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Implementation of Lessons Learnt from Severe Accidents for Instrumentation and Control Systems of Ukrainian NPPs

Lessons learnt from severe accidents at NPPs are one of the main factors defining NPP progress. The paper is devoted to the consideration of these lessons in respect to instrumentation and control systems (I&C) of Ukrainian NPPs. The accident at Three Mile Island NPP has shown a lack of available methods of information presentation to personnel. The main conclusions of this accident in Ukraine was the creation (with support of USA organizations) of safety parameters display systems (SPDS), which were implemented at 11 units with VVER-1000. The tasks resulting from Chernobyl NPP accident for I&C systems mainly included the development of a new approach to ensuring safety culture by NPP personnel and I&C designers, state review of nuclear and radiation safety for all I&C important to safety, development of regulatory documents with requirements for I&C safety. The main challenges after Fukushima NPP accident were to perform stress-tests of I&C hardware, tighten requirements for I&C resistance to environment impacts, develop new systems (e.g., post-accident monitoring systems).

Keywords: NPP, instrumentation and control system, Fukushima, Chernobyl, Three Mile Islands.