



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 15, 2018

Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P. O. Box 1295, Bin 038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2 – PROPOSED
ALTERNATIVE RR-V-11, EXTENSION OF MAIN STEAM SAFETY RELIEF
VALVE TEST INTERVAL (CAC NO. MG0071, EPID L-2017-LLR-0075)

Dear Ms. Gayheart:

By letter dated August 3, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17215A558), supplemented by letters dated March 29, 2018 (ADAMS Accession No. ML18088A080), April 17, 2018 (ADAMS Accession No. ML18107A515), and May 10, 2018 (ADAMS Accession No. ML18130A937), Southern Nuclear Operating Company (SNC) submitted alternative request RR-V-11 to the U.S. Nuclear Regulatory Commission (NRC). SNC proposed an alternative to certain inservice testing requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), for the Edwin I. Hatch Nuclear Plant (HNP), Unit No. 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(z)(2), SNC requested to extend the test interval for certain main steam safety relief valves (SRVs) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff has completed its review of request for alternative RR-V-11. As described in the enclosed safety evaluation, the NRC staff has determined that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Accordingly, the NRC staff concludes that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the NRC staff authorizes the use of alternative RR-V-11 at HNP Unit No. 2. The subject alternative is authorized on a one-time basis, allowing SNC to delay the required SRV tests until the spring 2019 refueling outage, an extension of approximately 4 months beyond the Code allowed 30 month test interval.

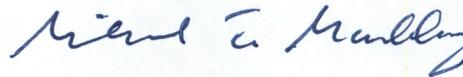
C. Gayheart

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All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject request remain applicable.

If you have any questions, please contact the Project Manager, Randy Hall, at 301-415-4032 or by e-mail at Randy.Hall@nrc.gov.

Sincerely,



Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-366

Enclosure:
Safety Evaluation

cc: via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ALTERNATIVE RR-V-11

ONE-TIME EXTENSION OF MAIN STEAM SAFETY RELIEF VALVE TEST INTERVAL

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2

SOUTHERN NUCLEAR OPERATING COMPANY

DOCKET NO. 50-366

1.0 INTRODUCTION

By letter dated August 3, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17215A558), supplemented by letters dated March 29, 2018 (ADAMS Accession No. ML18088A080), April 17, 2018 (ADAMS Accession No. ML18107A515), and May 10, 2018 (ADAMS Accession No. ML18130A937), Southern Nuclear Operating Company (SNC, or the licensee) submitted alternative request RR-V-11 to the U.S. Nuclear Regulatory Commission (NRC). SNC proposed an alternative to certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), for the Edwin I. Hatch Nuclear Plant (HNP), Unit No. 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(z)(2), SNC requested to extend the test interval for certain main steam safety relief valves (SRVs) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(f), state, in part, that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with the specified ASME OM Code and applicable addenda incorporated by reference in the regulations.

The regulations in 10 CFR 50.55a(z) state, in part, that alternatives to the requirements of 10 CFR 50.55a may be used, when authorized by the NRC, if the licensee demonstrates that: (1) the proposed alternative would provide an acceptable level of quality and safety; or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Alternative Request RR-V-11

The licensee requested an alternative to the relief valve testing requirement of the ASME OM Code.

Mandatory Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants," I-1320, "Test Frequencies, Class 1 Pressure Relief Valves," paragraph (a), "5-Year Test Interval," states, "Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20 percent of the valves from each valve group shall be tested within any 24-month interval. This 20 percent shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years."

The licensee has requested to use the proposed alternative described below for the Target Rock Model 0867F 3-Stage Main Steam SRVs listed in Table 1.

Table 1

| Valve | Description | ASME Class | Unit |
|------------|----------------|------------|------|
| 2B21-F013A | Main Steam SRV | 1 | 2 |
| 2B21-F013B | Main Steam SRV | 1 | 2 |
| 2B21-F013C | Main Steam SRV | 1 | 2 |
| 2B21-F013D | Main Steam SRV | 1 | 2 |
| 2B21-F013E | Main Steam SRV | 1 | 2 |
| 2B21-F013F | Main Steam SRV | 1 | 2 |
| 2B21-F013G | Main Steam SRV | 1 | 2 |
| 2B21-F013H | Main Steam SRV | 1 | 2 |
| 2B21-F013K | Main Steam SRV | 1 | 2 |
| 2B21-F013L | Main Steam SRV | 1 | 2 |
| 2B21-F013M | Main Steam SRV | 1 | 2 |

The HNP Unit No. 2 fifth 10-year IST program interval began on January 1, 2016, and is scheduled to end on December 31, 2025. The applicable ASME OM Code edition and addenda for the HNP Unit No. 2 fifth 10-year IST program interval are the 2004 Edition through 2006 Addenda.

