

Technology Transfer to Industries

During the period from November 2016 to February 2017, BARC has transferred nine technologies to various industries, four AKARUTI Tech pack signed and established DAE Technologies Dissemination & Display Facilities (DTDDF) in two states. Technology Transfer & Collaboration Division, (TT&CD) co-ordinated these activities. The details are given below:

A. “Capacitor Charging Power Supply” technology developed by Technical Physics Division was transferred to ECIL, Hyderabad. It can be used with Triode Sputter Ion Pumps with pumping speeds up to 140 lps and for Thin film deposition by DC magnetron sputtering.

The compact switched mode triode sputter ion pump power supply made in BARC is based on a half bridge dc to dc converter operating at 20kHz resulting in a drastic size reduction of around 75% over conventional power supplies. Our compact SMPS triode sputter ion pump power supply is rated for an open circuit voltage in the range of 6-7kV with a short circuit current rating of 200mA.

B. “Laser Vibrometer” technology developed by Laser & Plasma Technology Division was transferred to M/s Theta Controls, Pune on Nov 23, 2016. The high-resolution, non-contact optical triangulation based instrument, *Kampan* measures vibration in the frequency range 0.1 Hz - 1 kHz with accuracy of 1% and amplitude range in the 2 μ m - 5 mm with a micron resolution. from a stand-off distance of 200 mm In contact dependent techniques, the sensor is kept in touch with the vibrating object which may load the object and cause error in measurements.

C. “On-line domestic water purifier based on ultrafiltration polysulfone membrane” technology developed by Membrane Development Section, Chemical Engineering Group, BARC was transferred to M/s Laxmi Engineering Works, Mumbai, on December 5th 2016.

The purifier eliminates microorganisms, colour, odour, suspended solids and organics from tap water. It is effective in removing bacteria to the extent of 99.99%. The purifier does not need electricity and purifiers about 40 liters of water per day at about 5 psig head.

D. Technical Physics Division, BARC developed “Data Acquisition system for Quadrupole Mass Spectrometer (QMS)”. It was transferred to M/s. Theta Controls, Pune on 19.1. 2017. QMS is a versatile analytical instrument for gas analysis, advanced surface science, plasma characterization, etc.

The data acquisition system through 16bit DAC and ADC, supports acquisition in pulse counting mode whereby for pulses in the range -10mv to -4V and width greater than

8ns. This module also can be used as a general purpose data acquisition module.

E. Food Technology Division developed technology of “Biodegradable Films for Food Packaging Applications”. It was transferred to M/s. Veena Industries, Nagpur on February 2, 2017. Packaging constitutes the largest market for plastics, amounting to over 12 million tons per year. Synthetic packaging materials are made of petroleum products which are non-biodegradable and non-renewable. One of the alternatives is the development of packaging material from biopolymers which are biodegradable, non-toxic and derived from completely renewable resources. The films have mechanical and barrier properties comparable to that of commercially packaging.

F. “Foldable Solar Dryer” and “Vibro-Thermal Disinfestor” technologies developed by Food Technology Division were transferred to M/s Symec Engineers (India) Pvt. Ltd., Navi Mumbai on February 3, 2017. The Solar dryer is a rectangular box with triangular top. The solar radiation is following on the black mat metallic outer surface of the dryer is absorbed by the air inside. Geometry of the solar dryer ensures that the hot air moves up and heats and dries products evenly. The dryer is of modular type and easy to transport.

Vibro-thermal disinfestor is useful for insect disinfestation of food grains, which cause enormous losses in the quality and the quantity of food grains.

G. “140J, 225kV, 6kA Flash X-ray generator” technology developed by Accelerator & Pulse Power Division was transferred to ECIL, Hyderabad on February 9, 2017.

This system based on FPFL Marx generator, is an import substitute. Flash X-Ray radiography is one of the most important methods used to effectively diagnose high speed events. The nanosecond exposure time will effectively prevent motion blur. A small focal spot size gives radiographs. The system can be operated with an output voltage 125kV - 225kV under matched load conditions. It is also useful for radiography of different metallic samples, transient chemical reactions of various materials, sub-microseconds photo chemistry and flash radiography, study of material properties such as iron, cobalt, nickel, zirconium and molybdenum exposed to different radiation doses.

H. “Nisargruna Biogas Technology based on biodegradable waste” was developed by NA&BTD. The plant processes biodegradable waste into biogas and weed free manure. This technology was transferred to the

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following two parties :-

- M/s. S K & Co., Tamilnadu on 05.12.2016
 - M/s. VA Energy Technologies India Pvt. Ltd., Chennai on 13.1.2017
- I. MoU for Setting up DTDDF** was signed with Manipur Science & Technology Council Complex, Manipur on 15.12.2016 and Hemavati Nandan Bahuguna Garhwal University, Srinagar (Garhwal), Uttarakhand on 20.12.2016.
- J. MoUs for AKRUTI Tech-Pack signed with four parties**
- MKCL Knowledge Foundation, Pune
 - Dilip Kasat, Mumbai
 - Seema Gulai & Shri. Amit Gupta, Kutail, Haryana
 - Shri Jagdishprasad Jhabarmal Tibrewala University, Rajasthan
- K. BARC through its Centre for Incubation of Technology has signed the MoU with M/s IDRS Labs Pvt. Ltd., Bangalore for “Development of Radioprotector Drug” on February 23rd, 2017**

BARC Scientist Honoured



Dr. S. M. Yusuf, SO/H+, Solid State Physics Division has been elected a Fellow of the Indian Academy of Sciences in the year 2017. He is also a Fellow of The National Academy of Sciences, India and the Maharashtra Academy of Sciences.