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## Safeguards by Design in Nuclear Engineering Design Courses

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Engaging professionals across the breadth of the nuclear industry to educate them on international safeguards objectives and methodology is logistically challenging, especially in the United States, where individuals may not interact with the IAEA and are not as familiar with implementing international safeguards. However, incorporating international safeguards concepts into the mandatory curriculum of nuclear-related university degree programs around the world, complementary to nuclear safety and security concepts, could reach individuals who will go on to be professionals acting in a variety of roles across the nuclear industry (e.g., developing nuclear-related advanced technologies, designing or operating nuclear facilities, serving as State regulators). This would ultimately lead to more effective and efficient safeguards, including helping to move safeguards by design from a concept to a standard practice, as future designers, operators, and State regulators would be more familiar with international safeguards. This could also potentially address human resource challenges by creating a broader base of individuals knowledgeable about the IAEA mission from which to draw future inspectors and analysts. In order to implement this idea, the Y-12 National Security Complex in Oak Ridge, Tennessee, in conjunction with the Center for Nuclear Security Science & Policy Initiatives (a research institute associated with Texas AM; University), targeted nuclear engineering undergraduate students taking the mandatory design course at Texas AM; and the University of Tennessee. The project objective was to introduce safeguards by design concepts to individuals who are planning to work in a broad range of nuclear-related careers. This paper describes the project methodology, which included the project leads creating and presenting lectures on safeguards to the design class and mentoring teams working on design team projects that incorporated safeguards. The paper also identifies lessons learned while incorporating safeguards topics into nuclear engineering university degree programs.

### Which "Key Question" does your Abstract address?

CHA1.1

### Which alternative "Key Question" does your Abstract address? (if any)

CHA1.2

### Topics

CHA1

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