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| Sustaining Nuclear Safety: Upholding the Core Regulatory Values | | |

Nuclear Energy and management of safety therein, has a somewhat distinct streak in that from its early days it has had the privilege of being shaped and supervised by the eminent scientists and engineers, in fact it owes its very origin to them. This unique engagement has resulted in culmination of the several safety elements like defence-in-depth in the form of multiple safety layers, redundancy, diversity and physical separation of components, protection against single failures as well as common cause failures right at the beginning of designing a nuclear reactor.

The fundamental principles followed by regulators across the globe have many similarities such as, creation of an organization which has a conflict-free primary responsibility of safety supervision, laying down the safety criteria and requirements for the respective industry and developing and using various tools and regulatory methodology to ensure adherence to the laid down regulatory requirements. Yet the regulatory regimes in different States have evolved differently and therefore, has certain attributes which are unique to these and confer on them their identity.

In India, the legal structure providing for activities pertaining use of atomic energy itself, evolved in close collaboration with scientists and engineers involved in the activities of use of atomic energy and methodologies developed in this regard were inherited into the present-day system and form the basis of safety regulation. This paper introduces the principal tenets of regulatory philosophy of Indian regulatory regime which have assisted it in realizing its full potential. The central idea of the discussion is to bring out those distinct attributes of Indian nuclear regulatory regime which, has helped AERB in continual improvement of safety in Indian NPPs. The paper further corroborates the premise that a systematic adherence to fundamental values together with the conscious efforts to do away with any form of complacency can significantly benefit any nuclear safety regulator, as has been observed around the globe. As a result of this, rather few areas were identified for further safety augmentation in the various India carried out several review exercises in post Fukushima scenario. Towards the end, an assessment of few potential challenges has been made, which might need to be addressed by AERB in future, if the private entities are also deemed eligible for operating the NPPs.

A number of aspects have to be thoroughly considered and carefully implemented in order to establish an effective regulatory system. Amongst these the foremost ones which constitute the principal tenets of Indian regulatory system and have also been adopted globally, have been discussed in this paper namely: development of competent human resource; learning from the experience to improve on existing level of safety; reliance on scientific principles in regulatory decision making; early adoption of Periodic Safety Review System for licensing of the nuclear facilities; making a conscious effort that regulations don't dilute the Licensee's responsibility for ensuring safety; consideration of stakeholders' views in development of regulatory requirements &

decision-making and emphasis on regulatory research to strengthen the decision-making process in times of fast changing nuclear technologies.

In the aftermath of Fukushima accident, as elsewhere, India too carried out an in-depth review of existing safety-levels in its NPPs and concluded that while adequate safety-margins exist to cope up with external events considered as design bases; as an abundant caution further safety augmentation is needed for addressing the external events beyond design bases. Pursuant to objective of strengthening the nuclear safety globally in the aftermath of Fukushima accident, international community unanimously adopted 'Vienna Declaration on Nuclear Safety' in 2015. The Declaration seeks to achieve significant safety enhancements in the nuclear power plants all over the world, both new as well as the existing ones and calls for enhancements in the design, siting and construction of nuclear power plants, with the objectives of preventing accidents and mitigating possible radioactivity releases, should an accident occur and avoiding early and large radioactivity releases. It has been further highlighted that owing to its adoption of aforementioned core regulatory values, implementation of actions identified to achieve the objectives of the Declaration can easily be effected through simple augmentation of existing regulatory structure.