



Contribution ID: 83

Type: **Dialogue Session**

Dialogue Session Contributing Paper: Development of the KINS Safety Culture Maturity Model for Self and Independent Assessment

Wednesday, 24 February 2016 15:45 (1h 15m)

Synopsis

Safety culture of an organization is cultivated and affected not only by societal and regulatory environment of the organization, but by its philosophies, policies, events and activities experienced in the process of accomplishment of its mission. The safety culture would be continuously changed by the interactions between its members along with time as an organic entity.

In order to perform a systematic self- or independent assessment of safety culture, a safety culture assessment model (SCAM) properly reflected cultural characteristics should be necessary. In addition, a SCAM should be helpful not only for establishment of right directions, goals and strategies for safety culture development, but for anticipating obstacles against safety culture development in the process of the implementation derived from the assessment results. In the practical aspects, a SCAM should also be useful for deriving effective guidelines and implementation of corrective action programs for the evaluated organization.

Korea Institute of Nuclear Safety (KINS) performed a research project for six years to develop a SCAM satisfying the above prerequisite characteristics of SCAM for self- and independent assessment. The KINS SCAM was developed based on five staged Safety Culture Maturity Model proposed by Professor Patrick Hudson and was modified it into four stages by reflecting safety culture assessment experiences for Korean nuclear power plants. In order to define the change mechanism of safety culture for development and reversion, the Change Model proposed by Prochaska & DiClemente was introduced into KINS SCAM and developed into the Spiral Change Model.

Through the Comparison study with the International Atomic Energy Agency's (IAEA) Three Stage Development Model & Kolb's Learning Model, it was confirmed that the KINS SCAM & Spiral Change Model overcome the limitations of IAEA's Model & Kolb's Model by distinguishing the representative characteristics of each stage clearly and supplying an articulate explanation for the mechanism of development and reversion of safety culture. In addition, the Spiral Change Model defines the complacency states in each development stage to be able to establish discriminated strategies against level of safety culture while IAEA's model simply describes complacency state as the second stage of organizational decline. The representative characteristics reflecting the organizational hierarchy of Korean nuclear power plants were defined for each level of safety culture against safety culture components developed by the KINS. The defined characteristics were amalgamated into the modified Matrix Model proposed by Professor James Reason and Patrick Hudson to analyze assessment results systematically.

Development of effective regulatory intervention strategies based on the results of safety culture independent assessment was one of the main objectives of the research. The fundamental principles for establishing regulatory interventions against four safety culture levels were developed. The regulatory response strategies proposed by OECD/NEA were reflected and integrated into the KINS SCAM. We expect that the developed intervention principles would be applied for evolving detailed regulatory intervention strategies against each

level of safety culture.

After the International Nuclear Safety Group (INSAG) introduced firstly the concept of safety culture into the nuclear industries, the IAEA and its member countries have been giving much efforts of developing effective assessment models for nuclear safety culture. According to the IAEA's report for the Fukushima Daiichi accident, the need to implement a systematic approach to safety culture synthesizing the interaction between humans, technology and organization has been emerged. The KINS SCAM and research experiences would be one of references for development of a systematic approach for safety culture self and independent assessment.

Country or International Agency

Republic of Korea

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YES

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Session Classification: Dialogue Session