
A Centre Of Excellence In
Nuclear Technology
Harnessing the atoms
for a better future
for all...
UTN
Unit Tenaga Nuklear
Nuclear Energy Unit
MALAYSIA

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for a better future
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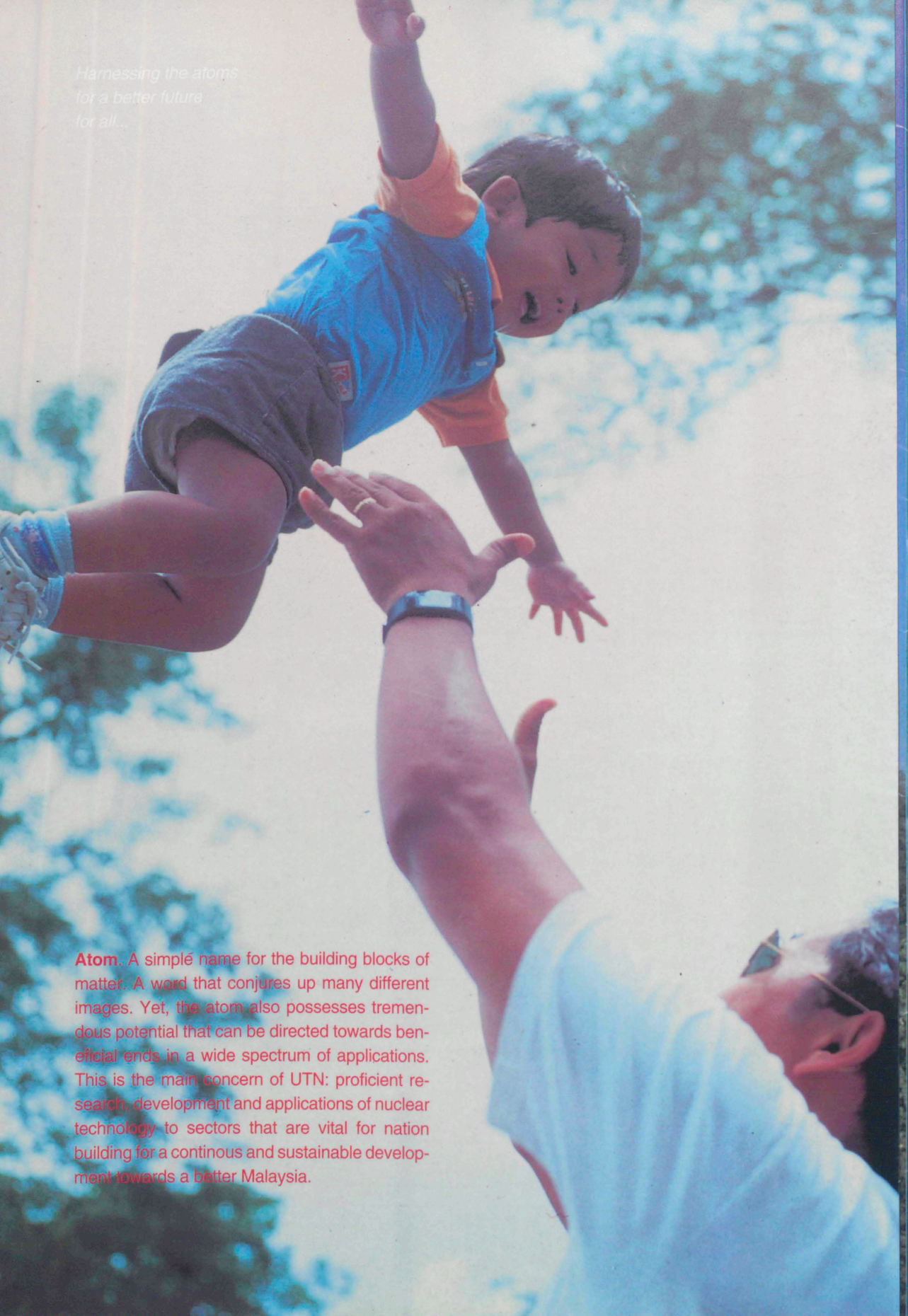


Atom. A simplé name for the building blocks of matter. A word that conjures up many different images. Yet, the atom also possesses tremendous potential that can be directed towards beneficial ends in a wide spectrum of applications. This is the main concern of UTN: proficient research, development and applications of nuclear technology to sectors that are vital for nation building for a continous and sustainable development towards a better Malaysia.

