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A Duke Energy Company

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March 22, 2004

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
Proposed Technical Specifications Amendments
3.3.2, Engineered Safety Feature Actuation System Instrumentation
3.3.6, Containment Air Release and Addition Isolation Instrumentation

In accordance with the provisions of 10 CFR 50.90, Duke Energy Corporation proposes to revise the Catawba Nuclear Station Facility Operating Licenses and Technical Specifications (TS) to change the surveillance frequency on selected Engineered Safety Features Actuation System (ESFAS) slave relays from 92 days to 18 months.

The test frequency relaxation applies for selected slave relays based on the NRC Safety Evaluation Reports contained in WCAP-13877 Revision 2-P-A for Westinghouse Type AR relays and WCAP-13878-P-A Revision 2 for Potter and Brumfield MDR Series Relays.

The requested relaxation will result in reduced maintenance testing person-hours and reduced probability of inadvertent plant trips and transients. This results in a safety improvement and a substantial cost savings over the remaining life of the units.

The proposed change to the slave relay test involves tests that are performed every 92 days. Catawba will implement the proposed changes for slave relay testing within 3 months following NRC approval. Duke Energy Corporation requests approval of the proposed changes by October 31, 2004.

The contents of this amendment request package are as follows:

Attachment 1 provides marked copies of the affected TS and Bases pages for Catawba, showing the proposed changes. Attachment 2 is

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a placeholder for reprinted pages of the affected TS and Bases pages for Catawba. The reprinted pages will be provided to the NRC following the completion of the technical review of this proposed amendment. Attachment 3 provides a description of the proposed changes and technical justification. Pursuant to 10 CFR 50.92, Attachment 4 documents the determination that the amendment contains No Significant Hazards Considerations. Pursuant to 10 CFR 51.22(c)(9), Attachment 5 provides the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement.

Implementation of this amendment to the Catawba Facility Operating Licenses and TS will not impact the Catawba Updated Final Safety Analysis Report (UFSAR).

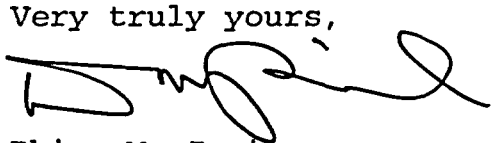
In accordance with Duke Energy Corporation administrative procedures and the Quality Assurance Program Topical Report, this proposed amendment has been previously reviewed and approved by the Catawba Plant Operations Review Committee and the Duke Energy Corporation Nuclear Safety Review Board.

There are no regulatory commitments contained in this letter or its attachments.

Pursuant to 10 CFR 50.91, a copy of this proposed amendment is being sent to the appropriate state official.

Inquiries on this matter should be directed to L.J. Rudy at (803) 831-3084.

Very truly yours,



Dhiaa M. Jamil

LJR/s

Attachments

Dhiaa M. Jamil, affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Dhiaa M. Jamil, Vice President

Subscribed and sworn to me: 3/22/2004
Date

Notary Public

My commission expires: 7/10/2012
Date

SEAL

xc (with attachments):

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ATTACHMENT 1

MARKED-UP TECHNICAL SPECIFICATIONS AND BASES PAGES FOR CATAWBA

SURVEILLANCE REQUIREMENTS

NOTE
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.3	NOTE Final actuation of pumps or valves not required. Perform TADOT.	31 days
SR 3.3.2.4	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.5	Perform COT.	92 days
SR 3.3.2.6	Perform SLAVE RELAY TEST.	92 days
SR 3.3.2.7	Perform COT.	31 days

(continued)

OR

18 months for only Westinghouse AR and Potter & Brumfield MDR relay types

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Air Release and Addition Isolation Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.2	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.3	Perform SLAVE RELAY TEST.	92 days
SR 3.3.6.4	----------NOTE---------- Verification of setpoint is not required. --- Perform TADOT.	18 months

OR

18 months for only Westinghouse AR and Potter & Brumfield MDR relay types

SURVEILLANCE REQUIREMENTS (continued)

The setpoint shall be left set consistent with the assumptions of the setpoint methodology.

