAP) where Ms. Abutal is the MIRDC's representative in the Board of Trustees.

The results of the study mission are deemed beneficial for the implementation of the project activities specifically on the establishment of a common service facility at the DOST-CAR in Benguet where a CNC machining center shall be installed.

South Korea

On 2-7 December 2013, another study visit was conducted to government agencies of South Korea that are implementing and promoting industry clustering as a strategy for development, technology business incubation, aerospace and high-precision technology parts manufacturing. The delegation was composed of a team of science specialists from the MIRDC, the DOST-CAR and the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD).

Among the organizations visited were the Korea Institute for Advancement of Technology (KIAT), Korea Industrial Complex Corporation (KICOX), Korea Institute of Industrial

Technology (KITECH), Korea Institute of Machinery and Materials (KIMM) and Small and Medium Business Administration. The delegation learned about the best practices especially in the organization and management of industry clusters and of institutions supporting the small and medium enterprises of Korea, particularly those engaged in machinery and parts manufacturing. This will be helpful in the formulation of policies and guidelines in the successful operation and management of the Common Service Facility (CSF) to be established in CAR, as well as in identifying future activities of the CAI-MTEC cluster.

Among the highlights of the celebration are the awarding of the MIRDC Legacy Trophy and the M&E Man of the Year, the Introduction of Partnerships and the Signing of the Memorandum of Understanding between the MIRDC and the newly-included partner associations to the MakiBayan program.

Recipient of both prestigious awards is former president of the Philippine Foundry Society (now known as the Philippine Metalcasting Association, Inc.) and the first president of the Metalworking Industries Association of the Philippines Inc. (MIAP). The award was presented to Mr. Raul M. Consunji in recognition of his crucial contributions that led to the growth and dynamism of the metalworking industry.

The awarding was followed by the Introduction of Partnerships. The MIRDC is proud of expanding its linkages with the private sector, which now includes: the Philippine Welding Society (PWS); the Philippine Metalcasting Association Inc. (PMAI) and the Original Equipment Manufacturer's Association of the Philippines (OEMAP).

To formalize the commitment of both parties to the MakiBayan program, a Memorandum of Understanding between the MIRDC and the newly-included partner associations was signed. The signatories were Engr. Robert O. Dizon – Assistant Secretary of DOST and Officer-in-Charge of MIRDC; Mr. Harvey Uy – PMAI President; Mr. Eric J. Montes – PWS President; and Mr. Horacio Freires – former president of the OEMAP representing the association's incumbent president, Mr. Emmanuel M. Aram.

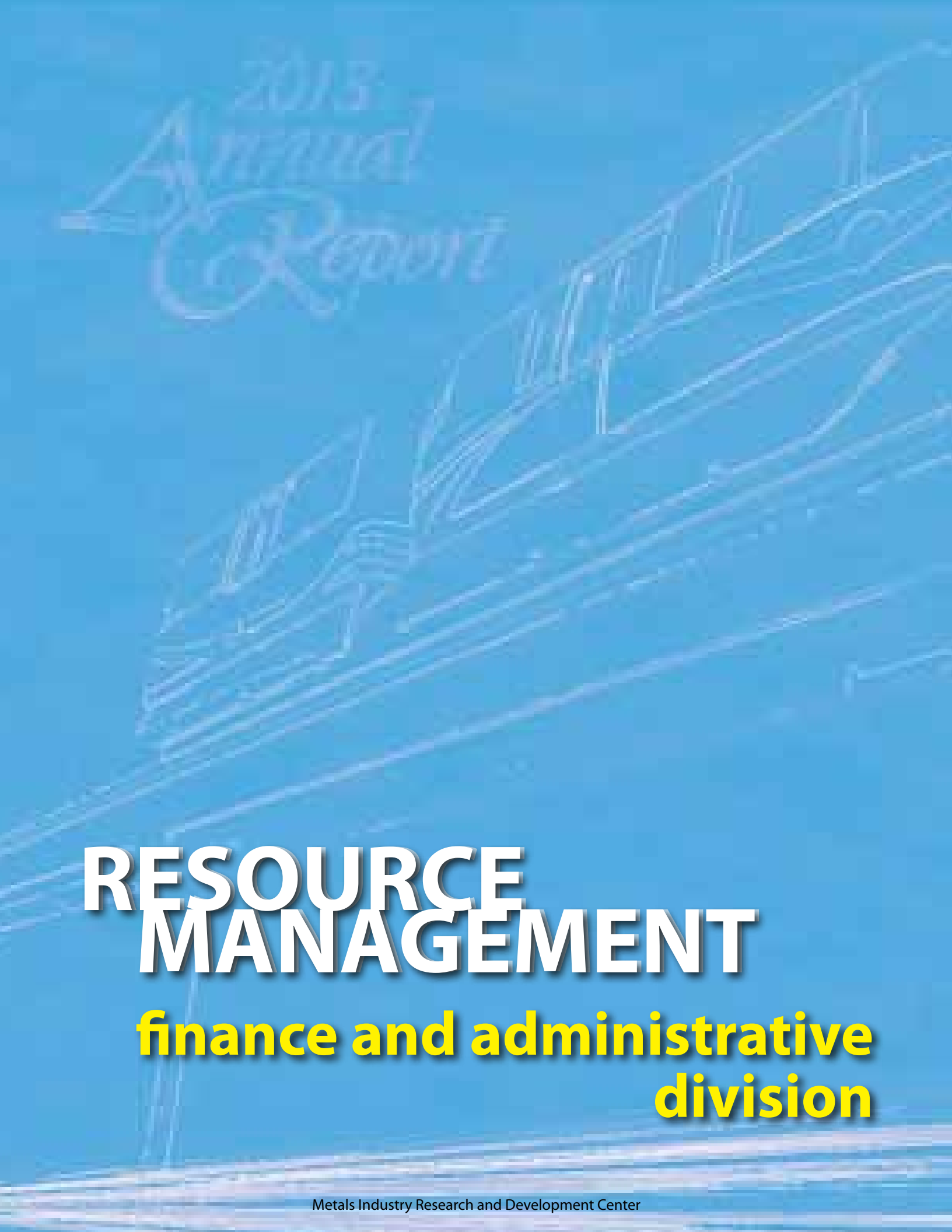
Geared towards the initiation and implementation of programs and projects that would focus in the localization of technologies, the MIRDC is confident that with the full support and cooperation coming from the expanding pool of partner associations, local technologies will surely work.

