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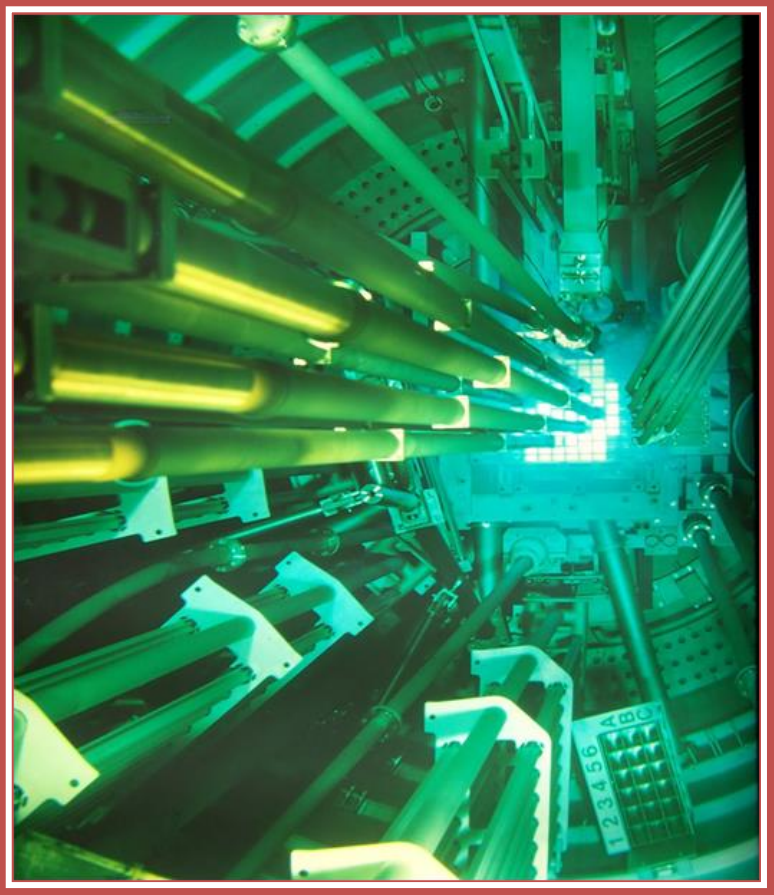

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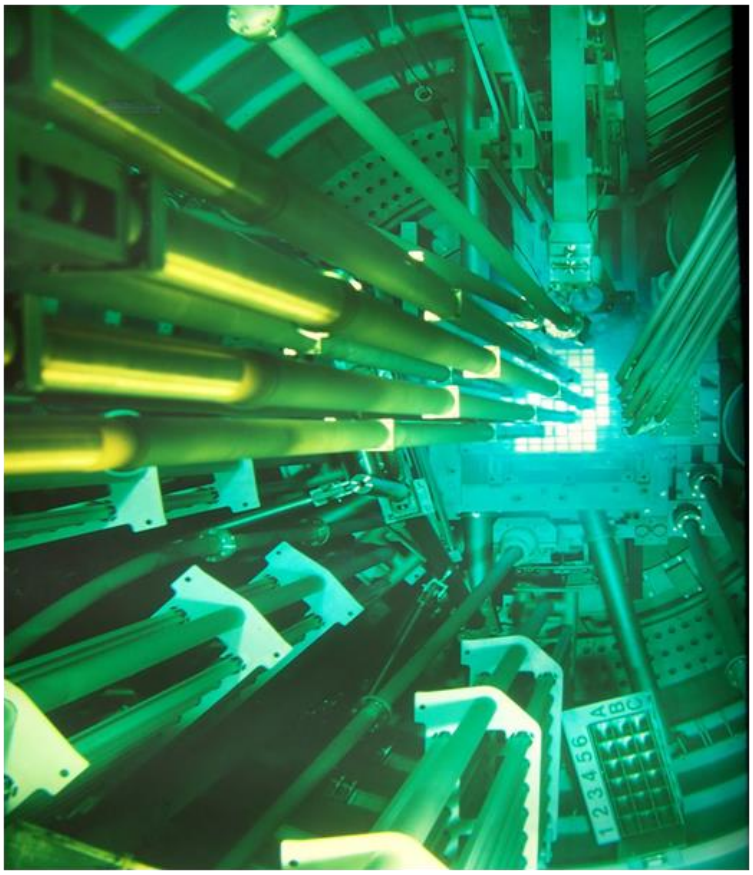

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PREFACE

Dear readers,

With great pleasure, we provide you with the second issue of the Jurnal Teknologi Reaktor Nuklir (Journal of Nuclear Reactor Technology), Tri Dasa Mega, in 2022 – Vol. 24 No. 3 (October 2022). This issue contains five articles discussing various applications of nuclear technologies and sciences.

