

The Development of a Undergraduate Minor Concentration in Nuclear Fission Power Engineering

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With the renewed interest in nuclear power as a key component of the nation's energy portfolio, there is a growing concern about the availability of engineers trained in nuclear technology in view of the very significant erosion in university nuclear engineering programs and facilities over the past two decades. Even with a rapid infusion of new resources, the time required to rebuild the necessary faculties and facilities and stimulate student interest makes it highly unlikely that conventional nuclear engineering programs can provide a flow of graduates adequate to meet the near-term needs of industry and the federal government.

As an alternative, we have explored the development of a national curriculum in nuclear fission power engineering that would serve as a certificate-based, minor concentration for undergraduate students majoring in traditional engineering degree programs such as mechanical, electrical, chemical, and computer engineering. The proposed program would augment conventional undergraduate engineering degree programs with a four-course sequence offered in the junior and senior years, accompanied by a summer practicum involving extensive laboratory experience at a regional university reactor facility, a national laboratory, or an industrial site. The proposed nuclear-power minor curriculum would be supported by extensive computer and network resources, including nuclear code simulation packages, web portals, and technology-enhanced learning for on-campus and off-campus distance education.

Through extensive surveys conducted by the University of Wisconsin, we have established strong interest in such programs on the part of industry, government, and prospective students. Industry representatives have expressed interest in hiring nuclear engineers more broadly trained in general engineering majors, while many students view such a nuclear power minor concentration as a more attractive alternative to a specialized nuclear engineering major. Since the proposed program would be highly transportable, drawing its content from faculty members at nuclear engineering programs across the nation and subsidized, in part, by industry and the federal

government, it would broaden considerably the number of institutions capable of offering instruction in nuclear fission power engineering.