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Usage multistage approach for detailed definition of spent nuclear fuel thermal state

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Two approaches usually are used at thermal safety assessment of the spent nuclear fuel storage: conservative calculation and detailed simulation of thermal state. For the second one the multistage approach was developed which allows to calculate thermal contours of containers' group, single container, spent fuel assembly and fuel rod with taking into account their mutual influence and influence of outer factors (weather conditions and solar irradiation). All calculations were done for the Dry Spent Nuclear Fuel Storage Facility on Zaporizhska NPP. Temperature state of containers on the open-air storage platform under wind influence were received. With taking into account the changes inside container's ventilation system the temperature of spent fuel assemblies (Fig.1) and maximum temperatures of each fuel rods were calculated. Detailed data about thermal state of spent fuel during dry storage are planned to be used at thermal stress calculations and ageing assessment.

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Yes

Country or International Organization

Ukraine

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