D. MIRDC expands local partnerships through the celebration of the 2013 M&E Week

Once again, the MIRDC, in partnership with the Metal Engineering Industry Foundation, Inc. (MEIFI) successfully held the Metals and Engineering (M&E) Week celebration on 18 June 2013 at the Hyatt Hotel Manila. The annual celebration is in compliance to Presidential Proclamation No. 144, signed by His Excellency President Benigno S. Aquino III in April 2011 which declared the period from June 13 to 18, 2011 and every third week of June thereafter as M&E Week.

With the theme "MakiBayan 2013: Moving Forward through Faster and Safer Transportation," this year's event served as a venue for the presentation of the Center's transportation-related programs and projects as well as a vehicle for the expansion of MakiBayan partnerships. DOST Secretary Mario G. Montejo, along with Undersecretary Corazon Jimenez of the Metropolitan Manila Development Authority (MMDA) representing Chairman Francis N. Tolentino as the Keynote Speaker, were present during the event and inspired everyone to support the initiatives of the DOST.

The new MakiBayan partners: Mr. Horacio Freires of the OEMAP (first from left); Mr. Luis Antonio Fuster of the PDMA (second from left); Mr. Harvey Uy of the PMAI (second from right); and Mr. Eric Montes of the PWS (right). They are joined by Engr. Remartin Maglantay who presented the Finite Element Analysis project.



RESOURCE MANAGEMENT

finance and administrative division

Metals Industry Research and Development Center

administrative & general services

PERSONNEL STRENGTH

From its total Plantilla Positions of 226, there are 206 filled positions at the MIRDC as of December 31, 2013. The MIRDC congratulates 11 promoted employees and welcomes seven (7) newly-hired employees.

PROMOTED EMPLOYEES

JONATHAN Q. PUERTO
Deputy Executive Director III
Office of the Executive Director

He holds an MS degree in Public Management and is a recipient of the Division Model Employee and NSTW Model Speaker awards. The former Chief of the Materials and Process Research Division is a hardworking, generous and sincere person who has nurtured a blissful relationship with his co-employees.

FLORALE G. GAMO Administrative Assistant III Prototyping Division (detailed at the Office of the Deputy Executive Director for Research and Development)		**MELCHOR A. GAMILLA** Science Research Specialist II Materials and Process Research Division	
MA. GIRLIE M. MILLO Supervising Science Research Specialist Technology Diffusion Division		**KATHERINE T. LLANTO** Administrative Officer I Finance and Administrative Division	
CELSO L. AGUSANDA Metals Technologist V Materials and Process Research Division		**SHEENA S. BEDIS** Administrative Officer IV Planning and Management Division	
MERVIN B. GOROSPE Senior Science Research Specialist Technology Diffusion Division		**RAMON M. MARTIN** Metals Technologist V Prototyping Division	
ROSARIO D. SANCON Administrative Officer V Finance and Administrative Division		**MILDRED J. VIERNES** Information Systems Researcher II Planning and Management Division	

NEW EMPLOYEES

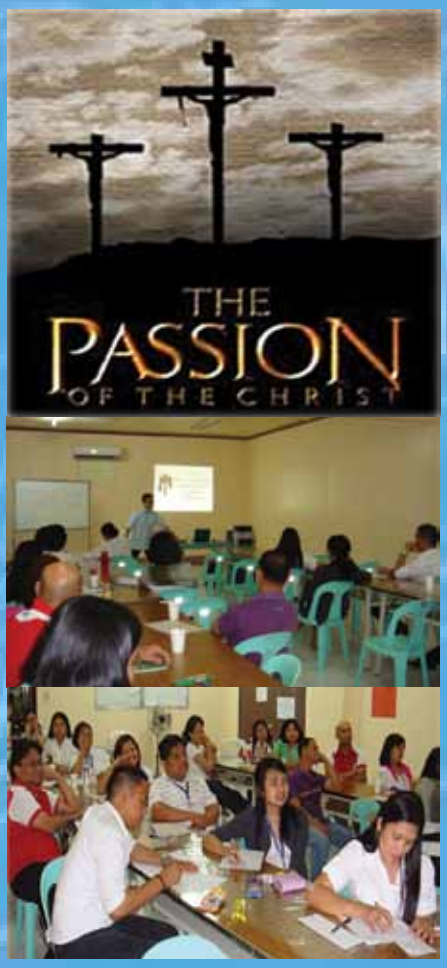
JAMES ASHER B. CABARLOC Laboratory Technician I Analysis and Testing Division	**KARL ANDREW S. CHAVEZ** Laboratory Technician I Analysis and Testing Division
ARVIN YAN V. PACIA Science Research Specialist II Analysis and Testing Division	**ANTHONY GREG F. ALONZO** Planning Officer III Planning and Management Division
CHARLES EDWARD L. ALVIAR Science Research Specialist II Analysis and Testing Division	**KRISTINE A. GEALAN** Administrative Assistant I Planning and Management Division (detailed at the Prototyping Division)
ALBERTO M. OLIVA Administrative Assistant IV Finance and Administrative Division	

MANAGEMENT COMMITTEE TEAMBUILDING

The Administrative and General Services Section of the Finance and Administrative Division (AGSS-FAD) conducted a Teambuilding Activity for its Management Committee in recognition of the importance of teamwork in attaining the Center's goals. It was held on January 17 -18, 2013 at the Sol Y Viento Mountain Hot Spring Resort, Calamba, Laguna. The activity aimed to cultivate a culture of cooperation and readiness to face organizational challenges through a better understanding of group dynamics. The said activity helped the participants learn effective ways of leading a team and developing a stronger support system amongst Committee members.