Reason for Request

In the request for alternative dated August 3, 2017, the licensee stated:

All Hatch Unit 2 safety relief valve (SRV) main valve bodies (MVBs) were replaced with pre-tested components during a forced outage in May 2016. This replacement was required to address Part 21 Report, *Notification of a Defect, Potential for Test Induced Damage, 0867F Series Main Steam Safety Relief Valves*.

In the supplement dated March 29, 2018, the licensee stated:

The Hatch Unit 2 MVBs removed from service during the forced outage in May 2016 were sent to NTS in Huntsville, Alabama. The MVBs were not as-found tested to preserve evidence and not introduce new damage from as-found limited flow testing. Based on disassembly and inspection results of the Hatch Unit 2 MVBs, no evidence was present to suggest that any of the eleven MVBs would not have passed as-found testing, and the MVBs fully stroked on the test stand. Although the jam nuts were found loose and deformation was present on the MVB disc stems, the de-shouldering between the disc and the piston did not meet the threshold requirements of 0.004 inches that would allow rocking of the piston while in service.

In the request for alternative dated August 3, 2017, the licensee also stated:

No SRV main bodies were replaced with pre-tested valves during the Unit 2 February 2017 refueling outage. The next opportunity to replace the Unit 2 SRV main bodies during a scheduled refueling outage will be in February 2019. This will result in the SRV main body test frequency exceeding the 20% in 24-month requirement by less than one year.

100% of the SRV pilot valves were replaced with pre-tested valves in the February 2017 refueling outage, so they will continue to meet all ASME OM Code test requirements.

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraph (z)(2), relief is requested from the frequency specifications of the ASME OM Code. The basis for this relief request is the Code requirement presents an undue hardship without a compensating increase in the level of quality or safety.

Proposed Alternative

In the request for alternative dated August 3, 2017, the licensee stated:

SNC requests approval for a one-time extension of the SRV main valve body code surveillance from the 20% test frequency. The SRV main body and pilot valves will continue to meet the 100% 5-year test frequency requirement.

This relief request is for a short duration. During any 24-month period, the OM Code requires a minimum of 20% (3 of 11) SRV main bodies to be tested. HNP relief request RRV- 8 allows the specified time between surveillances to be extended by up to 25% (6 months) resulting in a 30-month maximum time between tests. This relief request will extend the maximum time between surveillances by approximately 4 months.

Meeting the OM Code 20% test minimum requirement would result in 6 SRV main valve bodies being tested during the time frame in question. HNP Unit 2 replaced all 11 (100%) of their SRV main bodies in May 2016.

In its supplement dated March 29, 2018, the licensee stated:

The MVBs installed were tested with the limited flow testing and then disassembled and inspected per the Part 21 inspection (TRFS-406 Rev. B). This inspection found no abnormal wear or deformation. Some main disc jam nuts were found loose, but still within tolerance. These jam nuts were tightened per procedure with the locking tab. Since the pressure boundary was broken for inspection, the valves were hydro tested to confirm no leakage was introduced. This post-test inspection confirmed that valves currently installed on Unit 2 have tight locking nuts and tabs, as well as no deformation on the main disc shoulder. The valves have not been lifted since the Part 21 inspection was completed.

In the request for alternative dated August 3, 2017, the licensee also stated:

During the spring 2019 Unit 2 refueling outage, HNP is scheduled to replace 6 SRV main bodies.

100% of the SRV pilot valves were replaced with pre-tested valves in February 2017. HNP Unit 2 is scheduled to replace 100% of the SRV pilot valves during the February 2019 refueling outage. This testing frequency far exceeds the OM Code requirements.

The 0867F 3-stage SRVs were initially installed during the spring 2011 Unit 2 refueling outage, and have experienced no operational failures.

In its supplement dated April 17, 2018, the licensee stated:

Five MVBs removed from Hatch Unit 1 during the February 2018 refueling outage were tested at the NWS Technologies laboratory. Previously, a Part 21 notification issued by Target Rock identified damage to MVBs caused by limited flow testing at operating pressure. In response, corrective measures were implemented. These corrective measures included: 1) augmented as-left inspections to verify/correct the torque on the main disc retaining nut and ring before installing the valves in the plant and 2) dropping test pressure to 400 psi with full flow during as-left and as-found testing. The inspection results and as-found testing after two years in service showed no deformation or loosening of the main disc retaining nut. All five valves were as-found tested using the improved MVB low pressure (400 psi) test, and then disassembled satisfactorily, with no loose jam nuts or retaining rings.

In its supplement dated May 10, 2018, the licensee stated:

The low pressure safety relief valve (SRV) main valve body (MVB) test was developed in conjunction with NWS Technologies. The 400 psig actuation requirement was developed through full flow (ungagged) tests at various incremental pressures starting at 50 psig and increasing up to 400 psig. During each test at incremental pressures, MVB disc stroke/travel was measured using the test stand linear variable differential transformer (LVDT). With pressure removed, the MVB was also stroked by hand to validate travel. The goal was to validate full stroke of the MVB disc (2.78-inch or greater) at the lowest pressure while eliminating rapid cycling of the disc. This goal was achieved consistently at

400 psig. At pressures lower than 400 psig, the MVB disc would open but would either not consistently achieve full stroke or have rapid cycling following the initial stroke. These results have been replicated during 400 psig MVB testing in 2018.

