Technology Transfer to Industries

During the period between March 2014 and September 2014, BARC has transferred eight technologies to various industries. Technology Transfer & Collaboration Division (TT&CD) co-ordinated these technology transfers. The details are given below:

A. “Portable Radioisotope Identification (PRID)” technology was transferred to M/s. Nucleonix Systems Pvt. Ltd., Hyderabad (A.P.) on 04.03.2014.

The Portable Radioisotope Identification (PRID) system developed by Electronics Division detects and identifies multiple radionuclides, provides quantified results using field strength analysis and stores the results & spectrum for future reference. It can be operated in various modes as Identifier mode, MCA mode, Transfer stored spectrum mode, Administrator mode and Dosimeter mode. It has ability to identify up to 20 Radionuclide (easily expandable). It has 15 hours continuous operation battery life.

The Portable Radioisotope Identification (PRID) finds applications for ascertaining radioactive contamination mainly for public safety. One of the applications in steel industry is ore and scrap handling.

B. “Preparation of Thin Film Composite (TFC) Charged Nanofiltration (NF) Membranes” technology was transferred to M/s. Osmotech Membranes Pvt. Ltd., Rajkot, Gujarat on 07.03.2014

This technology developed by Desalination Division refers to a novel process for preparation of Thin Film Composite (TFC) Charged Nanofiltration (NF) Membranes containing surface negative charge in the form of fixed sulfonic acid \((-\text{SO}_3\text{H}^+)\) groups. An interesting feature of these membrane is the huge difference between the solute rejections for high rejecting solutes (\(\text{Na}_2\text{SO}_4: 96\%\)) and low rejecting solutes (\(\text{NaCl}: 25\%\)) which enables the membranes fractionally separate them when they are present together in a mixture.

This technology has tremendous potentials for applications in aqueous stream separations such as in production of potable water from partially brackish hard water, removal of heavy metal contaminants, removal of microbial (bacteria/virus) contaminations,

Standing from left are: Dr. T.K Dey, DD, Dr. R.C Bindal, Head, MDS, DD, Sh. Jaman Vagadia, MD, M/s. Osmotech Membranes Pvt. Ltd., Sh. G. Ganesh, Head, TT&CD, Sh. Bhavesh Bhuva, Smt. Preeti K Pal, TT&CD

pretreatment of saline water for desalination processes like RO and MSF, and a host of other areas like pharmaceuticals and bio technological industries, downstream processing, food and beverage industries, dairy industry, waste water treatment.

C.”Nanocomposite Ultrafiltration Membrane Device for Domestic Drinking Water w.r.t. Arsenic, Iron & Microbial Contaminations” Technology was transferred to two parties (1) M/s. Rupali Industries, Mumbai on May 9, 2014 and (2) M/s. SONADKA, Mumbai on June 16, 2014.

Desalination Division (DD) has developed a methodology to produce a domestic water purification device which is made of polysulfone based nanocomposite ultrafiltration membrane in cylindrical configuration. This device can be effective for removal of microbial contaminations and decontamination of arsenic and iron through chemical addition without the need of any electricity and overhead water tank, and hence can be used even in slums and rural areas of the country. The contamination level is reduced below the permissible limits as specified by IS 10500 for drinking water standard.

D.”Mass Multiplication Medium for Biofungicide Trichoderma Spp.” Technology was transferred to M/s Ajay Biotech (I) Ltd., Pune on 20.5.2014

This technology has been developed by NA&BTD. The field applications of Trichoderma spp. require mass multiplication which can be done using solid as well as liquid state fermentation. In the industrialized nations, liquid fermentation is extensively used for multiplication of Trichoderma spp. for commercial formulation. A low cost mass multiplication medium for faster growth of Trichoderma spp. is developed. This material supports better growth of biofungicide compared to existing methods and addition of synthetic sticker is not required while making its formulation. The process is cheaper than the existing methods and is based on the material which is inexpensive and available locally. Hence, in true sense this technology generates wealth from waste.