RECOLLECTION

To enrich the employees' values and spirits, Fr. Cristmar I. Daguno of SPHL –Shrine of St. Therese offered a Recollection last March 20, 2013 at FAD Multipurpose Room.



WOMEN'S MONTH CELEBRATION

Once again, MIRDC actively joined the celebration of Women's Month themed "Kababaihan: Gabay sa Pagtahak sa Tuwid na Daan." The 2013 Women's Month Celebration focused on highlighting the need to accelerate women's participation in governance, enhancing gender perspective in upholding good governance, strengthening the mechanisms and institutions that support women, and widening the arena for their participation. Held on March 25, 2013 at the DOST grounds, activities included health and wellness, beauty make over through the "Kagandahang Ricky Reyes," aerobics concert and forum on various DOST flagship programs that addressed the needs of men and women such as Project NOAH, Brown Rice with Nutrition Counseling, Information, Communications and Technology, Agriculture and Aquatic S&T on Women Entrepreneurship.

MIRDC TEAMBUILDING

From its 2012 summer get-away held in the north, the MIRDC went south to have its 2013 Teambuilding and the opening of its interdepartment Sports Fests. It was held at One Laiya Beach Resort, San Juan, Batangas on May 2 to 3, 2013. It was a remarkable moment as DOST Assistant Secretary Robert O. Dizon, our newly- appointed Officer-in-Charge, joined and enthusiastically participated in the activity.

Hosted by Engr. Miles P. Austria Jr., Ms. Millet A. Mangunay and Engr. Mervin B. Gorospe, the highlights of the two-day activity included parade of colors of sports' teams with their muse,





cheering competition, presentation numbers of contract of service personnel and newly-hired employees, and team building activities.

DOST-WIDE HEALTHY LIFESTYLE AND PHYSICAL ACTIVITIES

Equally important is the health and fitness of employees.

To support a well-balanced workforce, the MIRDC actively participated in the annual DOST-wide wellness activities on June 7, 2013 at the DOST Grounds. This year's activity started with a fun run followed by aerobics, opening of sports fest and cheer dance competition.

Proud as ever, the MIRDC, together with the National Research Council of the Philippines (NRCP), Philippine Textile Research Institute (PTRI) and the Department of Science and Technology (DOST) representing south cluster, won first place in the cheer dance competition. Further, our very own employees grabbed places in the 4.5k Fun Run: Mr. Joel A. Eligue, 1st placer, Ms. Christine P. Avelino, 3rd placer, Marie Sharon S. Abilay, 6th placer and Marie Dolly T. Borlado, 7th placer.

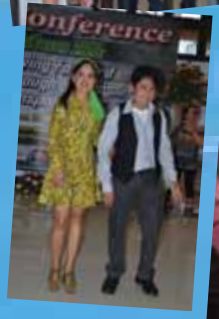
CELEBRATING MIRDC 47TH FOUNDING ANNIVERSARY

One of the anticipated events of the year is the celebration of the MIRDC anniversary.

It started with a tree-planting activity inside the MIRDC Compound on June 20, 2013. The main event was held in its new Auditorium on June 21, 2013. With a theme, "MIRDC Goes Retro," MIRDC officials and employees took efforts to search from their "baul" of old clothes the most appropriate attire to represent their assigned "dekada." Honorable Mario G. Montejo, DOST Secretary and Chair of the MIRDC Governing Council, took time out from his busy schedule to deliver his anniversary message for the MIRDC.

The event was made even more memorable as the divisions presented their production numbers where their creative ideas and competitive spirits were showcased. All numbers deserved praises but there should be a winner. The Finance and Administrative Division (FAD) and the Analysis and Testing






Loyalty Awards

Performance Excellence

Innovation

Core Value

Best Organizational Unit

Division (ATD) were declared the Champions. Ms. Melanie V. Espresion of Planning and Management Division (PMD) and Engr. Ivo Mathew D. Cruz of Finance and Administrative Division won the Best in Dekada Costumes respectively for female and male category.

The celebration will never be complete without recognizing employees' contributions.

This year, the PRAISE, bestowed Performance Excellence Award to fifty-two (52) employees, Loyalty Award to twenty-eight (28) employees, and Core Values Award to five (5) employees. Special Awards were also given to the Best Organizational Unit and to employees with new ideas in improving quality of work that benefited the clients and the Center.



Dekada 60 Dekada 70 Dekada 80



LOYALTY AWARDS

RECIPIENT	DIVISION
Thirty-five (35) Years	
1. Ruben L. Sepagan	PD
2. Evelyn D. Inventor	FAD
3. Johnny U. Reyes	FAD
4. Agnes I. Josef	TDD
5. Ramon M. Martin	PD
6. Blesilda P. Cabaña	FAD
7. Rolando Y. Clavio	FAD
8. Myrna M. de Guzman	FAD
9. Vilma A. Sia	TDD
Thirty (30) Years	
1. Galicano M. Enerlan	FAD
2. Tirso P. Entereso	PD
3. Celso L. Aguisanda	MPRD
4. Ernesto S. Sambo	MPRD
Twenty-five (25) Years	
1. Jocelyn F. Dime	TDD
2. Jonifer Rose D. Bernaldez	FAD
3. Norma B. Garcia	PMD
4. Wilfredo R. Lim	TDD

RECIPIENT	DIVISION
Twenty (20) Years	
1. Agnes F. Pedraza	FAD
2. Florante A. Catalan	ATD
3. Cornelio Y. Baldon	MPRD
4. Salvacion V. Ruiles	MPRD
5. Jyrwen A. Ayao	MPRD
6. Ariel R. Sernal	MPRD
7. Gina A. Catalan	ATD
8. Marlene R. Rafanan	TDD
9. Raymond S. de Ocampo	PD
Ten (10) Years	
1. Ronaldo L. Agustin	TDD
2. Eric B. Casila	PMD