The Frequency of 92 days is justified in Reference 7.

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every 92 days. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data.

INSERT 1 →

SR 3.3.2.7

SR 3.3.2.7 is the performance of a COT on the RWST level and Containment Pressure Control Start and Terminate Permissives.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. This test is performed every 31 days. The Frequency is adequate, based on operating experience, considering instrument reliability and operating history data.

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions, AFW pump start on trip of all MFW pumps, AFW low suction pressure, Reactor Trip (P-4) Interlock, and Doghouse Water Level - High High Feedwater Isolation. It is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 7.

3. UFSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

7. WCAP-10271-P-A, Supplement 1 and Supplement 2, Rev. 1, May 1986 and June 1990.

8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" Sep., 1995.

9. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" Oct., 1998.

10. WCAP - 13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994.

11. WCAP - 13877 Revision 2 - P - A, "Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays," August 2000.

12. WCAP - 13878 - P - A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which containment air release and addition isolation Functions.

(1)

SR 3.3.6.1

SR 3.3.6.1 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.

SR 3.3.6.2

SR 3.3.6.2 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.

SR 3.3.6.3

SR 3.3.6.3 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every 92 days. The Frequency is acceptable based on instrument reliability and industry operating experience.

INSERT 2 →

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.4

SR 3.3.6.4 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

The test also includes trip devices that provide actuation signals directly to the SSPS, bypassing the analog process control equipment. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.

REFERENCES

1. 10 CFR 100.11.
2. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
3. WCAP - 13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994.
4. WCAP - 13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays," August 2000.
5. WCAP - 13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

INSERT 1

For slave relays or any auxiliary relays in the ESFAS circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST is performed every 18 months. This test frequency is based on the relay reliability assessments presented in References 10, 11, and 12. These reliability assessments are relay specific and apply only to the Westinghouse AR and Potter & Brumfield MDR type relays. SSPS slave relays or any auxiliary relays not addressed by Reference 10 do not qualify for extended surveillance intervals and will continue to be tested at a 92 day Frequency.

INSERT 2

For slave relays or any auxiliary relays in the circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST is performed every 18 months. This test frequency is based on the relay reliability assessments presented in References 3, 4, and 5. These reliability assessments are relay specific and apply only to the Westinghouse AR and Potter & Brumfield MDR type relays. SSPS slave relays or any auxiliary relays not addressed by Reference 3 do not qualify for extended surveillance intervals and will continue to be tested at a 92 day Frequency.

ATTACHMENT 2

REPRINTED TECHNICAL SPECIFICATIONS AND BASES PAGES FOR CATAWBA (TO BE PROVIDED TO NRC FOLLOWING COMPLETION OF TECHNICAL REVIEW)

ATTACHMENT 3

DESCRIPTION OF PROPOSED CHANGES AND TECHNICAL JUSTIFICATION

Background

Generic Letter (GL) 93-05, "Line Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation," was approved in September 1993. This GL is the result of recommendations from a 1983 NRC task group formed to investigate problems with surveillance testing required by TS. The objectives of the NRC task group were: 1) to review the basis for test frequencies; 2) to ensure that the tests promote safety and do not degrade equipment; and 3) to review surveillance tests for unnecessary burden on plant personnel. The studies found that while some testing at power is essential to verify equipment and system operability, safety can be improved, equipment degradation decreased, and unnecessary personnel burden relaxed by reducing the amount of testing at power. The relaxation of the slave relay test frequency is consistent with the objectives of the NRC task group. The relaxation in surveillance frequency for the ESFAS slave relays involves two different relays. The relays are the Westinghouse Type AR Relays and the Potter & Brumfield MDR Series Relays. Each of the relays is discussed separately.

Proposed Change for Westinghouse Type AR Relays

The current Catawba TS require slave relay tests to be performed at a frequency of 92 days. The proposed change would revise the Catawba TS to change the surveillance frequency for Westinghouse Type AR relays, as used in ESFAS applications, from quarterly to 18 months. The TS change applies only to Westinghouse Type AR relays identified in WCAP-13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays."