The first article "Prediction of AP1000's Nuclear Reactor Pressure Vessel Temperature During Normal Operation" was written by Muhammad Darwis Isnaini, Elfrida Saragi, Veronica Indriati Sri Wardani from the Research Center for Nuclear Reactor Technology, National Research Innovation Agency (BRIN), Tangerang Selatan, Banten. This paper presents the calculation result of the RPV temperature prediction during AP1000 normal operation. Calculations were performed using COBRA-EN code for analyzing the core thermal hydraulics and using analytics for predicting the RPV temperature. These methods were carried out with the aim to predict the RPV temperature as well as at steady state nominal power conditions, at the function of flow, and at power fluctuation conditions. Modeling of thermal-hydraulic calculations for the AP1000 core to predict the reactor pressure vessel (RPV) temperature is needed to understand. The reactor's primary coolant system transfers the heat produced in the reactor fuel during reactor operation to the steam generator. Part of the heat will also be transferred from the coolant to the reactor vessel and the pipe. The heat in the cooling system always transfers to the heat pipe.

The second article "Estimation of Neutron and Prompt Photon Dose Rate Distribution in TMSR-500 Using MCNP6" was written by Luqman Satria Pradana, Utari, Suharyana, Azizul Khakim from the Physics Department, Faculty of Mathematics and Natural Sciences, Universitas Sebelas Maret, Surakarta, Central Java, Indonesia. This research is focused on the Thorium Molten Salt Reactor-500 (TMSR-500), one of the Generation IV nuclear reactors, designed by Thorcon International, Pte. Ltd, which is projected to be built in Indonesia. The reactor core is radially surrounded by B4C shielding, but not the upper part. As the silo hall sits above the reactor core and is accessible by reactor personnel, the dose rate must be calculated in the area to ensure the workers receive an annual dose below the acceptable limit. The dose rate from neutrons and photons as the result of fission reactions are the only sources to be calculated in this research, without taking the source from fission products into account. This research aims to obtain the dose rate distribution of neutrons and prompt photons using Monte Carlo code MCNP6.

The third article "Neutronic Analysis of the VVER-1200 Lattice cell fuel using WIMSD-5B Code" was written by Santo Paulus Rajagukguk, Syaiful Bakhri, Ana Muliyana, Juniastel Rajagukguk from the Department of Physics, FMIPA, UNIMED, Medan. They study The calculation of safety parameters in nuclear reactors has an important influence on nuclear reactor control and safety. The infinite multiplication factor, reactivity coefficients, and power peaking factor parameters are the most important safety parameters for determining reactor status. The aim of the present study is to analyze the behavior of the nuclear safety parameters for the VVER-1200 core in a normal state of reactor operation. A lattice cell fuel model of the VVER-1200 reactor core was performed using WIMSD-5B. The cross-section library data based on the ENDF/B-VIII.0 was used. The investigated parameters were the value of infinite multiplication factor with different pitch, temperature, enrichment, and boron concentration. The calculation also investigated the reactivity coefficient parameters. The

verification of the WIMS model VVER-1200 was performed by comparing the results of the WIMSD-5B code with VVER-1200 data in the SAR document.

The fourth article “Microcontroller ATMega328P Timer/Counter for Single Channel Gamma Spectroscopy” was explored by Santiko Tri Sulaksono, Putu Sukmabuana, Nanda Nagara, from the Research Center for Technology Nuclear Reactor, Research Organization for Nuclear Energy, National Research and Innovation Agency, Bandung, West Java. Their research is about The performance of the ATMega328P microcontroller Timer/Counter on Arduino has been tested for single-channel spectroscopy. Microcontroller's Timer/Counter1 is used as a counter while Timer/Counter2 is used as a timer. Tests include the linearity test, comparative test, and chi-square test. The test results show that the ATMega328P microcontroller Timer/Counter works well and can be used as the end of a single-channel spectroscopic system.

The fifth article “Collision Cascade and Primary Radiation Damage in Silicon Carbide: A Molecular Dynamics Study” was investigated by Ihda Husnayani, Muzakkiy Putra Muhammad Akhir, from the Research Center for Technology Nuclear Reactor, Research Organization for Nuclear Energy, National Research and Innovation Agency, South Tangerang, Banten. The paper has presented the assessment of Silicon carbide (SiC) as a competitive candidate material to be used in several advanced and Generation-IV nuclear reactor designs as a neutron moderator, fuel coating, cladding, or core structural material. Many studies have been performed to investigate the durability of SiC in a severe environment in a nuclear reactor. However, the nature and behavior of defects induced by neutron irradiation are still not fully understood. This paper is aimed to study collision cascade and primary radiation damage in SiC using molecular dynamics simulation. The potential being used was a hybrid Tersoff potential modified with Ziegler-Biersack-Littmark (ZBL) screening function. The collision cascade was let evolved for 10 ps from a Si or C primary knocked atom (PKA) located initially at the top center of a system.

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

Editor in Chief