UNIVERSITI TEKNOLOGI MARA

eScientificNews

JAN-FEB 2021
BIL.17/TAHUN-3

Buletin FSG UiTM Sabah ISSN 2682-7778

KANDUNGAN

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FYP Norma Baharu

Pelajar AS201 mengharungi kerja-kerja FYP dalam norma baharu

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AS201 Final Year Project Feb 2021

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PUSPATI TRIGA Reactor (RTP)

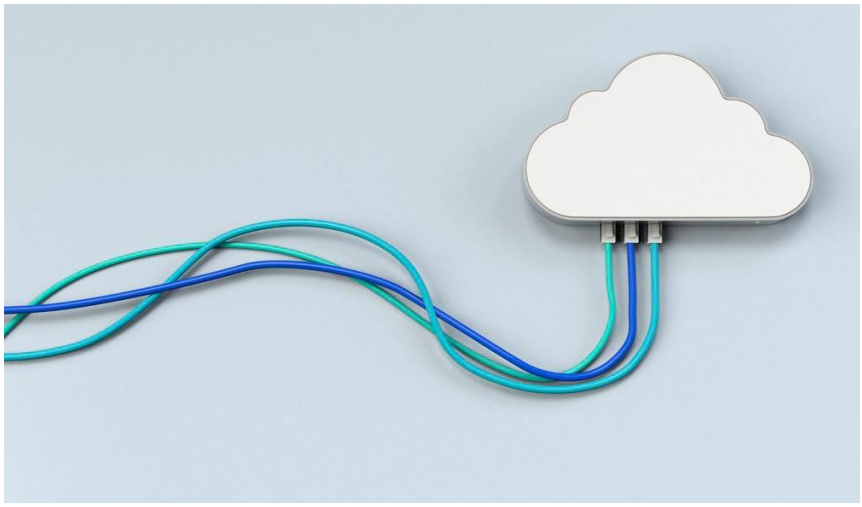
A nuclear reactor with the purpose of nuclear research

FYP Norma Baharu

Oleh Abdul Manap Mahmud

Alhamdulillah, perlaksanaan *Final Year Project (FYP)* Program AS201 UiTM Kampus Kota Kinabalu bagi Semester Oktober - Februari 2021 dapat berjalan dengan baik. Walaupun sepanjang tempoh FYP (Mac 2020 hingga Februari 2021) para pelajar dan penyelia terpaksa berhadapan dengan suasana baharu akibat pandemik COVID-19.

Sebahagian besar pelajar telah dapat menyelesaikan kerja-kerja persampelan di lapangan, melakukan analisis data dan akhirnya telah dapat menghasilkan laporan yang baik. Melalui penelitian kami, kejayaan para pelajar menyiapkan FYP ini ada kaitan dengan dengan perancangan kerja yang baik sepanjang tempoh yang ditetapkan. Disamping itu, para pelajar juga berjaya mengambil kira perubahan-perubahan semasa akibat pandemik COVID-19 pada ketika itu. Disamping itu, kami juga mendapati faktor asasi yang menjadikan sebuah hasil kerja FYP yang baik adalah kefahaman mendalam mereka terhadap konsep-konsep utama dalam kajian masing-masing. Melalui kefahaman yang jelas dan mendalam ini dapat membantu mereka menjalankan kerja-kerja lapangan, menganalisis data dan menghasilkan perbincangan yang baik dan menghasilkan kesimpulan yang berkesan dan bermakna.