OUR MISSION STATEMENT

To enhance Malaysia's nation-building prowess through excellence in nuclear technology

THIS IS UTN

The UTN administrative and laboratory buildings are located at two sites around Bangi. Lying amidst fresh greenery, both sites afford a serene and conducive working environment.

The 66-acre Bangi site, known affectionately and for historical reasons as Kompleks PUSPATI (Pusat Penyelidikan Atom Tun Ismail), houses the central administrative building and some of the laboratories. Standing on the highest point at the same site is Reaktor TRIGA PUSPATI (RTP), the first Malaysian nuclear research reactor.

The 200-acre Kompleks Dengkil site was acquired in 1984. This site is home to UTN's more recent laboratories, research facilities, and agricultural experimental plot.

THE MANAGEMENT TEAM

Director General
Dr. Ahmad Sobri Hj. Hashim

Deputy Director General
Dr. Nahrul Khair Alang Md. Rashid

Division Directors

Research	*Dr. Abdul Ghaffar Ramli (Acting)*
Operations	*Tuan Haji Razali Hamzah*
Support Services and Co-ordination	*Puan Noor Asmara Mohd. Noor*

Head, Planning Unit
Encik Adnan Haji Khalid

OUR PROFILE

UTN is a research and development institute with activities spanning diverse areas of research converging to a common denominator - nuclear technology.

This diversity affords UTN a panoramic view of various sectors' interplay and interdependency that is useful for positioning itself to optimize its contribution in line with the need of Malaysia.

UTN is backed by excellent research laboratories, facilities, and staff. To date, seven of the twenty-three commercially viable research findings marketed by MTDC (Malaysian Technology Development Corporation) resulted from UTN's reseach and development efforts.

The major research facilities and other services available at UTN are also accessible through its Customer Service Unit (UPP).

Being a partner in international and bilateral collaborative research program, UTN facilitates inflow of technology and reflects Malaysia's capacity for technology absorption. As a result, the technology mix of Malaysia is gradually enriched to include nuclear as a real player in the generation of new products and processes as well as improvement of existing ones.

REDEFINING PLANT ENGINEERING STANDARDS...

