**Regulation of the Commercial Nuclear Fuel Cycle**

With the multitude of applications of nuclear science, it is important that this field is well-regulated and permeated by a culture of safety. Indeed, one of the primary strengths of the commercial nuclear power industry is that it is thorough regulated. The industry is monitored at both international and national levels by agencies that enforce policies of safety both for workers as well as facility operation. Other regulations such as nonproliferation are meant to promote peaceful use of nuclear technology.

The International Atomic Energy Agency (IAEA) is an intergovernmental body founded in 1957 in response to the discovery of nuclear science and the development of nuclear reactors. The field of nuclear energy was in its infancy and international standards had to be established for countries beginning to employ nuclear power. Headquartered in Austria, the primary aim of the IAEA is to promote peaceful and safe use of nuclear power and to prevent misuse of this technology.

Currently 171 member states are part of the IAEA. These states form a unique international collaboration that helps drive innovation in the field. Additionally, member states receive support from the IAEA in areas relevant to nuclear science, such as medicine, environment, and agriculture. Most importantly, these states agree to the safety standards and policies set by the IAEA, one of the most prominent of which is nonproliferation. Under nonproliferation, member states commit to use nuclear power for peaceful purposes. Generation of isotopes (atoms of the same element with different numbers of neutrons) used for nuclear weapons is strictly monitored to ensure it does not exceed certain limits.

Agencies also operate at the national level to help promote safe use of nuclear power. In the United States, the Nuclear Regulatory Commission (NRC), the Environmental Protection Agency (EPA), and the Department of Energy (DOE) work together with state agencies to achieve this purpose. For example, the NRC is responsible for licensing facilities for use of nuclear power. Additionally, they enforce safety standards regarding public health and the environment set forth by the EPA. Finally, to encourage advancement and innovation in nuclear energy, the DOE promotes research on developing technology and science to foster national security and clean energy, among other initiatives.

By working in tandem, international and national agencies help monitor the commercial nuclear power industry to enforce policies and regulations that promote safe and responsible use of nuclear energy.

**References:**

International Atomic Energy Agency: <https://www.iaea.org/>

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