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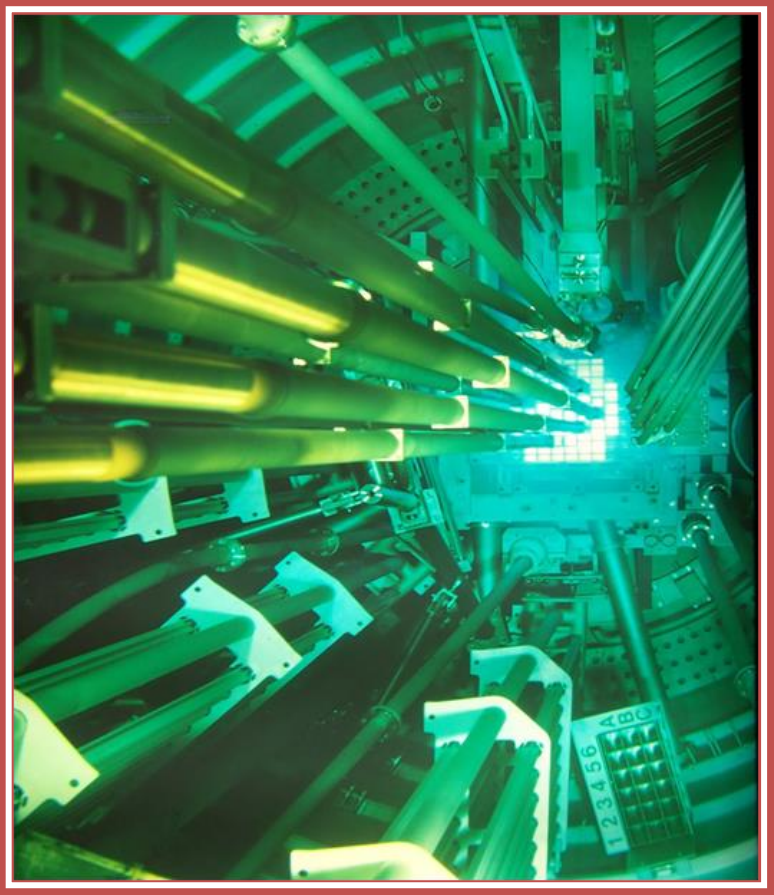

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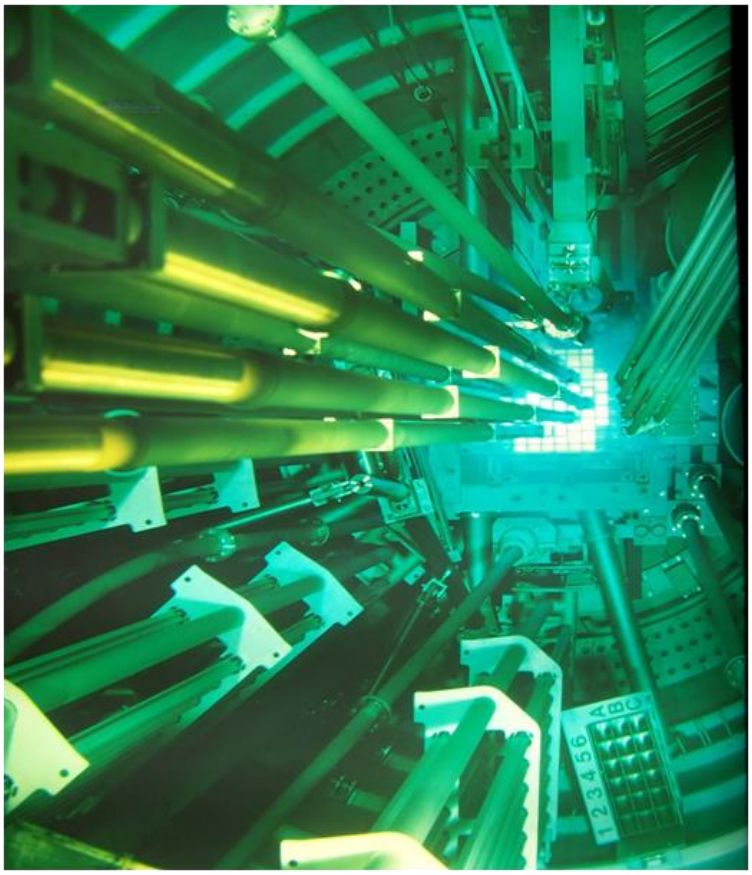

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PREFACE

Dear readers,

With great pleasure we provide you with the first issue of the Jurnal Teknologi Reaktor Nuklir (Journal of Nuclear Reactor Technology) Tri Dasa Mega in 2021 – Vol. 23 No. 1 (February 2021). This issue contains five articles discussing various applications of nuclear technologies and sciences.