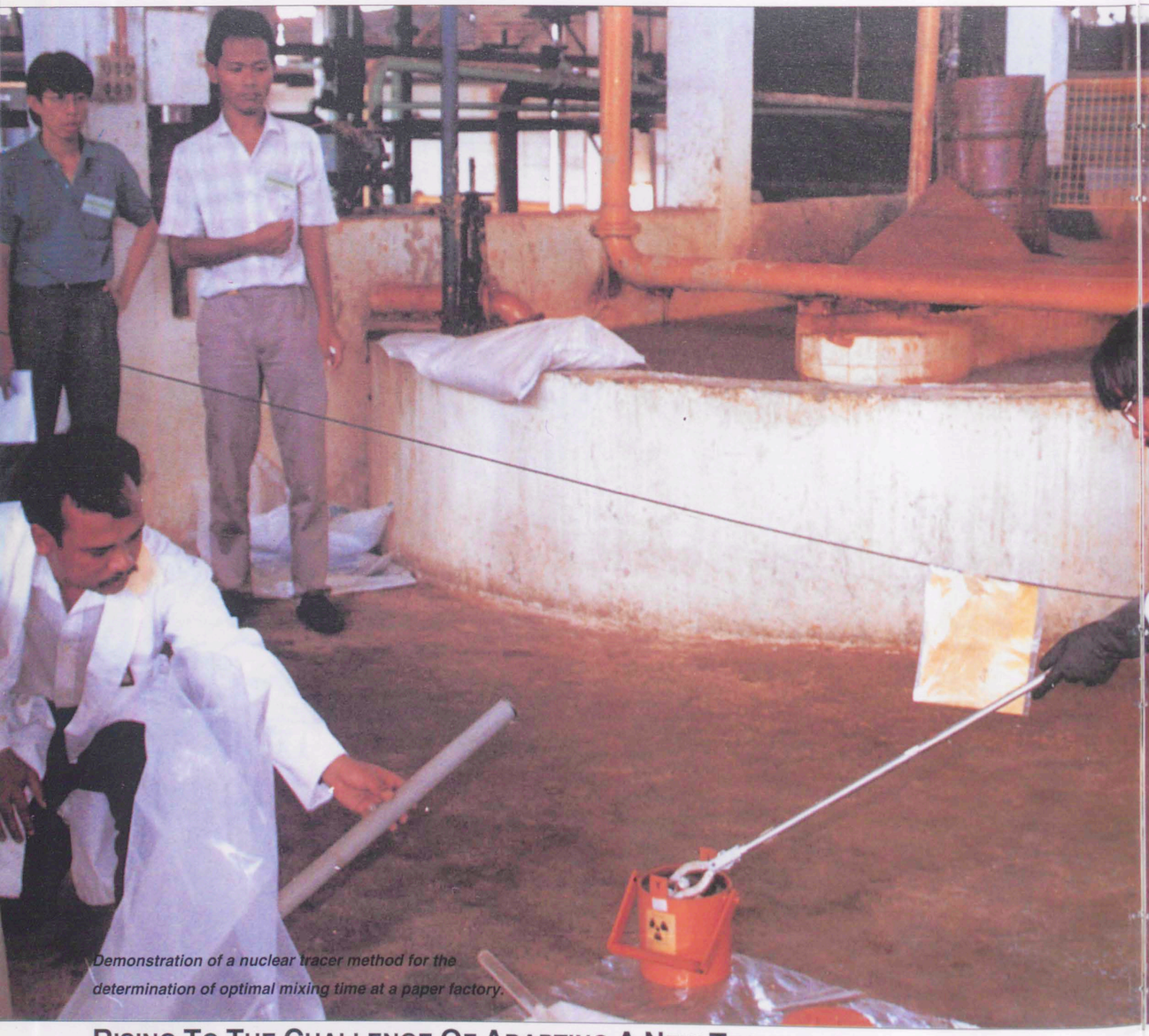
PLANT ENGINEERING QUALITY ASSURANCE

Industrial plant fabrication and operation in Malaysia began with the standards set by the advent of the rubber industry and then improved with the introduction of the oil-palm industry. Recently, the oil and gas industry has begun to dictate higher standards of safety and plant quality assurance. To assist these requirements, UTN developed the non-destructive evaluation (NDE) techniques and created competent local workers through national certification schemes – fulfilling the ever growing demand for highly skilled manpower to perform such specialized techniques required by a dynamic and growing Malaysia.

Trouble-shooting at an oil refinery

Consultation work with the local industry

Conducting multi-leveled, nationally certified courses in NDE viz. Radiography, ultrasonics, eddy-current, magnetic particle and liquid penetrant



Demonstration of a nuclear tracer method for the determination of optimal mixing time at a paper factory.

RISING TO THE CHALLENGE OF ADAPTING A NEW TECHNOLOGY...

INDUSTRY

One of the main thrusts of UTN is building indigenous capabilities in nuclear technology, thus creating new avenues for industries to grow. In-house capabilities are transferred to local industries to achieve savings in time, energy, and cost attainable through process optimization by nuclear technique.

Tracing radiotracers in flow studies

Using radiotracers in studying the efficiency of industrial Incinerators

Use of radiotracer in sediment transport studies at Bintulu Port

The UTN ISO 9002 SINAGAMA plant. From research, process, product, excellence in plant operation, to technology transfer. UTN shows the way, all the way.

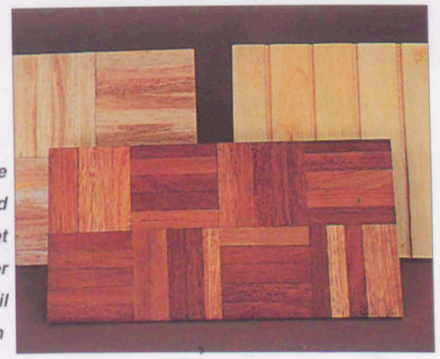
UPGRADING PROCESS AND PRODUCT QUALITY...

RADIATION TECHNOLOGY

Radiation processing is a fast emerging technology in Malaysia. Beginning with SINAGAMA, the UTN 2 MCi gamma irradiator, other similar facility will soon be operated by a local company for sterilization of medical rubber gloves and disposables. This is one UTN success story in technology transfer and a gratifying symbol of the acceptance of nuclear technology. The high quality and value added products, cost-effectiveness, and environment-friendliness of the manufacturing process by radiation technology are easily recognized and adapted by the industry. Research in radiation vulcanized natural rubber latex (RVNRL) by gamma, surface coating and wire and cable cross-linking by electron beam are at the various stages in the footstep of the successful gamma irradiation project.

