

September 15, 2023

Dr. Gougar

Reactor Administrator:

This letter is to inform you that on September 14, 2023 at 16:00, it was discovered that a reportable occurrence may have occurred at ISU AGN-201 License # R-110, Docket # 50-284.

The discovery is that the Data Acquisition System (DAS) is causing abnormal response to channel 1 and channel 2 power indication when the DAS is de-energized. The system addition was initially screened (ISU-50.59-4) on December 21, 2022 and it was concluded that:

“This project does not involve changing how an SSC is utilized or controlled that is outside the reference bounds as described in the FSAR. The ADC (analog to digital converter) is only able to convert the analog signal into a digital signal for recording and is not able to be reversed to input a signal into the console and has no control functions. Further, the FSAR design basis accident clearly assumes all indication has failed. All the signals will be read using a voltage on a high impedance device and will not disrupt the circuits’ function (equivalent to using a voltmeter). This system will also not interface with the SCRAM circuits, so it won’t be possible for the system to override a SCRAM signal and prevent the reactor from shutting down.”

On September 7, 2023 an SRO noted that channel 1 and channel 2 initially responded abnormally during preoperational checks. It was determined that the DAS system had been de-energized possibly by a power outage the night before. The DAS was re-energized and channel 1 and channel 2 both returned to normal. Preoperational checks were able to be completed but the reactor start up was not completed due to the end of class time.

On September 14, 2023 a discussion occurred concerning the initial abnormal response of channel 1 and channel 2 when the DAS was de-energized and it was determined that further investigation was needed to fully understand the potential effects to the reactor power channel indications. A plan was developed and approved by the Reactor Administrator to perform applicable steps of OP-1 to perform pre-operational and rod-drop tests with DAS energized and with DAS de-energized. With DAS energized, all indications and pre-operational checks were normal. With Safety Rod 1 and 2 inserted (reactor not critical), channel 1: 600 cps, channel 2:  $1.8 \times 10^{-11}$ , Channel 3: 33% of 10mW.

As planned, a rod drop test was to be performed while de-energizing DAS to determine the effect if any on reactor power and SCRAM functionality. Safety Rod 1 and 2 were raised (reactor not critical), data recorded, then the power to DAS was removed. After DAS was de-energized, channel 1: 150 cps, channel 2: off scale high on meter and chart recorder, channel 3: 33% of 10 mW. SRO noted that reactor did NOT SCRAM when channel 2 indicated off scale high. SRO manually SCRAM reactor, power to DAS was restored and all indications returned to normal. An attempt to perform the pre-operational checks with DAS de-energized was aborted due to channel 1 and 2 indicating abnormally while DAS was de-energized.

Appendix A to Facility Operating License NO. R-110 Technical Specifications for ISU AGN 201 M Reactor (serial NO. 103) Docket NO. 50-284 section 6.9.2 (8) provides the following description of a reportable occurrence:

“Performance of structures, systems, or components that requires remedial action or corrective measures to prevent operation in a manner less conservative than assumed in the the accident analyses in the Safety Analyses Report (SAR) or Technical Specifications basis, or discovery during plant life of conditions not specifically considered in the SAR or Technical Specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition.”

The discovery of conditions not specifically considered int the SAR or Technical Specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition applies to the condition that if DAS is de-energized, an unsafe condition may exist because channel 1 and channel 2 do not indicate reactor power correctly.

I recommend NRC notification of reportable occurrence, notify Reactor Safety Committee and to suspend reactor operations until remedial actions or corrective measures can be determined and implemented.

Sincerely,

Larry Foulkrod

Reactor Supervisor (In Training)