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EDITORIAL

Dear readers,

We are delighted to present the second issue of Atom Indonesia, Volume 52 No. 1 (2026), featuring ten articles that highlight the advancements and applications of nuclear science and technology. These contributions come from a diverse group of authors representing both national and international institutions, emphasizing the global importance and collaborative nature of nuclear research.

We begin with the first article, entitled "**Application of Sub-Miniature Fission Chamber Neutron Detector for Neutron Flux Measurement at the RSG-GAS Reactor: Foil Activation Benchmarking"**. This study aimed to obtain accurate real-time neutron flux measurements at the RSG-GAS reactor using a Sub-Miniature Fission Chamber (SMFC) detector as an alternative to the conventional foil activation method. The findings revealed that, after correction against gold foil activation references, the SMFC provided reliable real-time monitoring with a combined uncertainty of ±4.0%, demonstrating its strong potential as a practical substitute for the more time-consuming conventional approach.

The next article, **"Development of Burnup Fraction Calibration Curve for the Silicide Fuel Equilibrium Core of the RSG-GAS Reactor",** focused on establishing a burnup calibration curve based on the equilibrium core reactivity method. The purpose of the study was to correlate measured fuel reactivity values with known burnup levels in the RSG-GAS reactor. The results showed that the experimental and calculated reactivity values were in good agreement, with a maximum discrepancy of -4.88%, and a usable fuel burnup calibration curve was successfully developed.

An **"Image Quality Assessment of Hybrid Statistical Iterative Reconstruction (H/SIR) in Comparison to Filtered Back Projection (FBP)"**, aimed to evaluate image quality in low-dose computed tomography using H/SIR algorithms from different CT vendors. By comparing Signal-to-Noise Ratio (SNR) and Contrast-to-Noise Ratio (CNR) from 218 clinical images, the study found that H/SIR maintained image quality while allowing radiation dose reduction, highlighting its clinical value over standard FBP protocols.

Next, "**Probabilistic Model of Liquefaction in Serpong and Its Impact on Nuclear Installation Safety"**, investigated liquefaction risk in the Serpong area as a prospective nuclear power plant site. The objective was to assess seismic-induced liquefaction hazards by integrating probabilistic seismic hazard analysis and geotechnical borehole data. The study concluded that liquefaction probability over a 50-year exposure period ranged from 0.5676 to 0.594, with the greatest vulnerability identified in saturated sandy layers at depths of 1–6 meters, emphasizing the need for risk-informed foundation design and safety evaluation.

In the article **"Comparative Assessment of Radioactive Contamination in APR 1400 Reactor During SBO and TMI Accidents",** the text provided in the editorial discusses the estimation of Tissue Phantom Ratio (TPR20,10) under non-reference conditions using a geometric sequence approach. The aim of the study was to develop an alternative method for estimating beam quality when the standard 10 × 10 cm² field size cannot be achieved during LINAC testing. The results demonstrated that the geometric sequence approach produced TPR20,10 values for 6 MV and 10 MV X-ray beams that were not significantly different from TRS-398 reference protocol calculations, suggesting that the method is both precise and clinically useful.

The article entitled "**Evaluation of ALON for Proton Shielding of Low Earth Orbit (LEO) Satellite Solar Arrays"**, examined the shielding performance of ALON and other materials against proton radiation across a broad energy range using SRIM/TRIM simulations. The study aimed to determine whether ALON could serve as an effective protective material for satellite photovoltaic systems in low Earth orbit. The findings indicated that ALON offers a favorable balance between radiation shielding, optical transparency, and structural suitability, making it a promising candidate for satellite solar array protection.

"**Monte Carlo Simulation of Pediatric Chest Radiography: Validation of the Irradose Through Comparison with MCNP**, the researchers sought to validate the custom-developed Irradose program by comparing its dose deposition predictions with those generated by the MCNP Monte Carlo code. Using a simplified pediatric thorax phantom, the study found that both codes showed highly similar depth-dose distributions, with deviations below 5%, confirming the reliability and computational efficiency of Irradose for preliminary pediatric dosimetry studies.

Next contribution article, "**Estimating $TPR_{20,10}$ Under Non-Reference Conditions Using a Geometric Sequence Approach"**, also addressed the challenge of beam quality assessment when reference field conditions are unavailable. Its objective was to compare the geometric sequence approach with several other estimation methods, including the Sauer, Palmans, and linear fit methods, as well as the TRS-398 protocol. The results showed that the geometric sequence method achieved a precision comparable to the TRS-398 protocol and performed better than some alternative estimation methods, supporting its applicability in clinical beam quality evaluation.

In **"The Role of Neutron Absorbers in Soliton Wave Creation Using Heavy Water as a Diffusive Medium"**, investigated the characteristics of burnup soliton waves in a slab reactor core by varying isotopic neutron absorbers. The purpose of the study was to understand how the diffusion coefficient influences soliton wave behavior in nuclear systems. The results showed that increasing the diffusion coefficient affected the burning rate, diffusion length, and transient behavior, while certain ratios remained constant, offering valuable insights into the physical behavior of soliton wave propagation in advanced reactor concepts.

Closing this edition, the tenth article, "**Isolation and Selection of Radiation Resistant Fungi from Mamuju High Natural Radiation Soil for Uranium and Thorium Bioremediation**", explored the potential of indigenous fungi as bioremediation agents for radioactive contamination. The research aimed to isolate radiation-resistant fungal strains and evaluate their tolerance and absorption capacity for uranium and thorium under gamma radiation. The findings identified three highly resistant fungal isolates with remarkable metal uptake performance, demonstrating their strong potential for the bioremediation of radioactive environments.

Each article reflects significant contributions to nuclear science applications, including reactor safety, radiation protection, and environmental monitoring. On behalf of Atom Indonesia, I would like to thank you all for your contributions and endless support that have enabled Atom Indonesia to achieve an outstanding performance over all the years. This outstanding performance could not have been achieved without the great efforts and cooperation of the editors, reviewers, management personnel, authors, and readers. Enjoy reading.

Editor in Chief