In its supplement dated April 17, 2018, the licensee also stated:

The test results support the improved low-pressure testing method as a solution to the Part 21 notification. The Unit 2 valves currently installed were as-left tested and inspected with the same methodology and standards used on the five MVBs removed during the February 2018 refueling outage and found in NWS procedure NWS-T-91 R5 TR3.

In its supplement dated March 29, 2018, the licensee also stated:

The valves have not been lifted since installation. No valves in either Unit have been stroked online/in-service since implementation of the 3-stage Target Rock design.

Lastly, in its supplement dated April 17, 2018, the licensee also stated:

Plant Hatch has reasonable confidence that the valves currently installed and Part 21 inspected have no issues. The same testing method and inspection criteria will continue to be applied for all future rebuilds.

3.2 NRC Staff Evaluation

Paragraph I-1320 of Mandatory Appendix I to the ASME OM Code requires that Class 1 pressure relief valves be tested at least once every five years. A minimum of 20 percent of the valves from each valve group shall be tested within any 24-month interval. The 20 percent shall consist of valves that have not been tested during the current five year interval. The test interval for any individual valve shall not exceed five years.

All 11 of the SRV MVBs at Hatch Unit 2 were replaced with pre-tested MVBs during a forced outage in May 2016, which was required to address the Part 21 Report mentioned above. The licensee did not replace any SRV MVBs with pre-tested valves during the February 2017 refueling outage. The licensee stated that the next opportunity to replace the SRV MVBs is during the refueling outage in February 2019, and is requesting an alternative to extend the test interval until the outage. The maximum interval allowed by the ASME OM Code between testing is 24 months, plus a six month grace period, which would be 30 months. The time between testing, according to the licensee, will be approximately 34 months, which is four months longer than the ASME OM Code allowed test frequency plus grace period. The licensee stated that complying with the ASME OM Code required test interval of 30 months would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. This is because the unit would have to be shut down to replace the SRVs.

Target Rock had issued the Part 21 notification mentioned above that identified that limited flow testing at operating pressure caused damage to MVBs. The licensee, in conjunction with NWS Technologies, developed a full flow (ungagged) low pressure test for the MVBs. It was determined that 400 psig was the lowest pressure where the full stroke of the MVB could be validated while also eliminating the rapid cycling of the disc.

Limited flow testing was performed on the Unit 2 MVBs installed during the May 2016 forced outage. After the test, they were disassembled and inspected per the Part 21 inspection guidance, and no abnormal wear or deformation was found.

Five MVBs were removed from HNP Unit 1 in February 2018. The licensee had implemented the Target Rock corrective measures described above for these MVBs, prior to their installation in Unit 1, and they were full-flow tested at 400 psig during as-found and as-left testing. When they were removed in February 2018, they were as-found tested at full flow at 400 psig. They were disassembled and no damage was found after approximately two years of being installed in the plant.

In summary, the five Unit 1 MVBs that had the Target Rock corrective measures implemented were tested using the low pressure full flow test and were in operation for two years without any damage. All 11 of the Unit 2 MVBs, which were installed in May 2016, had the Target Rock corrective measures implemented and have also been tested using the low pressure full flow test. Finally, none of the SRVs currently installed in either unit have been stroked online/in-service since the implementation of the 3-stage Target Rock design. Based on these facts, the NRC staff finds that the Target Rock corrective actions and modified testing provide reasonable assurance of the operational readiness of the Hatch Unit 2 SRVs for an additional four months, and that compliance with the specified ASME OM Code requirement would result in a hardship without a compensating increase in the level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff determined that for alternative request RR-V-11 for HNP Unit No. 2, the proposed alternative provides reasonable assurance that the affected components are operationally ready. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2) for request RR V 11. The subject alternative request is a one-time request to delay the tests until the spring 2019 refueling outage, a period of approximately 34 months, or approximately 4 months beyond the Code-allowed 30 months. Therefore, the NRC staff authorizes the use of alternative RR-V-11 for HNP Unit No. 2 during the fifth 10-year interval of the IST program at HNP Unit No. 2. The fifth 10-year IST program interval for HNP Unit No. 2 began on January 1, 2016 and is scheduled to end on December 31, 2025.

All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests remain applicable.

Principal Contributor: R. Wolfgang, NRR

Date: June 15, 2018

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2 – PROPOSED
ALTERNATIVE RR-V-11, EXTENSION OF MAIN STEAM SAFETY RELIEF
VALVE TEST INTERVAL (CAC NO. MG0071, EPID L-2017-LLR-0075) DATED
JUNE 15, 2018

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