BULETIN FKA

UNIVERSITI TEKNOLOGI MARA

Cawangan Pulau Pinang
Kampus Permatang Pauh

EDISI 2025



PENGAJIAN KEJURUTERAAN AWAM

UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG





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Message from Ketua Pusat Pengajian



Assalamualaikum Warahmatullahi Wabarakatuh and greetings,

It is a pleasure to welcome you to the 2025 edition of Buletin FKA. This bulletin brings together the activities, achievements and memorable moments of the School of Civil Engineering, UiTM Cawangan Pulau Pinang throughout the year.

Looking back, 2025 has been a meaningful year for our School. While the achievements recorded in this bulletin deserve recognition, I believe our true strength lies in the people behind them. Every programme, student activity, research initiative and community engagement reflects the time and effort contributed by our lecturers, administrative staff, technical staff and students.

As educators, our responsibility extends beyond delivering academic content. We must prepare our students to think carefully, act professionally and respond confidently to the challenges they will encounter as civil engineers. The engineering profession continues to change, and our students must be ready to work with new technologies while remaining attentive to public safety, environmental concerns and the needs of society.

I am particularly grateful for the cooperation shown by everyone throughout the year. Some contributions are clearly visible through awards, publications and successful programmes, while many others take place quietly behind the scenes. Both are equally important to the continued success of our School.

To our students, I encourage you to make full use of every opportunity available during your time at UiTM. Academic knowledge provides the foundation, but your willingness to learn, communicate and take responsibility will shape the kind of engineer you eventually become.

I would also like to thank our alumni, industry partners and collaborators for continuing to share their knowledge and experience with us. Their involvement helps ensure that our teaching and activities remain relevant to professional practice.

Finally, congratulations to the editorial team and everyone who contributed to this edition. I hope Buletin FKA 2025 will serve as a meaningful record of our shared journey and remind us of what we can accomplish when everyone contributes.

Thank you and Wassalam.

Kapt. (PA) Ts. Dr. Muhamad Faizal bin Pakir Mohamed Latiff
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Technical Talk on the Issues and Challenges in Dam Infrastructure and Open Channel Hydraulics

Nur Azwa Binti Muhamad Bashar and Sabariah Badrealam

The Centre for Civil Engineering Studies, Universiti Teknologi MARA Pulau Pinang Branch, and the Special Interest Group in Forensic Engineering jointly organised the hybrid Hydraulics Series Industrial Lecture on 20 June 2025. The session was delivered by Ir. Ts. Gs. Dr Mohd Rashid Mohd Radzi, Principal Engineer at TNB Genco Sdn. Bhd., and moderated by Ir. Nur Azwa Muhamad Bashar. The lecture aimed to expose students (CEW446: Hydraulics), academic staff, and researchers to current industrial practices in hydraulic engineering, particularly open channel flow hydraulics with uncertainties, rapidly varied flow, hydraulic jumps, and the implications of hydraulic parameters for dam safety and spillway performance.



Poster of the hydraulic lecture series



Opening session by moderator during the hybrid session

The session began with a brief introduction to the broader role of TNB Genco in national energy development, including TNB's contribution to sustainability and long-term energy transition planning in Malaysia through the Malaysia Energy Literacy Program (MELP) and the National Energy Transition Plan (NETR) 1.0. The speaker stressed the importance of connecting hydraulic theory with the on-site current operational realities of hydropower and dam infrastructure. In addition, the speaker mentioned that the severe effects of rapidly varied flow (RVF) are a critical flow phenomenon that directly influences energy dissipation, pressure fluctuation, and local structural response in spillways, stilling basins, and downstream of dam infrastructure

A key contribution of the hydraulic lecture session was its specific focus on real engineering challenges through case-based discussions, including the 2017 slab failure incidents at the Oroville Dam spillway and cavitation issues at Temenggor Dam. Furthermore, the speaker highlighted that dam performance may deteriorate in both the short and long term if issues such as inadequate instrumentation, cavitation, stagnation effects, uplift pressure beneath slabs, and downstream erosion or sedimentation are left unmanaged, especially in ageing structures and dams designed with outdated parameters. These issues are increasingly significant under current operational demands, particularly as hydraulic structures must ensure the highest performance and reliability under higher flows, changing climate conditions, and stricter public safety expectations.

The speaker then outlined an effective approach through a more integrated dam safety strategy to address these challenges. The TNB Dam Safety Assessment Programme was presented as a systematic framework that combines field inspection, hydraulic and sedimentation assessment, remote sensing, borehole and piezometer monitoring, and predictive modelling. The use of physical modelling, including downscaled spillway studies, is important for evaluating flow behaviour, validating design assumptions, and supporting engineering decisions related to maintenance and rehabilitation. Additionally, effective rehabilitation requires close collaboration, coordination and integration among key stakeholders (policy makers, consultants, engineers, contractors, and downstream communities) especially when flow must remain controlled before and during construction works as well as during the operational period.

In a nutshell, the lecture links classroom theoretical concepts with on-site practice by indicating the causal effect relationship. Understanding hydraulic parameters is essential to support safer, more resilient, and sustainable dam infrastructure. The future of safe spillways should focus on improving and continuously monitoring structural and hydraulic conditions, periodic maintenance and rehabilitation of ageing components, redesign energy dissipation systems, and expanding the use of integrated forecasting tools (physical, numerical, and data-driven) for early anomaly detection. Dam operators and designers must adopt proactive safety assessment, climate-responsive hydraulic design, and evidence-based decision-making throughout the dam life cycle to ensure the highest structural integrity and controllable flow.



Hydraulic Lecture session (face to face)



Token of appreciation given by PPKA to the Speaker