

## Improvements of the Regulatory Framework for Nuclear Installations in the Areas of Human and Organizational Factors and Safety Culture

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The paper presents the development of regulatory requirements in the area of human and organizational factors taking account of the lessons learned from major accidents in the nuclear industry and in particular of the factors that contributed to the Fukushima Daiichi accident and the improvement of the regulatory oversight of nuclear safety culture. New requirements have been elaborated by the National Commission for Nuclear Activities Control (CNCAN) on the nuclear safety policy of licencees for nuclear installations, on independent nuclear safety oversight, on safety conscious work environment and on the assessment of nuclear safety culture. The regulatory process for the oversight of nuclear safety culture within licencees' organizations operating nuclear installations and the associated procedure and guidelines, based on the IAEA Safety Standards, have been developed in 2010–2011. CNCAN has used the 37 IAEA attributes for a strong safety culture, grouped into five areas corresponding to safety culture characteristics, as the basis for its regulatory guidelines providing support to the reviewers and inspectors, in their routine activities, for recognising and gathering information relevant to safety culture. The safety culture oversight process, procedure and guidelines are in process of being reviewed and revised to improve their effectiveness and to align with the current international practices, using lessons learned from the Fukushima Daiichi accident. Starting with July 2014, Romania has a National Strategy for Nuclear Safety and Security, which includes strategic objectives, associated directions for action and concrete actions for promoting nuclear safety culture in all the organizations in the nuclear sector. The progress with the implementation of this strategy with regard to nuclear safety culture is described in the paper. CNCAN started to define its own organizational culture model and identifying the elements that promote and support safety culture. This action has been taken based upon a recommendation received from the 6th Review Meeting of the Contracting Parties to the Convention on Nuclear Safety, to have assessments of the safety culture of the regulatory authority, acknowledging that the culture of the regulator may have an influence on the safety culture of the licencees. A limited exercise for a safety climate survey has been implemented for CNCAN staff involved in the regulatory review and inspection activities for nuclear installations. The same 37 attributes of a strong safety culture promoted by the IAEA have been used, in a slightly adapted form, also for the safety climate survey for CNCAN staff. The experience with the development and improvement of the regulatory framework, regulatory oversight process and safety culture in the regulatory organization are all described in the paper and may prove useful for regulatory authorities of other countries.