Radiation-sterilized rubber gloves

RUNRL yields superior quality over conrentional vulcanization method



Surface coated parquet using rubber and palm oil resin

Sterile ready-to-inject radioisotopes and radiopharmaceutical kits produced at UTN

A GROWING POTENTIAL...

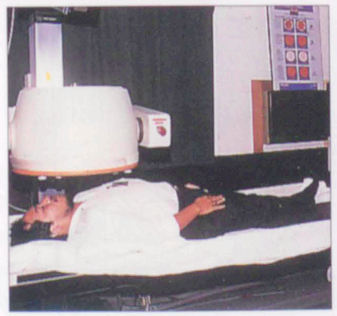
NUCLEAR MEDICINE

Nuclear medicine is gaining recognition as an important sub-speciality of diagnostic medicine in Malaysia. UTN is instrumental to this growing recognition by complementing the radiopharmaceutical needs of this component. In doing so, it has developed facilities meeting the requirements of the Drug Control Authority, Ministry of Health Malaysia, for the production of radiopharmaceuticals. More importantly, this expertise and facilities can easily be adapted to complement R&D needs of local pharmaceutical industry.

Radioisotope production facility or "Hot Cells"

Freeze-drying of pharmaceutical kits in aseptic conditions of a Clean Room

Clinical trial – a UTN volunteer is being injected with UTN's sterile, ready-to-inject, Tc-99m solution



Imaging of thyroid glands

A radiation mutant orchid. Radiation only hastens the natural phenomena of organisms to adapting to the environment by mutation.

ADDING A NEW DIMENSION TO AGRICULTURE...

AGRICULTURE AND BIOTECHNOLOGY

The success of radiation mutant rice *Tongkat Ali* developed by UTN raised excitement that this technique be used to produce superior mutant strains of groundnuts, bananas and horticulture to mention but a few. Studies on the effective management and sustainance of soil fertility by the application of fertilisers are carried out using radiotracers. Athough food irradiation for public retail is forbidden by law in Malaysia, it was found that this technique proved to be ideal for the management of certain post-harvest and meat products. This has a good potential once legislative matters have been sorted out.

From plantlets to products: a time sequential record of the tissue culture of banana plants that has been exposed to radiation

Bouncing of ideas in a discussion on a specific nuclear technique

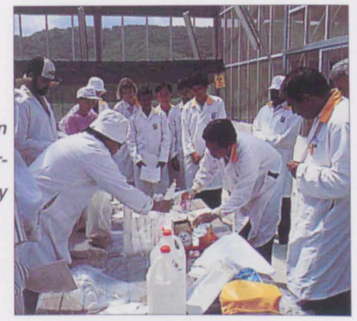
BUILDING THE NATION, TOGETHER ...

TECHNOLOGY TRANSFER

Technology transfer at UTN is a dynamic process. New skills and expertise are acquired, developed and then transferred to the local community when they are proven to positively assist national development. Seminars, training courses, demonstration, consultancy, tutelage, joint projects with other universities and other agencies, public and private, and in-house attachment programmes are all technology transfer mechanisms. UTN is recognised as one of the leading nuclear research institutes in this region and serves as intermediary for scientists coming from less developed countries.

Attachments of students from local institutes of higher learning

Training courses has been an effective method of transferring technology



An international course being conducted at UTN

Due to its superior charecteristics, the padi farmers in Bumbung Lima, Pulau Pinang have been partial to cultivating the Tongkat Ali padi strain – a UTN radiation mutation product

Dissemination of information at a UTN exhibition booth

BALANCING THE VIEW ON NUCLEAR TECHNOLOGY...

PUBLIC AWARENESS

The image of its awesome destructive power seemed to have fused a permanent association between nuclear and everything, except anything favourable. Lately, increasing concern on environment quality world wide, and realization of the role of nuclear technology in clean energy, among others, softens the hard one-sided view somewhat. To further raise general understanding on matters realated to nuclear technology public awareness and education program features regularly in UTN activities. While not denying the risks associated with the technology, its beneficial aspects are acknowledged and highlighted particularly when it presents the only solution or when it is more beneficial over other methods.