The first article "Analysis of Reactivity Insertion as a Function of the RSG-GAS Fuel Burn-up" was written by Tukiran Surbakti, Surian Pinem and Lily Suparlina from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. In research reactor operation the control rod is often pulled up. When the control rod is pulled up, there will be insertion of positive reactivity into the core. This paper analyzes how reactivity insertion as a function of the fuel burn-up at RSG-GAS reactor. It is conducted by calculation using WIMSD-5B and MTR-DYN codes.

The second article "Critical Heat Flux Nanofluids Measurements System Using Arduino" was investigated by Santiko Tri Sulaksono, Sudjatmi Kustituantini Alfa, Dani Gustaman Syarif from Center for Applied Nuclear Science and Technology - BATAN, Bandung. The Critical Heat Flux (CHF) is an important characteristic of nanofluids and also an important parameter in reactor physics phenomena. This article carried out the synthesis and characterization of Al2O3 nanofluids. A CHF measurement system was created that automatically transmits and increases the power of the wire and measures and records the voltage and current on the wire. The measurement system is built using inexpensive and commonly used modules and components. The system is tested by measuring the current and voltage on the wire and compared with the measurements using a multimeter. The measurement of CHF in nanofluid research was done in technophysics laboratories.

The third article "Evaluation of Equilibrium Core Operation of the RSG-GAS Reactor" was studied by Iman Kuntoro, Surian Pinem, Tagor Malem Sembiring, Dwi Haryanto, Sigit Purwanto from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. During the operation of the research reactor RSG-GAS, there are many design parameters should be verified based on measurement. The paper is intended to evaluate its in-core fuel management that is the conformance between the theory and implementation of the equilibrium core. Evaluation of the reactor operation parameter was carried out for the RSG-GAS reactor. The neutronic parameter of excess reactivity, shutdown reactivity, and control rod reactivity was evaluated during operation at each core. They compare experiment with calculation results using BATAN-FUEL code.

The fourth article "Strain Analysis of Reactor Type Core Structures by Considering Uncertainties of Graphite's Properties" was explored by Mike Susmikanti, Roziq Himawan, Jos Budi Sulistyo, Farisy Yogatama Sulistyor from the Center the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. The high-temperature gas-cooled reactor (HTGR) technology uses uranium as the reactor fuel. The energy from fission is converted to electrical energy or used for other needs such as hydrogen production. One of the reactor core structure material is a graphite. They study to develop a method for the design of the reactor core structure with graphite material. The design method developed is based on the finite element method. The object of this research is the side reflector made from the Toyo Tanso IG-110 series graphite. They study heat

distribution and heat stress for the material before the effect of neutron exposure, the temperature distribution on the side reflector, the displacement and heat stress. They analyze the strain of the reactor core structure by taking into account the uncertainty of the graphite properties. The isotropic properties, Young's modulus and Poisson's ratio values were verified and estimated.

The fifth article "Dose Optimization on Liver Cancer Proton Therapy and Boron Neutron Capture Therapy Using Particle and Heavy Ions Transport Code System" was investigated by Hafiz Fahrurrozi, Andang Widi Harto, Isman Mulyadi Triatmoko, Gede Sutrisna Wijaya, Yohannes Sardjono from Department of Nuclear Engineering and Physics Engineering, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta. The paper is presented proton therapy and boron neutron capture therapy (BNCT) as alternatives with a lower dose on healthy organs. The objective of this research is to get a good dose distribution with higher tumor dose and lower healthy organ dose in proton therapy. A comparison with BNCT is done to get a better understanding of how both methods deliver the dose to treat the cancer while minimizing healthy organ doses. The researchers simulated proton therapy for cancer liver with Particle and Heavy Ions Transport Code System (PHITS), and a literature review for BNCT. The both methods were compared by tumor dose and liver dose.

On behalf of the Jurnal Teknologi Reaktor Nuklir (Journal of Nuclear Reactor Technology) Tri Dasa Mega, I would like to thank to all Editors, Reviewers, Managements, Authors, and Readers for your endless supports.

Editor in Chief