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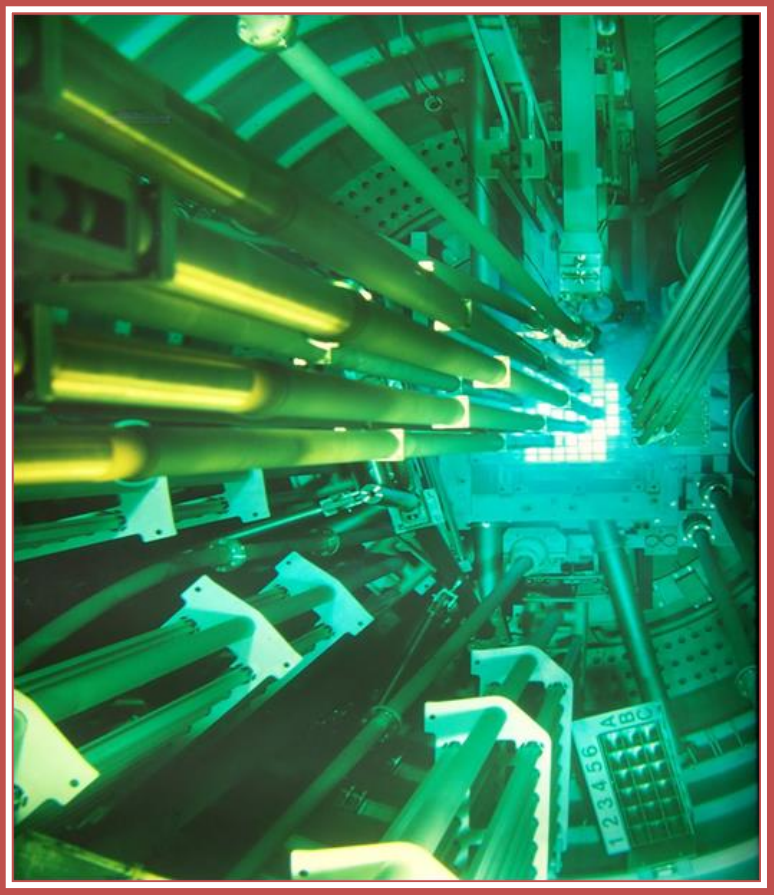

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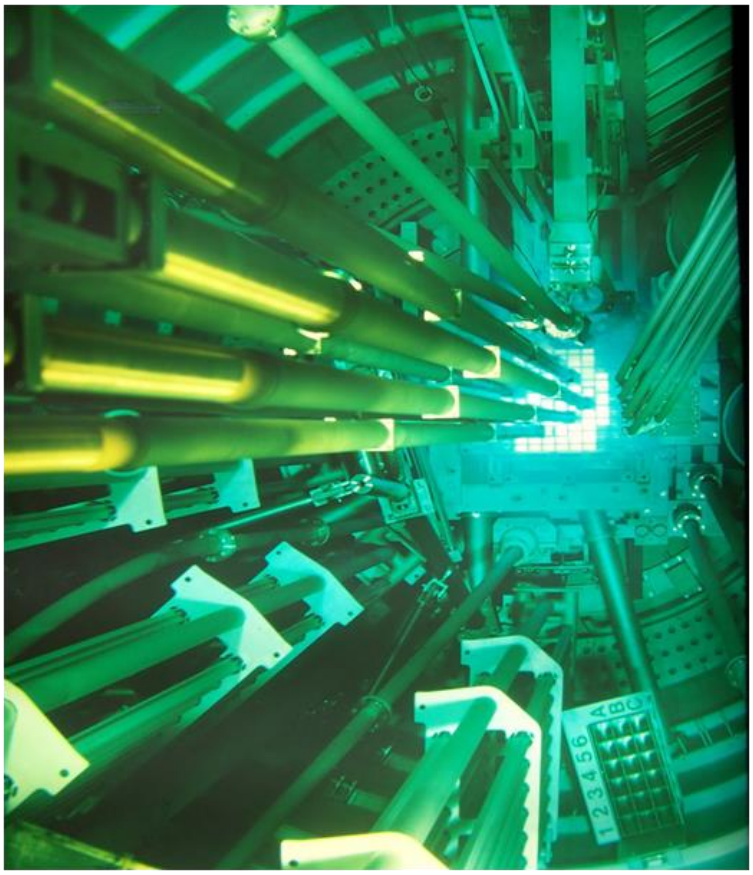

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PREFACE

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 2021 – Vol. 23 No. 3 (October 2021). This issue contains five articles discussing various applications of nuclear technologies and sciences.

