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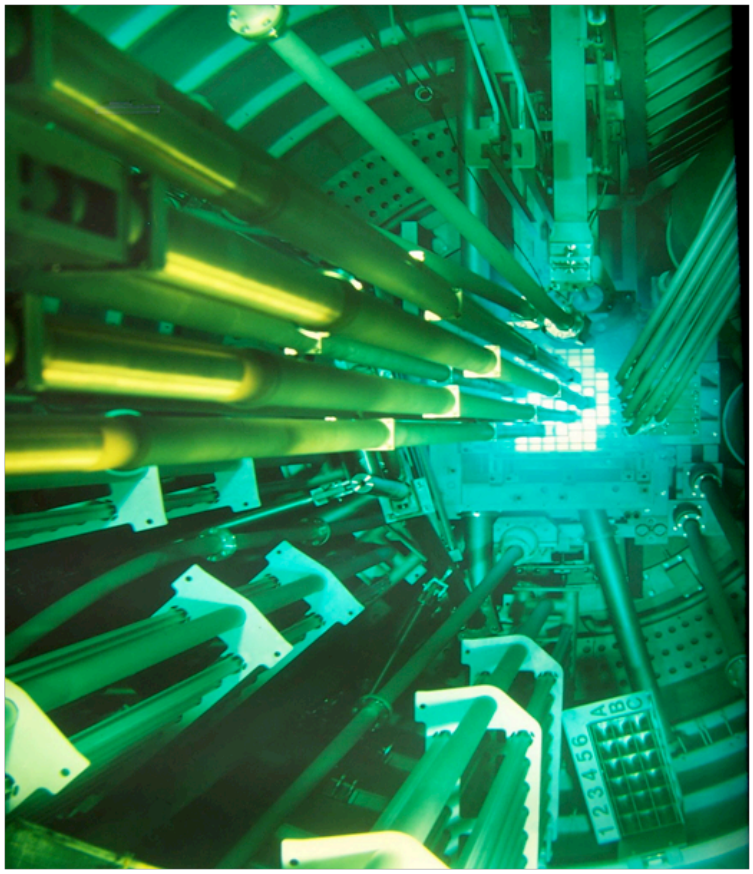

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PREFACE

Dear readers,

With great pleasure we provide you with the third issue of the Jurnal Teknologi Reaktor Nuklir (Journal of Nuclear Reactor Technology) Tri Dasa Mega in 2020 – Vol. 22 No. 3 (October 2020). This issue contains five articles discussing various applications of nuclear technologies and sciences.

"Information Processing in the Reactor Protection Systems of High Temperature Gas-Cooled Reactors" was written by Tulis Jojok Suryono, Sudarno and Sigit Santoso from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. Reactor protection systems transform process variable signals from the sensors into initiation and actuation signals to trip the reactor if the signal's value exceeds the predefined trip setpoints of the Reactor protection systems. This paper investigates how the information is processed in the Reactor Protection Systems of the Experimental Power Reactor based on high temperature reactor technology, and how the information is displayed on the human machine interface of the main control rooms of the Experimental Power Reactor. It is conducted by classifying the Reactor Protection Systems into three layers based on its components and their functions, followed by the investigation of the type and the information processing in each layer.

"Calculation of 2-Dimensional PWR MOX/UO2 Core Benchmark OECD NEA 6048 with SRAC Code" was investigated by Wahid Luthfi and Surian Pinem from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. The mixed uranium-plutonium oxide fuel (MOX/UO2) is an interesting fuel for future power reactors. This is due to the large amount of plutonium that can be processed from spent fuel of nuclear plants or from plutonium weapons. MOX/UO2 fuel is very flexible to be applied in thermal reactors such as PWR and it is more economical than UO2 fuel. However, due to the different nature of neutron interactions of MOX in PWR, it will change the reactor core design parameters and also its safety characteristic. This study determines the accuracy of SRAC2006 code system in generation of cross-sections and calculation of reactor core design parameters such as criticality, reactivity of control rods and radial power distribution.

"Development of Automatic Data Processing for BATAN's HRPD and FCD/TD Using *Python* Code" was studied by Muzakkiy Putra M. Akhir and Rina Kamila from the Center for Science and Technology of Advanced Material, National Nuclear Energy Agency (BATAN), Tangerang Selatan. High Resolution Powder Diffractometer (HRPD) and Four Circle Diffractometer/Texture Diffractometer (FCD/TD) are two BATAN-owned neutron diffractometers which have been fully operational since 1992. These are used to investigate structure and texture of crystalline materials, respectively. Before analyzing, the acquired raw neutron diffraction data should first be processed in a specific way to achieve the suitable data format required by the analysis software. This data processing step is a repetitive task for every single experiment which is previously done manually and very time-consuming. The purpose of this development project was to optimize this step to be fully automatic and executable by a code. This work was performed by means of *Python* code utilizing the array manipulation in re-arranging and re-formatting the raw data.

“Safety Analysis of Neutron Interaction with Material Practicum Module for the Kartini Internet Reactor Laboratory” was explored by Prasetyo Haryo Sadewo and Puradwi Ismu Wahyono from the Center for Accelerator Science and Technology, National Nuclear Energy Agency (BATAN), Yogyakarta. Kartini Research Reactor is a 100 kW TRIGA (Training, Research, and Isotope Production by General Atomic)-type reactor mainly used for educational and training purposes. A system for remote learning on nuclear reactor physics named the Internet Rector Laboratory has been developed and is fully operational since 2019. To enrich its curriculum, a new practicum module has been developed, that can be immediately implemented and does not require any additional equipment or materials. To ensure safety in reactor kinetics and radiation protection on the implementation of the practicum module, this study performed a safety analysis using MCNP and ORIGEN utilizing the current conditions of the reactor regarding its fuel burn up and control rod positions at a certain power level.

“Transient Analysis of Simultaneous LOFA and RIA in RSG-GAS Reactor after 32 Years Operation” was investigated by Muhammad Darwis Isnaini, Iman Kuntoro and Muh. Subekti 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 postulated accidents. Several design basis accidents (DBA) such as loss of flow accident (LOFA) and reactivity-initiated accident (RIA) also have been conducted separately. The accident analyses carry out calculation for transient condition during RIA, LOFA, and postulated accident of simultaneous LOFA-RIA. This study aims to conduct a safety analysis on simultaneous LOFA and RIA, and investigate the impact on safety margins. The calculations are conducted using the PARET code.

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

Editor in Chief