SPECIAL AWARDS FOR THE YEAR 2013

RECIPIENT		DIVISION
Best Organizational Unit for exemplary performance and contribution in attaining the Center's performance targets and steadfast adherence to the MIRDC vision of organizational excellence	Industrial Training Section	TDD
CORE Value for demonstration of exemplary service and conduct through the consistent observance of MIRDC Core Values	Rosario D. Sancon	FAD
	Joey G. Pangilinan	MPRD
	Gharry M. Bathan	PD
	Eduardo V. Diasanta Jr.	ATD
	Lina B. Afable	TDD
Innovation for new ideas in improving the quality of work which redounds to the benefit of clients and the Center	Juanito G. Mallari	MPRD
	Lito I. Dimaculangan	ATD

PERFORMANCE EXCELLENCE AWARDS

RECIPIENT	DIVISION
Four (4) years Outstanding Performance 2009-2012 - Gold	
1. Marcela R. Cagalingan	FAD
2. Jocelyn F. Dime	TDD
3. Marlene R. Rafanan	TDD
4. Ligaya R. Rubis	TDD
5. Luis C. Forbes	ATD
6. Agnes I. Josef	TDD
Three (3) years Outstanding Performance 2010-2012 – Gold	
1. Celso L. Aguisanda	MPRD
2. Jyrwen A. Ayao	MPRD
3. Romeo C. Bermudez	MPRD
4. Gabriel D. Galotia	MPRD
5. Juanito G. Mallari	MPRD
6. Joseph A. Romero	MPRD
7. Ariel R. Sernal	MPRD
Two (2) years Outstanding Performance 2011-2012 – Silver	
1. Ma. Gladys F. Gargollo	FAD
2. Noli P. Alvior	PD
3. Francisco M. Marasigan	PD
4. Rosalinda M. Cruz	TDD
5. Reynaldo L. Dela Cruz Jr.	TDD
6. Ma. Elena G. Gurimbao	TDD
7. Teresita C. Villoso	TDD
8. Louren Joy G. Asmando	ATD

RECIPIENT	DIVISION
One (1) year Outstanding Performance 2012 - Bronze	
1. Jenifer Rose D. Bernaldez	FAD
2. Josefina M. Ramos	FAD
3. Lemuel N. Apuesaga	MPRD
4. Rommel G. Adame	PD
5. Efren A. Andal	PD
6. Augusto S. Atanacio Jr.	PD
7. Ghany M. Bathan	PD
8. Walter V. Bonggat	PD
9. Christian D. Bruel	PD
10. Jenny C. Velasco	PD
11. Camilo C. Cariaga	PD
12. Laureano L. Daley	PD
13. Noel R. Dalul	PD
14. Ely C. Delos Reyes	PD
15. Tirso P. Enteresa	PD
16. Bobby F. Fronda	PD
17. Allan John S. Limson	PD
18. Benjamin C. Logica	PD
19. Virgilio H. Macanip	PD
20. Vincent Boy E. Manabat	PD
21. Ramon M. Martin	PD
22. Simplicio N. Morla Jr.	PD
23. Lina B. Afable	TDD
24. Melchor A. Gamila	TDD
25. Zaida R. Gayahan	TDD
26. Reynaldo M. Loreto Jr.	TDD
27. Marlyn U. Ramones	TDD
28. Jojit M. Velasco	TDD
29. Arlene G. Estacio	ATD
30. Maria Luisa A. Fajarda	ATD
31. Ronilo C. Sanchez	ATD

CIVIL SERVICE MONTH CELEBRATION

In celebration of the 113th Anniversary of the Philippine Civil Service, all personnel gathered on September 30, 2013 at the MIRDC New Auditorium to pay homage to MIRDC's former Executive Director, Arthur Lucas D. Cruz. It aimed not only to recognize his commitment and service but also to inspire officials and employees to unselfishly engage in delivering the best for the attainment of the Center's goals for the benefit of the clients and of the country.

RECIPIENT		DIVISION
MIRDC DIVISION MODEL EMPLOYEES OF THE YEAR		
Level II	Joey G. Pangilinan	MPRD
	Jenny C. Velasco	PD
	Restituto R. Gabaya	PMD
	Rommel N. Concha	ATD
	Marcela R. Cagalingan	FAD
	Agnes I. Josef	TDD
Level I	Celso L. Aguisanda	MPRD
	Francisco M.Manzsigan	PD
	Gil R. Roa	PMD
	Lilo I. Dimaculangan	ATD
	Evelyn P. Inventor	FAD
	Reynaldo M. Loreto Jr.	TDD
MIRDC MODEL EMPLOYEE OF THE YEAR		
Level II	Marcela R. Cagalingan	FAD
Level I	Reynaldo M. Loreto Jr.	TDD
MIRDC BEST DIVISION		
MPRD		

RECOGNITION DAY

In celebration of the Yuletide season, the MIRDC held its annual Christmas program entitled "Recognition Day" on December 18, 2013 at the MIRDC New Auditorium. Unlike the previous years, this year's celebration was made simple but meaningful to express MIRDC's sympathy for our brothers and sisters in the Visayas Region who fell victims to the disastrous typhoon Yolanda. Highlights of the events were the presentation of Loyalty Award, Division Model Employee and Model Employee of the Year and other special awards. There were also parlor games and raffles to add excitement to the occasion.

TRIBUTES

Practically half of their lives were spent in service for the government. To show appreciation to their years of commitment and dedication, accolade was granted to retirees in simple celebrations.

JOSEFINO M. RAMOS
for his twenty-four (24) years in service, given on March 19, 2013 at the FAD Multipurpose Room.

SEGUNDINA S. MERCADO
for her thirty-six (36) years of service, given on July 3, 2013 at the FAD Multipurpose Room and on July 8, 2013 at the MIRDC New Auditorium.

TERESITA C. OCAMPO
for her thirty-nine (39) years of service, given on November 19, 2013 at the MIRDC Old Auditorium.

DANILO A. CRUZ
for his forty-two years of service, given on December 20, 2013 at the MIRDC Old Auditorium.

DEVELOPING HUMAN CAPITAL

The MIRDC strengthens its greatest and most valuable assets by tirelessly providing capability upgrading programs to enhance employees' knowledge and skills to contribute to an even more competitive workforce.