The first article "Preliminary Development of Radionuclides Release of Individual Dose Code Program for Radiation Monitoring" was written by Jupiter Sitorus Pane, Pande Made Udiyani, Muhammad Budi Setiawan, Surip Widodo, I Putu Susila from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. They study to provide an appropriate method for developing radiation monitoring system to support the development of nuclear power plant in the near future. The authors developed a code program using Gaussian distribution model approach for predicting radionuclide release and individual dose acceptancy by human being. The model includes estimation of source term from the nuclear installation, release of radionuclides source into air following Gaussian diffusion model, some of the release deposit to the land and entering human being through inhalation, direct external exposure, and resuspension, and predicted its accepted individual dose. This model has been widely used in various code program such as SimPact and PC-Cosyma. The model has been validated using SimPact program and successfully developed.

The second article "Classification of Nuclear Reactor Severe Accidents using Probabilistic Neural Network based on Particle Swarm Optimization" was investigated by Yoyok Dwi Setyo Pambudi from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. This research is focused in the identification and prediction of severe accident scenarios against an initiating event of a nuclear power plant remain a challenging task. This research aims to classify severe accidents at the Advanced Power Reactor 1400MWe (APR1400), which include the loss of coolant accident (LOCA), total loss of feedwater (TLOFW), steam generator tube rupture (SGTR), and station blackout (SBO) using a standard Probabilistic Neural Network (PNN) and Particle Swarm Optimization-based Probabilistic Neural Network (PSO PNN). The algorithm has been implemented in MATLAB. The experiment results showed that supervised PNN PSO could classify severe accident of nuclear power plant.

The third article "Map of Radioisotope Production and BATAN Research Reactor Utilization" was studied by Endiah Puji Hastuti1, Iman Kuntoro, Suwoto, Syarip, Prasetyo Basuki, Tukiran Surbakti, Geni Rina Sunaryo, Sudarmono from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. They study how to increase the production of radioisotopes and radiopharmaceuticals, where reactors play a very important role in the production of certain isotopes. In tracing the data obtained from operational reports related to irradiation requests from reactor users, namely PTRR, PSTNT, and PT INUKI for radioisotope production, which has been carried out in the last 5 years, show that the irradiation request at RSG-GAS is still not optimal. In term of the utilization of RSG-GAS, it can still be optimized, which in this case needs to be balanced with post-irradiation processing capabilities. Meanwhile, from the results of tracing and data collection, it can be shown that at this time the reactors are still operating. The utilization activities of the reactors complement each other according to their age and facilities.

The fourth article “Study on Thermal Characteristics of U-Shaped Heat Pipe” was explored by Mukhsinun Hadi Kusuma, Anhar Riza Antariksawan, Giarno, Dedy Haryanto, Surip Widodo from the Center the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency (BATAN), Tangerang Selatan. Their research about the thermal characteristics of UHP as PCS in the CT. The experiment on small-scale UHP and simulation with RELAP5 code has been conducted to understand the performance of UHP. The experiment results of the small-scale UHP model will be used as a basic understanding of simulating and designing a UHP with big scaling. The study result showed the highest thermal performance of UHP was obtained when it operated on the higher temperature of heat load and higher air cooling velocity. The more UHPs inserted into the cooling pool, the more heat that can be discharged into the environment. This result also shows promising use of UHP for CT PCS. The use of UHP as PCS can enhance the safety aspect of the nuclear reactor, especially in station blackout event.

The fifth article “Criticality Safety Analysis of the Dry Cask Design with Air Gaps for RDNK Spent Pebble Fuels Storage” was investigated by Pungky Ayu Artiani, Yuli Purwanto, Aisyah, Ratiko, Jaka Rachmadetin, Kuat Heriyanto from the Center for Radioactive Waste Technology, National Nuclear Energy Agency of Indonesia. The paper is presented about preparation of dry cask to safely store the spent pebble fuels that generated by the RDNK. The dry cask design has been proposed based on the Castor THTR/AVR but modified with air gaps to facilitate decay heat removal. The objective of this study is to evaluate criticality safety through keff value of the proposed dry cask design for the RDNK spent fuel. The objective of this study is to evaluate criticality safety through keff value of the proposed dry cask design for the RDNK spent fuel. The keff values were calculated using MCNP5 program. The dry cask with air gaps design comply the criticality safety criteria in the aforementioned conditions cancer treatments conducted by proton therapy method. In this study, proton therapy in breast cancer will be simulated. This study aims to identify the optimal dose in breast cancer therapy using proton therapy and to identify the dose exposed in the surrounding organs. This study uses simulation based PHITS program to model the geometry and the components of breast cancer and the surrounding organs.

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