

**REPORT ON THE EFFECTIVENESS OF TRAINING
AT OPERATING POWER REACTORS
FOR CALENDAR YEARS 2018-2021**

May 2022

Enclosure

EXECUTIVE SUMMARY

This report documents a review by the Nuclear Regulatory Commission (NRC) staff of training effectiveness at operating power reactors that are subject to Title 10 of the Code of Federal Regulations (10 CFR) 50.120, "Training and Qualification of Nuclear Power Plant Personnel." This report includes calendar years 2018, 2019, 2020, and 2021. The NRC staff reviewed data from the NRC Reactor Oversight Process (ROP), reported events at operating power reactors, and NRC observations of training and accreditation activities conducted by the Institute of Nuclear Power Operations (INPO).

Based on the results of this review, the NRC staff concludes that operating power reactor operations and technical training programs continue to meet NRC requirements and therefore continue to provide adequate protection of public health and safety.

BACKGROUND

In 10 CFR 50.120, the NRC requires training programs for nine categories of plant personnel to be established, implemented, and maintained using a systems approach to training as defined in 10 CFR 55.4 (SAT). A SAT provides for the systematic determination of job performance and qualification requirements and for periodic retraining of personnel. The requirements in 10 CFR 50.120 complement similar requirements in 10 CFR 55.59 for licensed operator requalification programs.

The NRC staff inspects implementation of the training and qualification requirements for nuclear power plant personnel in the ROP. The NRC staff uses Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program and Licensed Operator Performance," to assess licensed operator continuing (i.e., requalification) training programs. Additionally, as discussed in NRC Inspection Manual Chapter (IMC) 0310, "Aspects within the Cross-Cutting Areas" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19011A360), NRC inspectors assign cross-cutting aspects to inspection findings in accordance with IMC 0612, "Issue Screening" (ADAMS Accession No. ML19214A243). The NRC reviews cross-cutting aspects for cross-cutting themes and potential cross-cutting issues in accordance with IMC 0305, "Operating Reactor Assessment Program" (ADAMS Accession No. ML21092A111), to provide licensees the opportunity to address performance issues before they result in more significant safety concerns. Cross-cutting aspect (CCA) H.9, "Training," is assigned if the organization fails to provide training or fails to ensure knowledge transfer to maintain a knowledgeable and technically competent workforce or fails to instill nuclear safety values.

The INPO National Academy for Nuclear Training (NANT) monitors the implementation of the SAT process at power reactor facilities through periodic training program accreditation reviews conducted by the National Nuclear Accrediting Board (NNAB). The NRC recognizes NANT accreditation as a means of meeting the SAT requirements of 10 CFR 50.120 and 10 CFR 55.59(c). As of the date of this report, all operating nuclear power reactor facilities have training programs that are accredited by the NANT.

The NRC staff monitors INPO accreditation activities as indicators of the overall effectiveness of the industry's use of the SAT process as discussed in the "Memorandum of Agreement Between the Institute of Nuclear Power Operations and the U.S. NRC" (MOA) (ADAMS Accession No. ML20125A374, dated December 20, 2020). This includes observing one INPO-led accreditation

team visit (ATV) and selected accreditation meetings of the NNAB each year.

REVIEW METHODOLOGY

Indications of adequately trained and qualified plant personnel and continued NNAB accreditation provide reasonable assurance that the training of nuclear power plant workers is adequate to maintain public health and safety. Accordingly, the NRC staff reviewed findings identified during implementation of the ROP, event reports prepared by industry, and NRC staff observations of the NNAB accreditation process.

RESULTS

Reactor Oversight Process Insights

Licensed Operator Requalification

From 2018-2021, the NRC conducted over 540 inspections each year of the licensed operator requalification program in accordance with IP 71111.11, the baseline inspection procedure. Issues identified during these inspections included two green findings for failure to maintain exam security during the licensed operator requalification process. Two green findings were identified in 2018 due to high failure rates of specific portions of the licensed operator requalification examination. In both instances, the NRC staff noted that the operators were remediated according to site training procedures. Eight other findings were related to licensed operator medical issues or operator license maintenance. However, these findings are not directly related to operator training effectiveness.

Overall, the results of these inspections indicate that power reactor facilities are satisfactorily maintaining their licensed operator requalification training programs. No adverse trends were identified. Licensees continue to demonstrate their ability to effectively develop and administer licensed operator requalification examinations. Licensee evaluations continue to satisfactorily identify licensed operator performance deficiencies.

Inspection Findings

The number and significance of inspection findings related to CCA H.9 provide an indication of whether plant personnel are adequately trained and qualified. Table 1, "Findings Related to Training and Qualification Deficiencies," shows the total number and percent of NRC inspection findings that were attributed to CCA H.9.

Table 1, Findings Related to Training and Qualification Deficiencies			
Year	Total Number of Findings	Number of Findings Related to H.9	Percent of Findings Related to H.9
2021	278	7	2.5%
2020	291	4	0.7%
2019	440	9	1.9%
2018	478	9	2.33%

All the findings associated with CCA H.9 were of very low safety significance (i.e., Green). As shown in Table 1, the number of inspection findings related to CCA H.9 was relatively small compared to the total number of inspection findings.

Based on these results, NRC staff concluded that there were no notable negative trends in the ROP inspection findings that indicated an adverse trend related to training effectiveness.

Industry Events

The NRC staff reviewed event reports prepared by industry. The percentage of events that were determined to be related to issues with training and/or qualifications was relatively low compared to other causal factors reported. The few issues that were reported were related to inadequately trained workers or inadequate training content.

NRC Observations of the Accreditation Process

NRC staff observed the following ATVs:

- In 2021, Sequoyah Operations
- In 2020, Susquehanna Operations
- In 2019, Nine Mile Point Operations
- In 2018, Brunswick Operations

NRC staff observed the following NNAB meetings:

- In 2021, 20 of 22 NNABs
- In 2020, 22 of 22 NNABs
- In 2019, 16 of 16 NNABs
- In 2018, 24 of 24 NNABs

NRC observers provided feedback on these ATVs and NNAB meetings. In general, NRC observers noted that the NNAB was thorough in their questions and challenges. In addition, the NRC observers noted that the NNAB had enough information to make decisions, and there was diversity of NNAB member expertise.

The following are the results of the NNABs:

- In 2021, all licensees had their accreditation renewed.
- In 2020, all licensees had their accreditation renewed.
- In 2019, all licensees had their accreditation renewed.
- In 2018, all licensees except one had their accreditation renewed. One licensee was placed on probation. A post-probation NNAB was held later that year, and accreditation was renewed.

CONCLUSIONS

The NRC staff documented a relatively small number of issues related to training weaknesses at operating power reactors, which were all very low safety significance, in the implementation of the ROP. The event reports prepared by industry also showed that weaknesses in the training and qualification of plant personnel contributed to a relatively small percentage of all reported events. NRC observations of the INPO-managed accreditation process continued to provide confidence that accreditation is an acceptable means of ensuring the requirements for a SAT contained in 10 CFR 50.120 and 10 CFR Part 55 are being met. In addition, the NRC's

assessment of the accreditation process indicates that renewed accreditation of facility training programs remains a reliable indicator of successful implementation of a SAT and contributes to the assurance of public health and safety by ensuring that nuclear power plant workers are being adequately trained and qualified.