Through its AGSS-FAD, a total of 130 local and 15 foreign programs have been implemented in 2013. Further, various local scholarships grants like the DOST Human Resource Development Program (DOST-HRDP), Science Education Institute Engineering Research and Development for Technology Program (SEI-ERDTP), Science Education Institute Accelerated S&T Human Resource Development Program (SEI-ASTHRDP) and Development Academy of the Philippines (DAP) were awarded to employees to accelerate the production of high level human resources.

This year's MIRDC's new scholars are:

NAME	DIVISION	DEGREE	GRANTOR
1. Florante A. Catalan	ATD	Master of Science in Mechanical Engineering, Mapua Institute of Technology	DOST-HRDP
2. Joel B. Bañares	ATD	Master of Arts in Development Management, DAP, Tagaytay	National Government Career Executive Service Development Program-Public Management Development Program (NGCESDP-PMDP)
3. Concesa T. Cortez	TDD	Doctor in Public Administration, PUP, Manila	DOST-HRDP

financial resources

For any organization to function effectively, it is essential that its resources be managed with utmost care. The Finance and Administrative Division elaborates in this report how it handled one of the most important resources of the organization.

Through the collective efforts of the personnel of the Financial Management Section, composed of the Accounting and Budget Units, as well as all the employees of the Center, resources were properly utilized and were put to effective use for the year 2013.

To wit, the Notice of Cash Allocation received is shown in table 1. And, to illustrate the facts mentioned further, see figure 1.

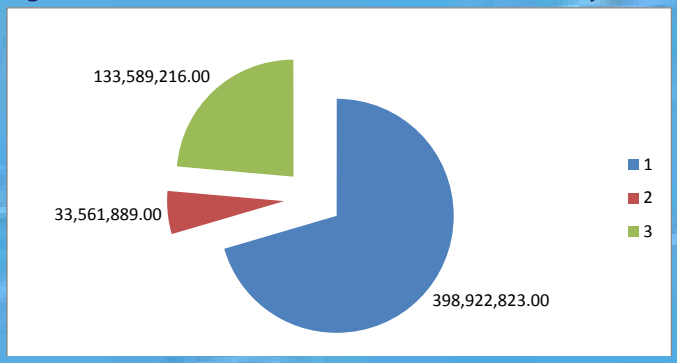
The stated figure for the Trust Liabilities (NCA) amounting to P 133,589,216.00 represents the fund transferred by other government agencies given in trust, for the purpose of the mobilization of various projects handled and implemented by the Center. (see page 62)

Aside from the mentioned funds, given in trust and provided as subsidy, the Center has the following allotments, obligations and balances. From the CY 2013, the MIRDC received a total allotment of P697,526,250.07 and incurred obligations of P573,905,638.99, leaving an unexpended balance of P123,620,611.08. This is inclusive of P 19,855,538.07 2012 continuing appropriations. Breakdown is shown in table 2.

Table 1.

Regular Allotment	398,922,823.00
Accounts Payable	33,561,889.00
Trust Liabilities	133,589,216.00
Total	P566,073,928.00

Figure 1. Notice of Cash Collection received for the year 2013



To Illustrate the totality of the allotments made in 2013, see figure 2.

To further illustrate the obligations incurred by the Center, see figure 3.

Table 2.

Particulars	Personal Services	Maintenance and Other Operating Expenses	Capital Outlay
Allotments	160,502,378.00	343,722,110.66	193,301,760.74
Obligations	160,501,839.49	242,304,067.16	171,099,732.34
Balance	539.18	101,418,043.50	22,202,028.40

Figure 2. Allotments made in 2013

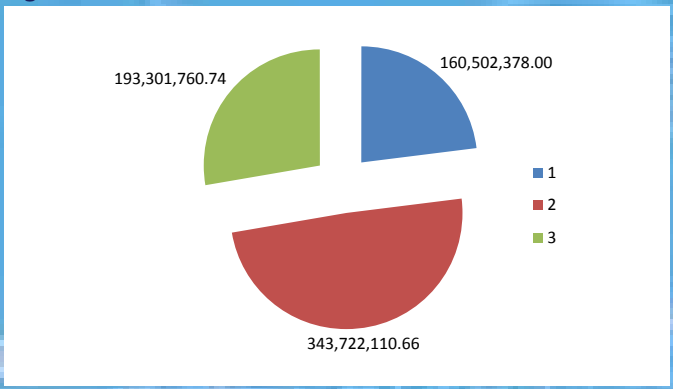
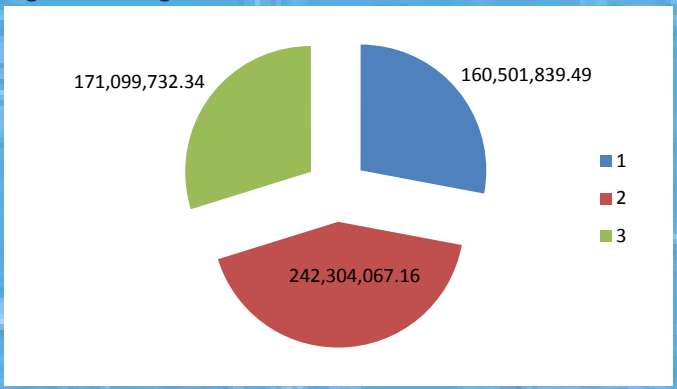