Visits to the cobalt-60 facility and RTP

Sharing the knowledge – participants of one of UTN's training course

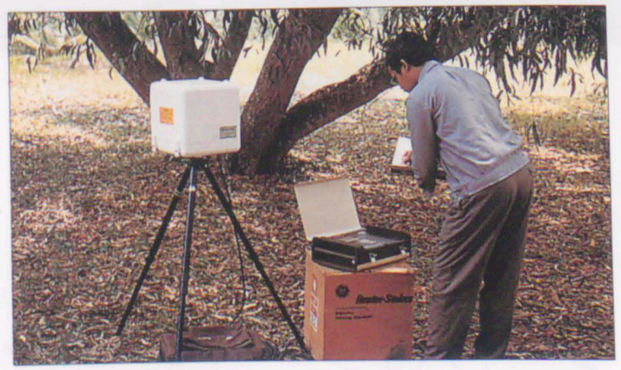
Environmental monitoring – peaceful consistence between technology and environment.

MAINTAINING THE HIGHEST SAFETY STANDARD...

HEALTH AND SAFETY

Effective management and respect for health & safety are essential for the successful introduction and assimilation of any technology. UTN is fully equipped and committed to maintain the highest standards of safety through continuous monitoring of the environment and its personnel as well as others, thus assuring peaceful co-existence between development and the environment.

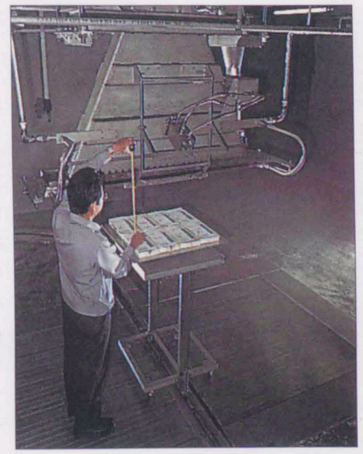
Some of personnel monitoring devices commonly used by radiation workers



UPGRADING THE QUALITY OF LIFE...

ENVIRONMENT

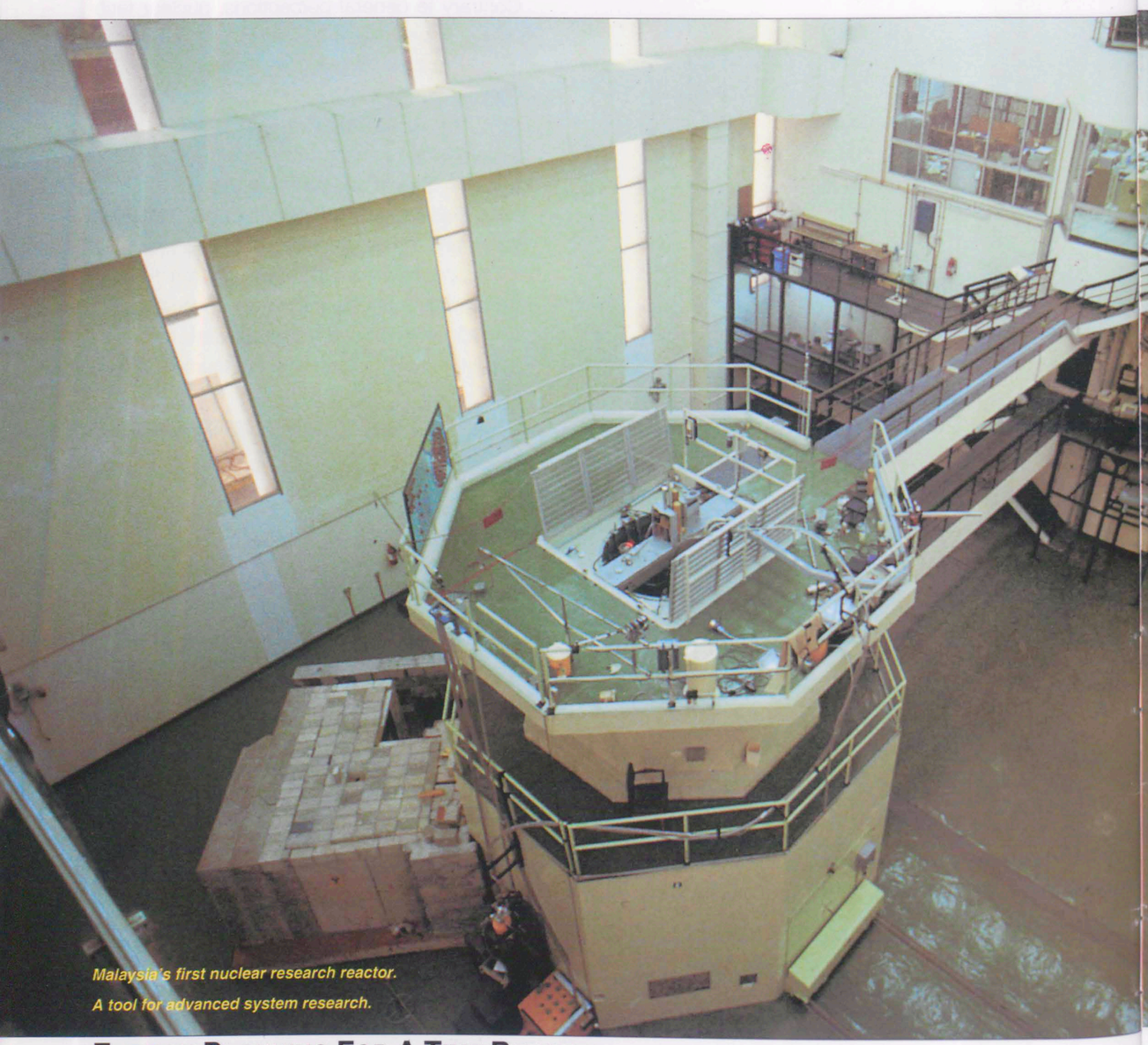
Contrary to general perceptions, nuclear technology is a non-polluting. UTN is doing its part in the care and protection of the environment through the promotion and use of this technology. The movements of pesticides and their eventual fate can be traced using radioactive tracers. Sewer plumes are traced for their mixing and residence transit times. Instead of being and agro-industrial problem, agrecultural by-products are being churned out to be a useful matrix for the cultivation of mushrooms. In hydrology, ground water aquifers are being studied to protect fresh water resources.



