

UPGRADING OF EMERGENCY ALARM SYSTEM ABOUT A SELF-SUSTAINING CHAIN REACTION IN THE «FRESH» FUEL STORAGE AT THE RESEARCH NUCLEAR REACTOR IRT-T

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The results of works on upgrading of the self-sustained chain reaction alarm system (hereinafter referred to as SSAS) in the "fresh" nuclear fuel storage (hereinafter referred to as "Storage") at the IRT-T nuclear research reactor (hereinafter referred to as NRR IRT-T) are presented.

The storage facility is part of the IRT-T nuclear research reactor nuclear fuel storage and transportation system, is located in the reactor building and is designed to store fuel assemblies after they are received from the manufacturing plant before they are loaded into the reactor core.

In accordance with clause 4.1.9 of NP-061-05 [1] the storage facility shall be equipped with EAS SSCR. The system is designed to quickly detect and notify the personnel about the occurrence of SCR in the NFZ. In case of accidental criticality in the IRT-T nuclear fuel storage the system generates light and sound emergency signals of the necessity of immediate evacuation of the personnel from the NFC to the assembly point.

According to NP-016-05 [2] the EAS SSCR is a system of normal operation important for safety. Every year more and more stringent requirements are put forward to it, which are regulated by STO 95 12004-2017 [1]. At the present time works on its modernization are performed at the IRT-T.

Specialists of "Instrument Plant "Signal" developed the design documentation, passed expert review and received a positive expert opinion on nuclear safety of IPPE JSC. The design provides for one control point located in the storage room.

In accordance with the requirements of clause 4.2 Industry Standard 95 12004-2017 [3], during the system design the boundaries of NHZ and the zone of greatest danger in case of SSCR, as well as its triggering thresholds were determined.

The basic element and self-sufficient control point of the EAS SSCR was chosen as a measuring-signalizer emergency DRG-1MK-02 (hereinafter - the meter). The meter has the OIAE Certificate of Conformity valid for the entire operation period of the meter. Additionally, the function of continuous remote monitoring of gamma radiation dose rate at the location of SCR detector units is provided for external NWD diagnosis of radiation situation, including after SSCR.

The developed set of technical means of EAS SSCR based on the measuring-signalizer of emergency DRG-1MK-02 corresponds to the existing normative-legal base regulating the issues of EAS SSCR design and operation and meets the latest standards in this area.

REFERENCES

1. NP 061-05 Federal Standards and Rules in the Field of Use Atomic Energy. Safety Rules for Storage and Transportation of Nuclear Fuel at Nuclear Facilities. Entered into force on May 01, 2006.
2. NP 016-05 Federal Standards and Rules in the Field of Use Atomic Energy. General Safety Provisions for the Nuclear Fuel Cycle Facilities (OPB OYaTTs). Entered into force on May 01, 2006.
3. Industry Standard 95 12004-2017 General rules for design and operation of alarm systems for self-sustaining nuclear fission chain reaction and organization of measures to limit its consequences. Entered into force on April 24, 2017.

INVESTIGATION OF THE RESISTANCE OF AlGaInP LEDs ($\lambda = 630$ nm) TO IRRADIATION WITH FAST NEUTRONS

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