



IRIS (International Reactor Innovative and Secure) – Progress in Development, Licensing and Deployment Activities

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The International Reactor Innovative and Secure (IRIS) is an advanced, integral, light-water cooled, pressurized reactor of medium generating capacity (1000 MWt, or about 335 MWe). It is being developed by an international team—led by Westinghouse—that includes 19 organizations from 10 countries. The preliminary NSSS design has been completed, and the reactor is currently in the pre-application review process with the U.S. Nuclear Regulatory Commission (NRC), aiming at final design approval around 2010-2011, and deployment in the next decade (about 2015). Basic design features are presented in the paper, together with the main safety characteristics. The unique IRIS “safety-by-design”™ approach allows significant simplification of the passive safety systems, improving safety while simultaneously reducing the overall cost. Moreover, it may support licensing the power plant with reduced off-site emergency response requirements, with further positive socio-economic impact. Testing required to validate its advanced design features has been initiated, and multi-national licensing is being considered. The modular IRIS—with each module rated at ~335 MWe—is in general an ideal size for smaller energy grids as it allows introducing sequentially single modules in regions only requiring a few hundred MWs at a time. The performed top-down economic analysis indicates that the cost of generated electricity is competitive with other nuclear and non-nuclear power plants. With its moderate size and short construction time, IRIS significantly reduces the financial burden and presents a viable solution for markets (or countries) with limited investment capital. Analysis accounting for the specific conditions of the Croatian electric grid and market, and considering several alternatives for introducing new power plants, confirmed this general expectation. Moreover, it showed that introducing IRIS may enable Croatia to meet its Kyoto obligations.

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