The recent commissioning of the 3 MeV Electron Beam machine at UTN provides insight to a similar device potentially capable of treating industrial acidic flue gases or adapted for waste water treatment

Oil palm empty fruit bunch (EFB) are wastes causing environmental problems to the oil palm industry. At UTN, EFB is radiation treated to eliminate futile and sometimes toxic micro-organism, thus making it suitable for cultivation of useful organ-isms e.g. mushrooms

Leakage delection at Kenyir Dam

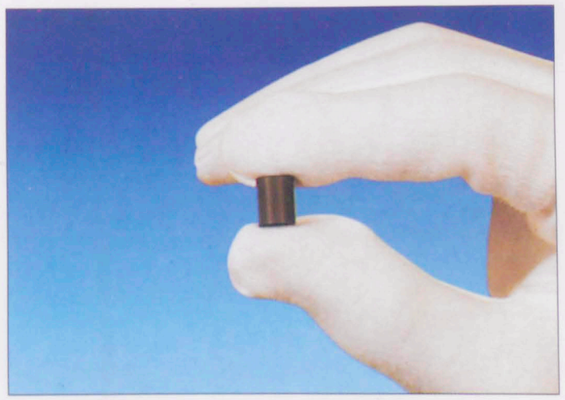


Malaysia's first nuclear research reactor.
A tool for advanced system research.

ENERGY PLANNING FOR A TIME BEYOND...

ENERGY

Nuclear power generation is a passive option in Malaysia's four-fuel policy. Its implementation requires a long lead time, some 10 to 15 years, infrastructures must be in place, adequate man-power must be trained, reactor systems must be understood and evaluated. UTN is continuously studying the nation's electrical power demand vis-a-vis resources available against a backdrop of a fully developed Malaysia. This demanding technology will add new dimensions to plant safety while setting the trend for a more respon-sible work force and work culture. More impor-tantly, it will spur the manufacturing sector to meet the nuclear grade,the highest manufac-turing engineering safety standard and quality. In addition, solar energy research centres around the search for a low-cost solar cell from novel materials.



For further information please contact:

Director General
Nuclear Energy Unit
Kompleks PUSPATI Bangi
43000 Kajang
Selangor Darul Ehsan

For consultancy and other services please contact:

Customer Service Unit
Nuclear Energy Unit
Kompleks PUSPATI Bangi
43000 Kajang
Selangor Darul Ehsan
Tel: (03) 8250510
Fax: (03) 8258262