Figure 3. Obligation made in 2013



TRUST LIABILITY - GRANTS- IN - AID (GIA) PROJECTS

PARTICULARS	AMOUNT
To cover trust receipts representing financial assistance for the implementation of Grants-in-Aid (GIA) projects :	
Technical Study for Value Adding of Philippine Iron Resources	920,000.00
Development of a Low Cost and Locally Designed Meteorological Buoy	1,783,267.15
MSMEs	947,800.00
Human Resource Intervention for the Sustainable Growth, Productivity and Competitiveness of the Metals and Engineering Sector: Development and Implementation Of Appropriate Training. Curriculum Design for CNC Machine Tool Programming and Operations	58,918,828.18
Automated Guide-Way System – UP	8,174,877.84
Steer Magalang: Improving the efficiency of the Sugarcane Crusher/ Extractor	154,000.00
Formulation of Roadmap for the competitiveness of the M&E industry	754,412.03
Phase II- Capability Upgrading of Micro Small and Medium Enterprises in the Metals & Allied Engineering Sector Through Technical & Mgt. Trainings- DOST-NCR	173,339.94
Support to the Establishment & Implementation of the QMS for the M&E Sectors Beneficiary Firms	625,047.37
Identification & Selection of Equipment Fabricators in Support to Various DOST Programs	1,159,728.55
Development of a Micro Cupola for Foundry Research, Instruction and Small Novelty Item Casting Production	84,743.50
Capacity Building for Competitiveness of the Metals and Engineering Industry Cluster (CAIMTEC) of CAR	8,847,146.74
Design and Development of Process Equipment for Food Processing Firms	2,971,159.04
Development of Vacuum Oil Quench Heat Treatment Furnace	15,303,486.28
Development & Transfer of Appropriate Technology for Countryside Development	22,858.75
Capability Upgrading for Micro Small and Medium Enterprises in the Metals and Allied Engineering Sector through Technical & Mgt. Trainings- DOST NCR	14,940.33
Project 4: Design & Fabrication of Equipment for the Prod'n of Local Cacao Products	2,438,871.00
Technoville Skills Upgrading Program: Upgrading the Welding Skills of Selected Residents of Bgy. Tanza, Navotas	229,000.00
Strengthening the Project Management and Engineering Design Services Office at DOST	5,050,000.00
Training on Curriculum Design for DOST-RDI Trainers	241,000.00
Development of Handtractor Attachments to Harvester and Transplanter	2,042,136.00
Design and Development of Superheated Steam Treatment System for Stabilized Brown Rice	1,780,838.00
Development of Fluidized Bed Dryer for Production of Stabilized Brown Rice	1,316,142.00
Retrofitting of a Compact Rice Mill for Brown Rice Production	2,089,830.00
Roll-out of DOST-Developed Food Processing Equipment to the Regions	15,289,000.00
TOTAL	131,241,952.51

Amount covering Customer's Refunds and Other Trust Receipts	2,347,263.00
	133,589,215.51

The following graphs illustrate how the Center utilized the allotments it received for the year 2013:

Figure 4. Allotments vs. Obligation - PERSONAL SERVICES

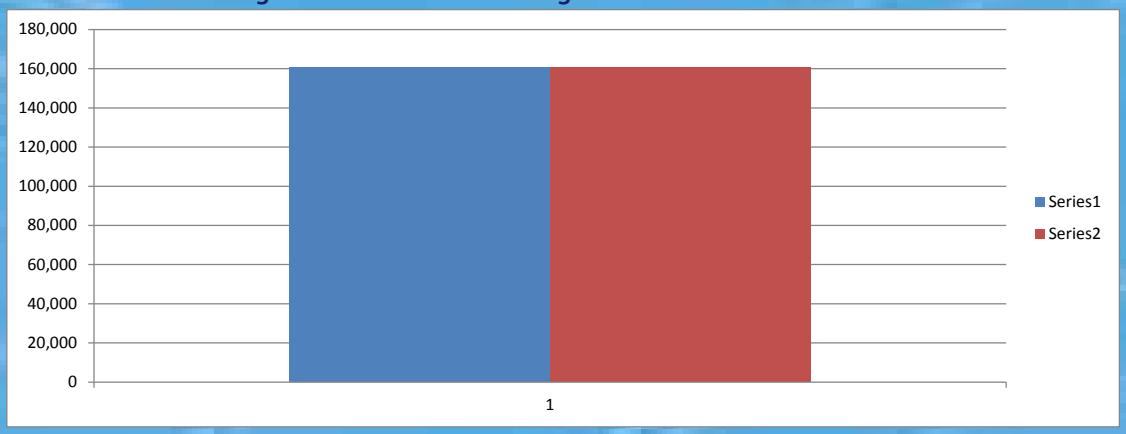


Figure 5. Allotments vs. Obligations - MAINTENANCE AND OTHER OPERATING EXPENSES

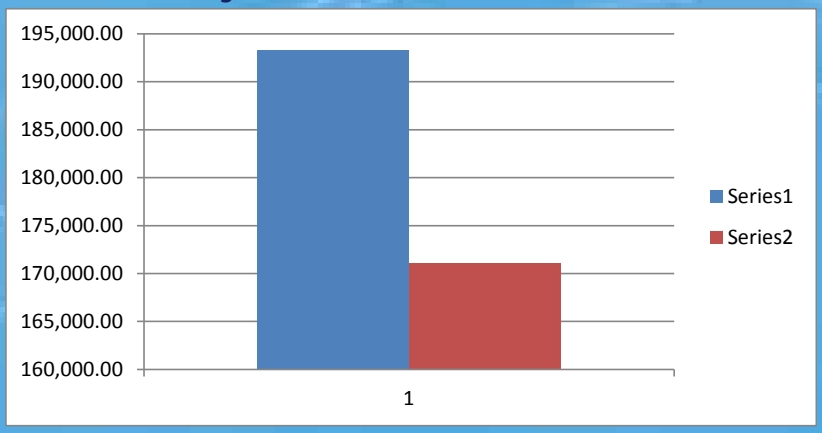
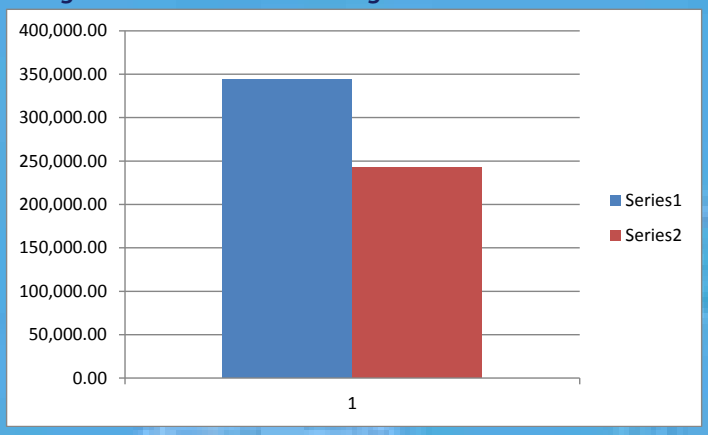


Figure 6. Allotments vs. Obligations - CAPITAL OUTLAY



The Center makes it a point to adhere to its values of Dynamism and eMpowerment, through the collective efforts of its employees who make the most out of their everyday jobs by infusing vigor and enthusiasm. The MIRDC's milestones are derived from the collective successes of individual efforts and capabilities. 90.07% of the Center's generated income of P 39,187,000.00 for the year 2013 was gained from the delivery of its research and development and scientific and technological services. The rest came from rental of its facilities, interest and other miscellaneous income.