AS201 FINAL YEAR PROJECT FEB 2021

By Ajimi Hj Jawan

Neonatal anti-hyperbilirubinemia plant used by Bajau Ubian ethnic at coastal area of Kinarut, Papar, Sabah. (ANISAH ABD FATTAH; Supervisor Abdul Manap Mahmud);

Prevalence and Intensity of Parasites on Mangrove Red Snapper (Lutjanus argentimaculatus). (DG INTAN SYAFIQA, Supervisor Ansir Salim)

The comparative study on the effect of the abiotic factors to the diversity and abundance of gastropods between the protected area and unprotected Mangrove. (ELYONA PRAMELA, Supervisor Ts Dr Patricia Natin);

Acute Toxicity Evaluations of Alphitonia excelsa leaves and barks aqueous extracts. (FATHRINAH BINTI KOHADIE, Supervisor Farnidah Jasnie)

Comparative survey on gastrointestinal parasite of wild and captive elephants. (MAS AZIEZAH; Supervisor Siti Sarayati Abd Mawah)

Comparative survey on gastrointestinal parasite between wild and domestic cattle. (NURUL SYAHIRAH BINTI ABDUL HAZIS; Supervisor Siti Sarayati Abd Mawah)

Biosorption of heavy metals from synthetic wastewater using plant species, (RACHEL GITUAN JOSEPH; Supervisor Ajimi Jawan

Isolation and characterization of heavy metal (cu, pb) resistant bacteria from abandoned Mamut copper mine. (MOHD TAUFEEQ BIN MASRI; Supervisor Dr Lo Chor Wai)

Anti-inflammatory activities of medicinal plants that used by iranun ethnic in kampung Rampayan Ulu, Kota Belud, Sabah. (ZULAIKHAH AQILAH BINTI BAHARUDDIN; Supervisor Abdul Manap Mahmud)

A review on the heavy metals accumulation and health risk assessment of fish via consumption in Malaysia. (NURFARAZIANNA MADLIN; Supervisor Ajimi Jawan)

In vivo Acute Toxicity Elaluations of Hornstedtia havilandii Aqueous Fruit Extract. (HERLYNN VIVIANE; Supervisor Farnidah Jasnie)

The Effect of Physico-chemical parameters and body size to the prevalence and intensity of ectoparasites on Nile Tilapia Oreochromis niloticus. (NUR ATIQAH BINTI MOHD JAT, Supervisor Ansir Salim)

The Relationship of abiotic factors to the distribution and abundance of beach Morning Glory (Ipomoea pes-caprae) between two beach locations. (NUR FITRYANIE BINTI SAPARI, Supervisor Ts.Dr Patricia Natin)

Atomic Absorption Spectoscopy Analysis of Heavy Metal Accumulating Bacteria Isolated from abandoned Mamut Copper Mine, Ranau Sabah. (PRELLWILLDIEL PETER; Supervisor Dr Lo Chor Wai)

PUSPATI TRIGA Reactor (RTP)

Division of Reactor Technology, Malaysia Nuclear Agency

By Shirley Arvilla Andrew

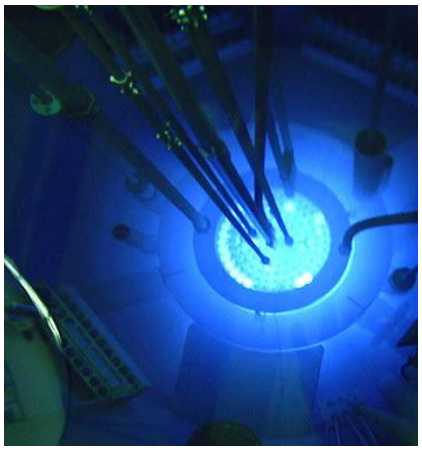


Figure 1: RTP in operation mode

The Reactor TRIGA PUSPATI (RTP) is located in the Division of Reactor Technology, Malaysia Nuclear Agency. This RTP is the only reactor in Malaysia. However, it is a small nuclear reactor with the purpose of nuclear research. It was first operated in early 1982 and reached its first criticality on 28 June 1982. TRIGA stands for Training, Research, Isotope production and General Atomic. RTP is a pool type reactor where the reactor core positioned at the bottom of a 7m high aluminum tank and this is surrounded by a biological shield made of “high density” concrete. The reactor uses solid fuel elements in which the zirconium-hydride moderator is homogeneously combined with enriched uranium. Demineralized water acts both as coolant and neutron moderator while graphite acts as a reflector. The reactor was designed to effectively implement the various fields of basic nuclear science and education. It incorporates facilities for advanced neutron and gamma radiation studies as well as for application including Neutron Activation Analysis (NAA); Delayed Neutron Activation Analysis (DNA); Radioisotope Production for medical, industrial and agricultural purposes; and Neutron Radiography and Small Angle Neutron Scattering (SANS). The RTP is a 1 Mega Watt research reactor. It is a TRIGA MARK II type. Demineralized water inside reactor acts as coolant, moderator and prevent the N-16 (radioactive) to reach the surface. Electronic instrumentation controls the parameters of the reactor and to allows shutdown if operation over the safety limit.

