FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

UNENE G.Dip

Date of Desk Audit: March 23rd 2023

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the graduate diploma in UNENE. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the UNENE program submitted a self-study in February 2023 to the Vice-Provost and Dean of Graduate Studies to initiate the cyclical program review of its graduate diploma. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis. Appendices to the self-study contained the CVs for each full-time member in the department.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Engineering, and selected by the Vice-Provost and Dean of Graduate Studies. The review team reviewed the self-study documentation and then conducted a desk audit on March 23rd, 2023. The review included interviews with the Vice-Provost and Dean of Graduate Studies, and leadership of the program.

The Director of the program and the Dean of the Faculty of Engineering submitted responses to the Reviewers' Report (September and November 2023 respectively). Specific recommendations were discussed and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**

The review team highlights the strengths of the UNENE Graduate Diploma program:
Relevance to the sector and linkage to the UNENE M.Eng. program.

Like the UNENE M.Eng. program, the Graduate Diploma program is designed to provide opportunities for industry professionals to improve their skills and competency. This program is part of UNENE's core mission to build nuclear capacity in Canada by educating knowledgeable, highly qualified personnel.

As the review team notes, the Diploma program is also connected closely to the M.Eng. program — the same courses are taught by the same professors, with the same expectations of assessment and high standards of preparation.

Students are able to network with each other, fostering opportunities for networking within and outside of their organizations.

- **Areas for Enhancement or Improvement**

UNENE can focus further on defining the connection between the M.Eng. and Diploma programs by exploring how to facilitate and clarify the transition process between them. Engagement with industry should be enhanced by identifying specific needs and challenges that industry organizations face in developing a skilled workforce. Likewise, learning from the current industry landscape to ensure that course modules remain up to date with the most relevant information, and exploring the usage of different delivery technologies and models (including online/asynchronous elements) will facilitate the participation of more students in the program.

Implementation Plan

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow-Up	Timeline
1. UNENE should discuss with the nuclear industry and identify what future challenges the industry believes it will face, but also challenge the industry on those areas UNENE believes are opportunities for industry, such as security, safeguards and human factors.	Proposed actions: 1. UNENE is undergoing an education needs assessment with major industry organization partners, to understand challenges and future needs and how they relate to UNENE educational offerings. UNENE will collect and analyze the response data from industry to produce an education needs report, including needs at the basic level (introductory courses), intermediate level (professional development), and advanced level (graduate education — M.Eng. and Diploma). 2. UNENE organizes annual workshop attended by universities and nuclear industry organizations. UNENE will ensure that the industry continues to provide information on the topics and areas of importance to the industry, including the aforementioned areas, but much more, such as operational needs, refurbishment needs, new build needs, etc.	1. Allan Lew leading collection of data 2. Data analysis and translation for graduate education — Nik Popov, Raluca Petria 3. Organization of UNENE annual workshops – Ben Rouben	September 2024

2. UNENE look at migration from the M.Eng. program to the Diploma and vice versa, and examine what options there are for students.	Proposed actions: 1. UNENE will develop a clear guideline/policy for migration from M.Eng. to Diploma and vice versa. 2. UNENE will bring this guideline for approval and official adoption at the level of the Education Advisory Committee. 3. UNENE will produce a general UNENE Student Handbook in collaboration with all core universities, which will include the M.Eng.-Diploma migration guideline among all other student-relevant information. 4. UNENE will make this document available to students directly as well as on the UNENE website. 5. UNENE will update this handbook yearly.	Raluca Petria, with collaboration from grad admins at other schools Oversight by Nik Popov	May 2024
3. UNENE continues to examine how modules continue to be relevant, and are updated when needed. Updates should focus on changes in the sector relevant to the Canadian Nuclear Industry, but also those which are seen as upcoming in the future, e.g SMRs, new reactor technologies, security, safeguards, human factors.	Proposed actions: 1. UNENE professors regularly conduct reviews of course content to ensure relevance to current nuclear industry landscape in Canada. On an ongoing basis, UNENE will work with course professors ahead of course delivery to update material appropriately. 2. As part of the UNENE efforts to introduce an online delivery method for all UNENE graduate courses, UNENE instructors will conduct a review of the relevance of the course content, materials and delivery method. Pilot courses to perform this activity will be UN802 (upcoming Fall 2024) and UN803 (upcoming Winter 2024).	Nik Popov, Raluca Petria	June 2024
4. The Diploma and M.Eng program look at alternative methods for delivery, using asynchronous delivery. This could allow more students to take part across Canada.	UNENE is currently preparing an application for transition to online program delivery. Proposed actions: 1. UNENE will produce and submit a proposal to the Engineering GCPC in Fall 2023 for transition	Nik Popov, Raluca Petria	Target dates for conversion of UN802 for online delivery: October 2023 — submission

	of a pilot course (UN802 — Fall 2024). 2. UNENE has and will continue to collaborate with UN802 course professors, UNENE EAC + EAC Subcommittee, other UNENE Academics, and additional online education experts (ex., MacPherson Institute), to create a robust and engaging delivery model for UN802 that will serve as the basis for future online delivery models for all UNENE courses. 3. UNENE will collect feedback data from participants in online course UN802, including students and professors, and produce a summary document of lessons learned and areas for improvement. 4. UNENE will use the feedback data and summary of findings to produce and submit an additional proposal to the GCPC for transition of the entire UNENE education program to online delivery, including all courses at all schools. UNENE will ensure that all member schools are able to provide input and approval for the proposed changes, to ensure a smooth transition for all students.		of UN802 online proposal September-December 2024 — delivery of UN802 online
5. Given that the Diploma is delivered at the same time as the M.Eng, using the same criteria for individual module assessment, future program reviews should occur at the same time as M.Eng program reviews. This will minimize the duplication of work, and maximize effectiveness of review.	Proposed actions: **1.** UNENE will coordinate with McMaster University to ensure that future program reviews for the M.Eng. and Diploma programs are conducted in parallel, beginning with the M.Eng. program review scheduled for 2027-2028.	UNENE Education Program Director, UNENE Grad Admin	N/A

Faculty Response

The Faculty greatly appreciates the time and thoughtful comments given by the review team, in regards to UNENE's graduate diploma in Nuclear Engineering. Their report and the implementation plan offered by the UNENE academic leadership has been reviewed by the Faculty. The recommendations related to updating the program content with currently emerging topics and an assessment of future challenges are well received and we fully expect the program team to tap into the expert knowledge on Nuclear Engineering found in our Faculty. The Associate Dean of Graduate Studies will be able to help coordinate these changes in content with the other associated universities in the UNENE network.

The recommendation of asynchronous delivery is not so easily implemented in this case as it presents national security risk concerns, requiring means of limiting access to non-Canadian citizens and avoid the transmitting lectures beyond the boundaries of Canada. Control over who took the program was straightforward when lectures were in-person and close to the major nuclear facilities in Ontario, since no one but employees of those facilities could attend but asynchronous delivery opens up a potential pandora's box. We are working with the program team and McMaster's lawyers to find acceptable means to follow through with this recommendation because we recognize the program needs to reach a larger cohort of students in order to remain fiscally viable.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation at the March 20, 2024, meeting. The committee recommends that the **UNENE G.Dip** program should follow the regular course of action with an 18-month progress report and subsequent full external cyclical review to be conducted no later than eight years after the start of the last review.