The Center continues its virtue of Integrity by encouraging transparency in its reporting, as well as acting responsibly, and exercising justness and fairness in the process. Through all the facts presented, and with the continuous support of the government, the Center is clearly on its way towards the achievement of its goals.

Management Staff

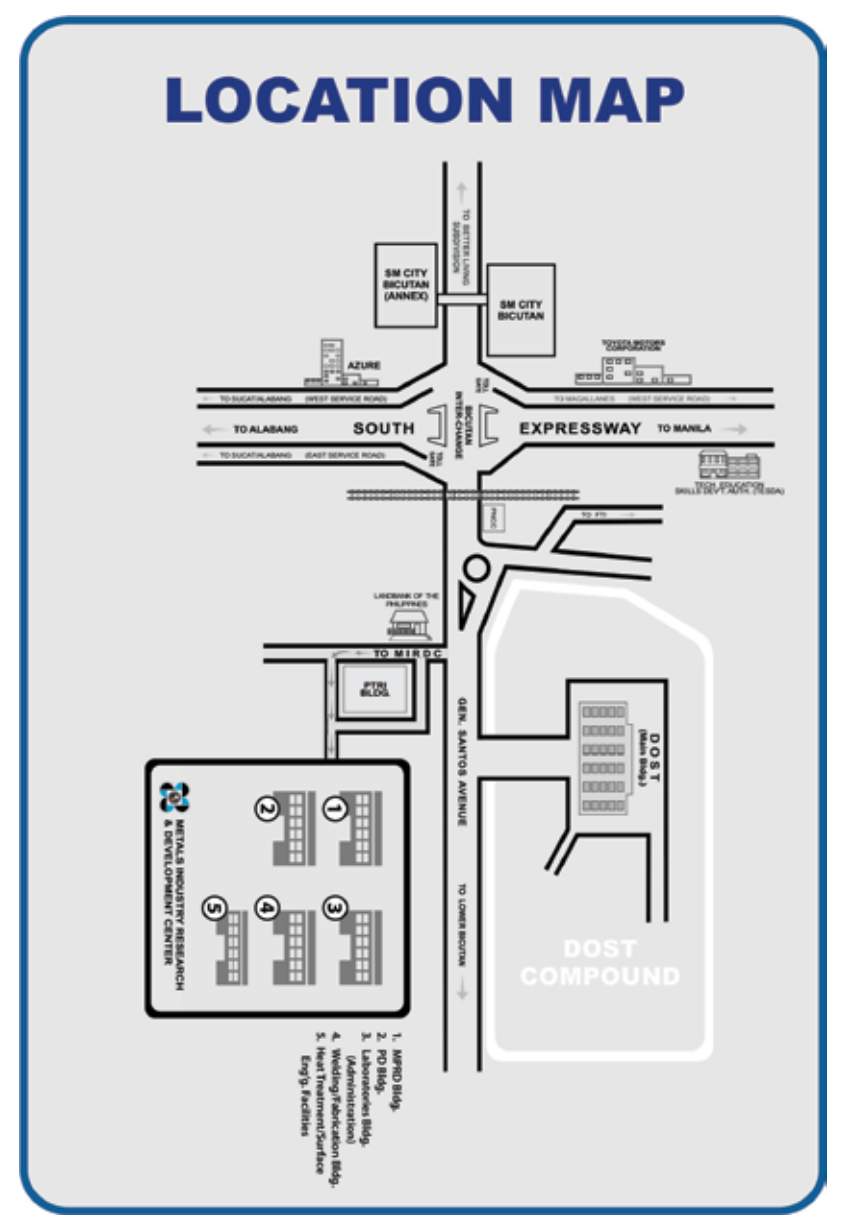
Left to right: **Ms. Blesilda P. Cabaña** (OIC, FAD: January-June 2013), **Dr. Rio S. Pagtalunan** (Chief, Analysis and Testing Division), **Ms. Mercedita G. Abutal** (Chief, Planning and Management Division), **Engr. Jonathan Q. Puerto** (Deputy Executive Director for Reasearch and Development), **Engr. ROBERT O. DIZON** (OIC, MIRDC), **Dr. Agustin M. Fudolig** (Deputy Executive Director for Technical Services), **Dr. Danilo N. Pilar** (Chief, Technology Diffusion Division), **Ms. Jelly N. Ortiz** (OIC, FAD: July-December 2013), **Engr. Rodnel O. Tamayo** (OIC-Materials Process Research Division), **Engr. Fred P. Liza** (OIC-Prototyping Division).