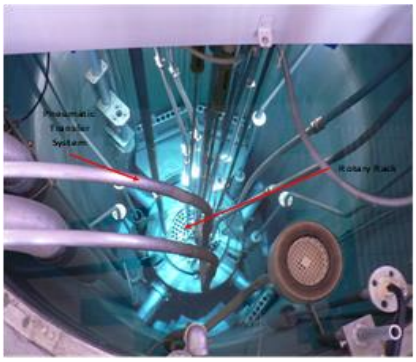


Figure 2 In-core experimental facilities

The RTP operates about 6 hours a day and 4 days a week (Monday to Thursday upon request). Normally, operation of RTP is at power level of 750 kW, which is 75% of the 1 MW (no 750kW power prepared at console however 750 kW is obtained by 75% of the 1 MW, displayed at console). RTP operated with four control rods namely Transient, Safety, Shim and Regulating that will be drawn up from the reactor core. Irradiation facility consists of three part which are in-core, rotary-rack and out-core. In in-core, there are Central Thimble (CT); Pneumatic Transfer System (PTS); Dry Tube (DT); Bare Delayed Neutron Analysis (DNA-Bare); Cadmium (Cd) Covered Delayed Neutron Analysis (DNA-Cd); Isotope Production System (IPS) and experimental holes. Out-core irradiation facility consists of Small Angle Neutron Scattering (SANS); Neutron Radiography (NUR); Thermal Column and “Beam ports”.

Figure 3 The control console and indicators.

Instrumentation and circuitry which operates and controls the reactor are presented in four parts namely the control console; individual control and safety channels; monitoring system and reactor operating modes. An operator controls functions essential to reactor operation from a desk-type control console located near the reactor. Instrumentation on console connected by particular circuits in order to control the drives rod, interlock facility system, and variety of detectors positioned around the reactor core. These detectors and their associated instrumentation channels

cover particular power ranges. Meters, switches and recorder which are used to operate the reactor are mounted on the console control panels. The control and indicating devices located on a typical console. Checklists on the RTP systems are conducted twice a day. Morning checklist (pre-setup) is to make sure all the systems are in good condition for the reactor to operate (all related systems for the reactor operation are switched on). Evening checklist (shut-down), all switched on systems during morning checklist are switched off. These checklists are conducted every day even with no reactor operation in order to maintain the condition of the reactor (to make sure the reactor is in tip-top condition to operate). The reactor is ready to operate within or about 2 hours after the early checklist. Reactor operation takes at least 6 hours a day at the power of 750 kW, therefore, there are no operation on Friday (since long break time). Reactor operates 4 days a week, Monday to Thursday upon request. SCRAM is done at the end of reactor operation. There are four main part of the systems to be checked which are control room; reactor hall; basemen (and RTP Primary Cooling System) and ventilation. Morning checklist also conducting calibration (such as linearity test and SCRAM test) on systems at console (control panel). The filled checklist forms by the technician on duty are then validated by the senior technician or research officer in charge of the reactor.

Figure 4 RTP Platform

References

Instrumentation System: Operation and Maintenance Manual. Prepared for Tun Ismail Atomic Research Centre, Kuala Lumpur, Malaysia. © General Atomic Company 1978. All Rights Reserved. June 1978.

Safety Analysis Report for PUSPATI TRIGA Reactor. Malaysian Nuclear Agency. 2008.

Zarina, M. PUSPATI TRIGA Reactor. Malaysia: Nuclear Power Division, Malaysian Nuclear Agency