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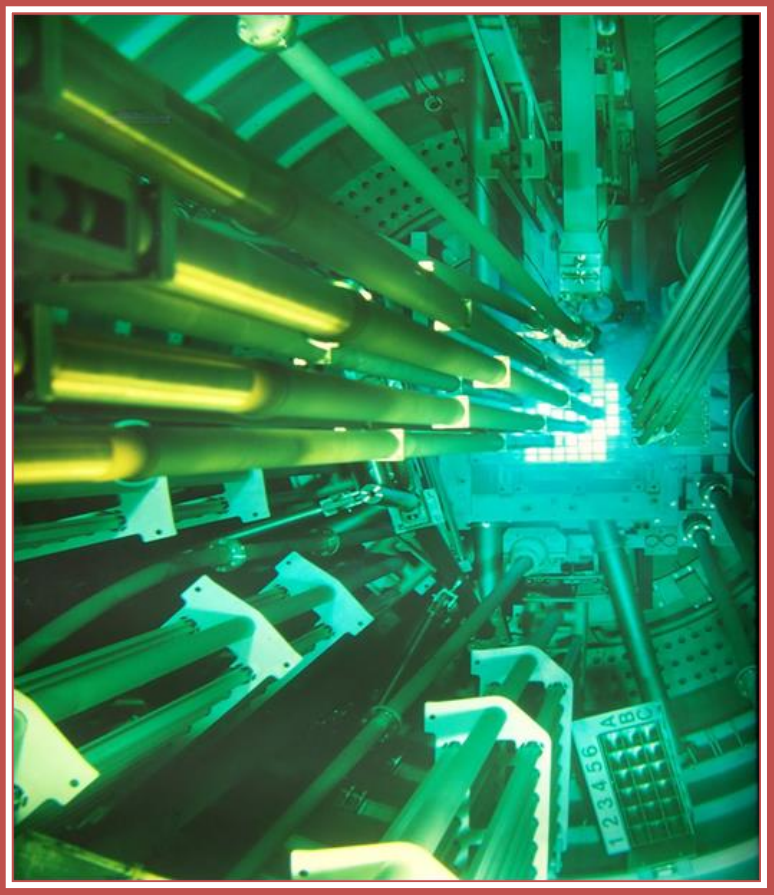

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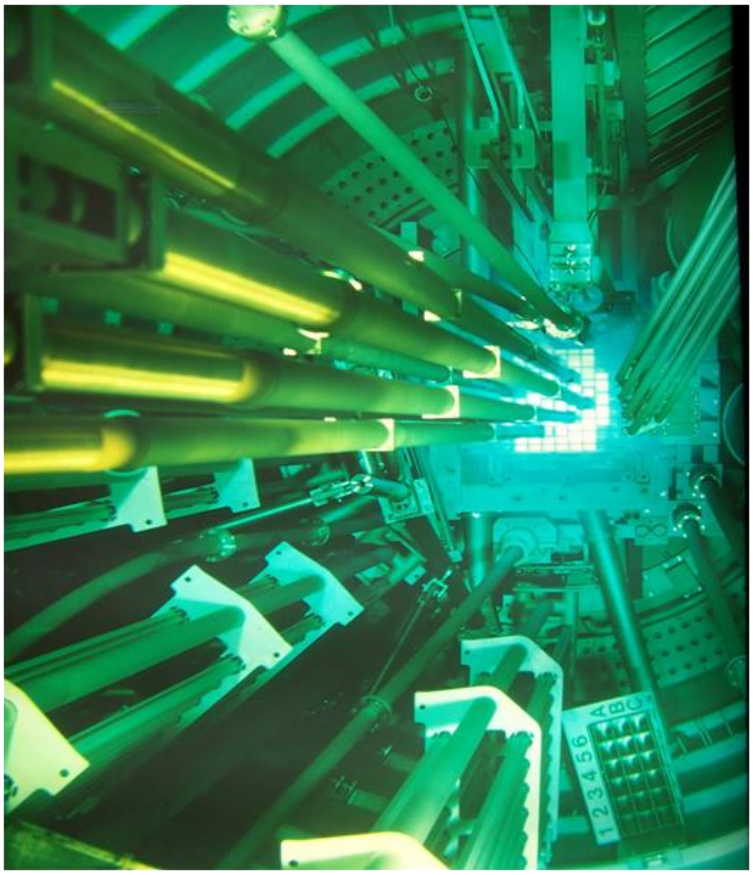

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PREFACE

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 2022 – Vol. 24 No. 1 (February 2022). This issue contains five articles discussing various applications of nuclear technologies and sciences.