DOST

Governing Council

MARIO G. MONTEJO
DOST Secretary

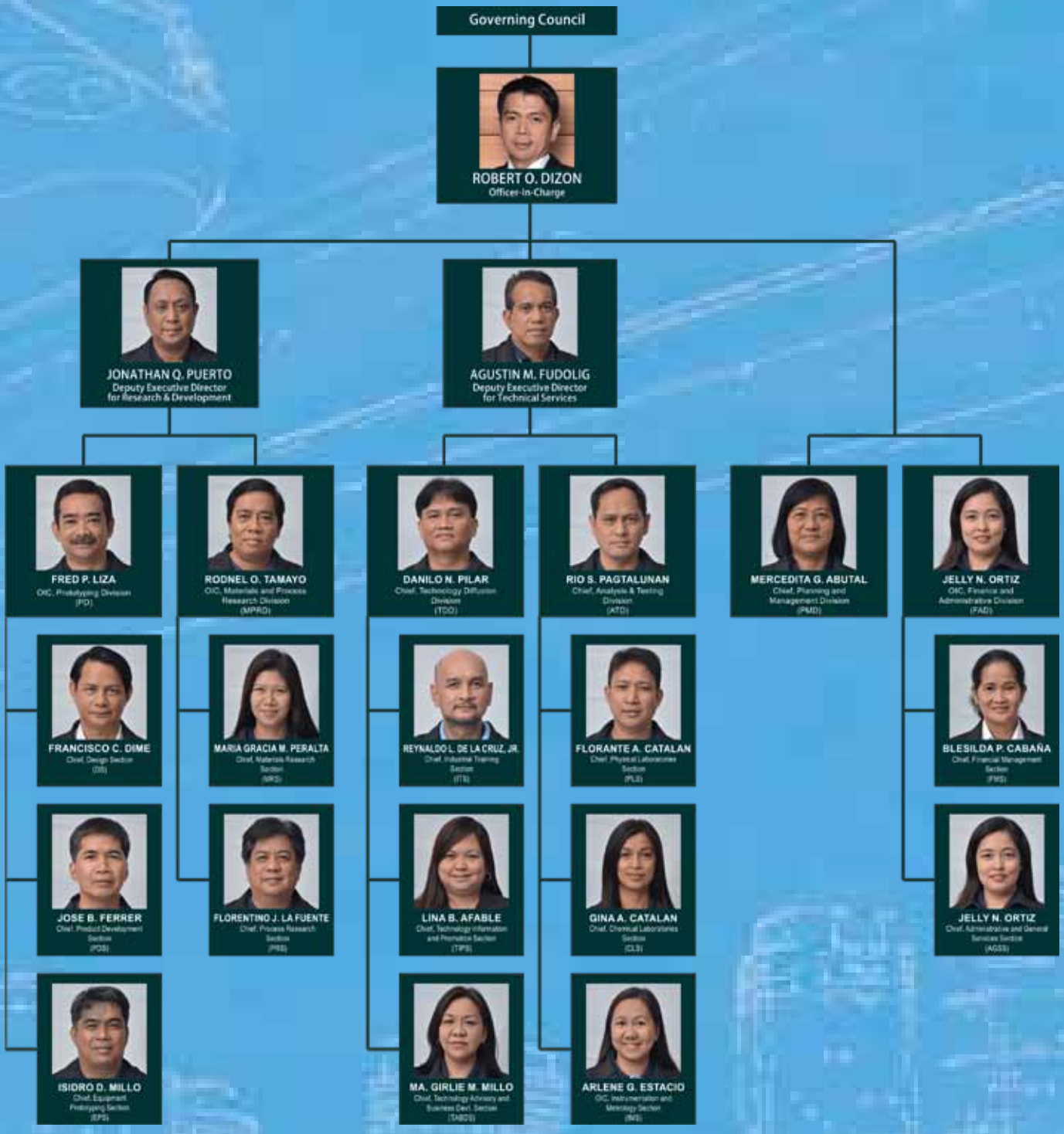
location map and extension offices



REGION VI
DOST Regional Office No. 6
Magsaysay Village, La Paz, Iloilo City
Tel. No.: (033) 320-0908
Fax No.: (032) 320-0908
Contact Person: Engr. Felipe G. Pachoco

REGION X
DOST Regional Office No. 10
J. R. Borja Memorial Hospital Compound
Carmen, Cagayan de Oro City 9000
P.O. Box 150
Tel. No.: (088) 858-3931 (Admin)
(088) 858-3932 (Director's Office)
(088) 858-3933 (Technical)
Contact Person: Engr. Roy C. Sagrado

mirdc organizational structure



mirdc hymn

Kaya Ko, Kaya Mo, Kaya Nating Lahat

Tungkulin mo't tungkulin ko
Paglingkuran lahat kayo
Buong husay, buong ingat
Sa lahat ng oras
Gamit ang Agham at Teknolohiya
Patuloy na manaliksik pa
Handog twina, bagong kaalaman
Industriyang metal mapayaman
Kung kaya ko, ay kaya mo
At kaya nating lahat
Lahat ng bagay na mabigat
Kung sama-sama'y mababuhat
Ang pag-unlad matutupad
Kung matapat ang gaganap
Ikaw, ako, tayong lahat
Isusulong ang bukas

Koro 1
Kaya ko, kaya mo, kaya nating lahat
Industriya ay tutulungan, pribado o gobyerno man
MIRDC ang Sentro na magbubuklod nito
Ang tagumpay makakamit kung sama-sama tayo
Instrumental
Tungkulin ay gagampanan, kakayahan ilalaan
Tayo ay maglilingkod nang buong katapatan
Gagawin nang mabilis, lahat sa tamang paraan
At ating mararating tagumpay na inaasam
(Ulitin ang Koro 1)
Koro 2 (a capella)
Kaya ko, kaya mo, kaya nating lahat
Ating baya'y tutulungan, marating ang pag-unlad
Tayo ay magtulungan upang ating marating
Ang pag-unlad kung sama-sama'y kaya natin
(Ulitin ang Koro 1 at instrumental)
Kaya ko, kaya mo, kaya nating lahat

editorial board

*** On board the AGT: Lina B. Afable, Maria Gracia M. Peralta, and Emerilyn A. Lava**

DEPARTMENT OF SCIENCE AND TECHNOLOGY
METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER

MIRDC Compound, Gen. Santos Avenue
Bicutan, Taguig City, 1631 Metro Manila
P.O. Box 2449 Makati, 1229 Metro Manila, Philippines
Telephone Nos.: (632) 837-0431 to 38 (connecting all departments)
Fax Nos.: (632) 837-0613 and 837-0430
Website: http://www.mirdc.dost.gov.ph
E-mail: mirdc@dost.gov.ph