



XA0202419

Feeding the Nuclear Pipeline: Enabling a Global Nuclear Future

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There is nothing more vital to the advancement of human civilization than the abundance of useable and affordable energy. It underpins national security, economic prosperity, and global stability.

Nuclear energy, which exhibits a unique combination of environmental and sustainable attributes, appears strongly positioned to play a much larger and more pivotal role in the mix of future global energy supplies than it has played in the past. Unfortunately, after a fairly rapid growth period within the industrialized nations in the 1960 to 1980 time frame, a variety of factors led to a substantial reduction in commercial nuclear power plant construction (with the possible exception of several Pacific Rim countries). This, in turn, led to a serious erosion in the enrollment patterns of nuclear engineering programs—causing alarmingly low enrollment levels in many countries by the turn of the century.

Numerous studies conducted over the past five years have soberly come to the consistent conclusion that the nuclear pipeline cannot keep up with the needs of the nuclear industry. In fact, when combining the aging work force with low matriculation rates in most nuclear engineering academic programs, a huge (and unacceptable) mismatch between needs and supply is strikingly evident. This is further exasperated by the lack of meaningful efforts to capture the knowledge of the “first nuclear era” professionals in a form that can be effectively transferred to the upcoming generation. Methods *must* be found to better capture the enormous body of experience already accumulated and both document it and then mentor the new nuclear engineers that do enter the work force to enable them to build upon this experience, rather than having to re-create it.

On the positive side, enrollment patterns in the majority of nuclear engineering programs still in existence within the United States are now generally on the rise, at least at the undergraduate level. Some programs have experienced at least a doubling or more of their undergraduate enrollments in the past half-decade. This has happened as the college generation is being exposed to a “nuclear renaissance” atmosphere in the United States. The excitement associated with new designs and serious renewed construction dialog, the possibility of producing hydrogen to service the huge transportation sector, the drama of deep space exploration, etc.—all combined with attractive scholarship programs and high starting salaries—are playing a significant role in the rebound. A few of the particularly successful efforts initiated by various sectors of the U.S. nuclear infrastructure to stimulate this rebound will be shared in the hope that some of them might be beneficially employed in other global settings.