E.”Process for Retaining Pericarp Colour and Extending Shelf Life of Litchi” technology was transferred to M/s SCRIMAD, Madagascar, on 03.06.2014.

Litchi is a highly perishable commodity which remains fresh only for 2-3 days after harvest. India produces nearly 500,000 tons of litchi second only to China. Because of poor shelf life of litchi it cannot be transported to distant markets in India, also cannot be exported due to shelf life and quarantine barriers. Food Technology Division, BARC has developed a technology based on dip treatment using GRAS (Generally Recognized As Safe) chemicals which extends the shelf life of litchi fruit up to 60 days while maintained at 4°C retaining its appealing pinkish-red color.

M/s SCRIMAD is a Madagascar based international trading company operating since 1998 in the Madagascan litchi industry. It is a member of the Groupement des exportateurs de Litchi de Madagascar (Group of Exporters of Madagascan Lychee), and markets the brand “MADPREMIUM Lychee”. During the transfer of the technology, Dr. Sekhar Basu, Director, BARC, discussed about the prospects and benefits of this technology for litchi
10 days back for taste and he was fully satisfied processing the fresh fruit at FTD, BARC. He was demonstrated to Mr. Simon Rakotondrahova by & Collaboration Division, too were present during FTD, and Shri G Ganesh, Head, Technology Transfer Director, Bioscience Group; Dr. A. K. Sharma, Head, FTD, and processing the fresh fruit at FTD, BARC. He was also given sample fruits which were processed about 10 days back for taste and he was fully satisfied.

F. “Auto TLD Badge Reader” technology was transferred to M/s Intech Dosimeters Pvt. Ltd., New Delhi on 22/08/2014.

PC based automatic TLD badge reader (Auto-TLD BR) has been developed by RP&AD to ensure health and safety of persons working in radiation environment by monitoring the radiation dose received by them (as per the TLD badges worn by them) and maintain a record. The Auto-TLD BR (Model TLDBR 7B) is capable of automatically evaluating 50 TLD badges. It has built-in diagnostic software & safeguards against malfunctioning. This badge reader finds its application in the Personnel Monitoring of radiation workers in Nuclear power stations, Isotope laboratories, Industrial radiography installations, diagnostic & therapeutic radiology centres, etc.

G. “Nitrogen Oxides releasing wound dressing” technology was transferred to M/s Cologenesis Healthcare Pvt. Ltd., Salem (T.N.) on September 15th, 2014.

The technology of “Nitrogen Oxides releasing wound dressing” has been developed by Water and Steam Chemistry Division, BARC Facilities, Kalpakkam under technology incubation MoU with M/s Cologenesis Healthcare Pvt. Ltd., Salem (T.N.). The dressing works on the principle of release of gaseous nitrogen oxides (including nitric oxide) from a collagen matrix containing citric acid and sodium nitrite. The hydrogel based dressing possesses the antimicrobial properties of acidified sodium nitrite and the properties of collagen such as attraction of keratinocytes and fibroblasts to the wound area that encourages angiogenesis and re-epithelialization. The cotton gauze-collagen hydrogel combination is...
cross-linked by glutaraldehyde and dried by freeze-drying. At the time of application, the freeze-dried dressing is wetted by sodium nitrite solution.

The nitrogen oxides releasing wound dressing is useful for treatment of chronic infected wounds and non-healing wounds (diabetic foot, pressure ulcer, venous stasis wound etc). The dressing works by decreasing the infection, increasing the microvasculirization and granulation thereby aiding faster wound healing. The dressing is also suitable for application which requires preparation of wound bed for acceptance of split skin graft based surgery.

H.Biogas Technology based on biodegradable waste has been developed by NA&BTD. The plant processes biodegradable waste into biogas and weed free manure. It was transferred to the following nine parties:-

- M/s Venson Green Solutions Pvt. Ltd., Mysore on 11.4.2014
- M/s. PCP Chemicals Pvt. Ltd., Thane on 8.9.2014