The first article "Analysis of Fuel Temperature Reactivity Coefficient of the PWR using WIMS Code" was written by Santo Paulus Rajagukguk and Tukiran Surbakti from the Department of Physics, FMIPA, UNIMED, Medan. They study The Fuel Temperature Reactivity Coefficient (FTRC) in the PWR reactor core, to assess the operation safety of the PWR reactor. The FTRC parameter is an important parameter in design, control, and safety, particularly in PWR reactor. Analysis of the FTRC parameter is using newly WIMDS library based on ENDF/B-VIII.0 nuclear data files. It is expected from this study that the FTRC parameter is negative and better to use ENDF/B-VIII.0 libraries.

The second article "Prediction of Remaining Useful Life for Components in SSC of RSG-GAS Based on Reliability Analysis" was investigated by Entin Hartini, Endiah Puji Hastuti, Geni Rina Sunaryo, Aep Saepudin, Sri Sudadiyo, Amir Hamzah, Mike Susmikanti from the Research Center for Nuclear Reactor Technology and Safety, National Research and Innovation Agency (BRIN), Tangerang Selatan. This research is focused on the prediction of Remaining Useful Life (RUL) for components in SSC of RSG-GAS based on reliability analysis. The purpose of this study is to determine the remaining life of the safety category A component from SSC RSG-GAS based on reliability analysis. The method used in this research is a statistical approach to estimate the RUL. The analysis is beneficial for estimating the remaining useful lives of these components which can then be used to plan for effective maintenance and help control unplanned outages. The analysis can be used for maintenance development and preventive repair planning.

The third article "Analysis of Cogeneration Energy Conversion System Design in IPWR Reactor" was studied by Ign. Djoko Irianto, Sriyono, Sukmanto Dibyo, Djati Hoesen Salimy, Tukiran Surbakti, Rahayu Kusumastuti from the Research Center for Nuclear Reactor Technology and Safety, National Research and Innovation Agency (BRIN), Tangerang Selatan. They study various types of energy sources such as conventional energy sources, new and renewable energy sources including nuclear energy. They have taken the initiative to contribute to the development of technology for providing electricity and other thermal energy, particularly reactor technology as a power plant and a provider of thermal energy. This research aims to analyze IPWR type SMR reactor design as a cogeneration energy conversion system. The IPWR reactor coolant as a cogeneration energy conversion system is arranged in an indirect cycle configuration or Rankine cycle. Energy utilization factor (EUF) calculation shows that the IPWR cogeneration configuration can increase the energy utilization factor.

The fourth article "Dose Distribution Analysis of Proton Therapy for Medulloblastoma Cancer with PHITS 3.24" was explored by Moh. Miftakhul Dwi Fianto, Yohannes Sardjono, Andang Widi Harto, Isman Mulyadi Triatmoko, Gede Sutresna Wijaya, Yaser Kasesaz, from Department of Nuclear Engineering and Engineering Physics, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta. Their research is about particle therapy or proton radiation therapy. The research related to proton therapy is difficult due to a limited number of available proton therapy facilities. This research was

aimed to simulate medulloblastoma brain cancer which is most common in children. The program used in this research was PHITS version 3.24. The human body was modeled with the revised ORNL-MIRD phantom for a child. The therapy scheme was a whole posterior fossa boost. The proton passive scattering was simulated by passing a uniform proton beam through the aperture and compensator with various energy levels. The proton pencil beam scanning was simulated with small cylindrical beams which were adjusted to the planning target volume with layers variations. Dose distribution in passive scattering was relatively better than in pencil beam scanning using dose sampling analysis at some points within the planning target volume.

The fifth article "Measured and Calculated Integral Reactivity of Control Rods in RSG-GAS First Core" was investigated by Wahid Luthfi, Surian Pinem, Donny Hartanto, Lily Suparlina, Dwi Haryanto from the Research Center for Technology Nuclear Reactor and Safety, Research Organization for Nuclear Technology, National Research and Innovation Agency, South Tangerang, Banten. The paper is presented about analysis of the control rod worth in RSG-GAS. One of the important parameters for the operation of a nuclear reactor is a control rod worth. Proper measurement and calculation of the control rod worth are essential for the safe reactor operation under normal and transient conditions that are initiated by a postulated event such as stuck rod, control rods ejection. This paper presents calculation results of integral reactivity of the RSG-GAS research reactor first core and its comparison with the experimental data. Calculations were performed using the continuous energy transport code Serpent 2 with ENDF/B-VIII.0 nuclear data. Calculations were carried out for each method used in control rod measurement data to validate calculated results to experimental data. The results showed that there were no significant differences in calculation results of integral reactivity for the RSG-GAS reactor core.

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