Basis for Proposed Change for Westinghouse Type AR Relays

WCAP-13877 Revision 2-P-A contains the technical basis and methodology for revising the surveillance frequency for Westinghouse Type AR relays identified in the WCAP and used in ESFAS applications. The NRC safety evaluation for WCAP-13877 Revision 2-P-A requires confirmation by licensees that the generic analysis in the WCAP is applicable to their plant.

Duke Energy Corporation has reviewed the plant data for Catawba Units 1 and 2. The following Westinghouse Type AR relays that are currently or may be installed at the units are those that are bounded by the generic analysis contained in WCAP-13877 Revision 2-P-A.

- Westinghouse Type AR440
- Westinghouse Type AR880

In addition to the Safety Evaluation Report included in the WCAP-13877 Revision 2-P-A, the NRC requires licensees to take the following actions:

(a) Confirm the applicability of the WCAP-13877 Revision 2-P-A analyses to Catawba.

Response
Catawba Units 1 and 2 use Type AR440 and AR880 relays for ESF actuations or in some cases as interposing relays. These relays are bounded by WCAP-13877 Revision 2-P-A and have environmental conditions similar to those in the WCAP.

(b) Ensure that the contact loading analysis for the Type AR relays have been performed to determine the acceptability of these relays.

Response
For the Type AR relays used in ESF actuations or as interposing relays, Duke Energy Corporation has performed a contact loading analysis for these relays and the analysis concluded that the ESF slave relay contacts are adequate for their applications and will not be subjected to long term degradation.

(c) Determine the qualified life for the Type AR relays based on plant-specific environmental conditions.

Response
Catawba's Type AR ESF relays are subjected to environmental conditions comparable to those evaluated in WCAP-13877 Revision 2-P-A. Therefore, the conclusions of the WCAP regarding qualified life for these relays are directly applicable to Catawba. Catawba has no plant-specific environmental conditions that are not bounded by the WCAP evaluation.

(d) Establish a program to evaluate the adequacy of the proposed test interval if two or more AR relays fail in a 12-month period.

Response
If two or more of the Type AR relays used in ESF or interposing relay applications fail in a 12-month period, Duke Energy Corporation will evaluate and continue to

monitor the adequacy of the proposed surveillance test interval relaxation. The design, maintenance, and testing of all Type AR relays used in ESF and interposing relay applications will be reevaluated. The Maintenance Rule program implements the requirements of 10 CFR 50.65 and provides instructions for initiation, analysis, retrieval, trending, and periodic reporting of data relative to performance indicators of plant systems and components. The program includes guidance for trending and reporting of repetitive preventable failures of functions which are within the scope of the Maintenance Rule. It also includes performance of cause determinations for failures to meet performance criteria and for repetitive failures. The program assigns plant engineers responsibility for identifying when performance criteria are not met and increased monitoring under the Maintenance Rule is required, along with the corrective actions necessary to restore acceptable performance. Corrective actions are based on the identified causes and may include increased surveillance. The functions performed by these relays are within the scope of this program. Provisions for evaluating the adequacy of the proposed test interval are captured in engineering support documentation for the Solid State Protection System and are implemented via the Catawba corrective action program.

Some slave relay testing results in actuation of ESF equipment. These actuations have caused plant transients at other plants, such as inadvertent ESF actuations and reactor trips. Relaxing the frequency of slave relay testing from quarterly to 18 months will minimize the risks associated with unnecessary ESF actuations or reactor trips. Performance of some slave relay testing requires that associated safety systems be removed from service. Relaxing the surveillance interval reduces the frequency that safety systems will be removed from service and, therefore, increases their availability to perform their required safety functions. This results in a reduction in risk. A reduction in slave relay testing frequency will also be cost beneficial by reducing the burden on the plant operations, maintenance, and engineering staff.

Westinghouse performed an evaluation to determine the reliability of the Westinghouse Type AR relays used to actuate ESF components. The evaluation documented in WCAP-13877 Revision 2-P-A includes: 1) a generic review of industry information on relay problems; 2) a slave relay surveillance test failure study; 3) a failure modes and effects analysis (FMEA); and 4) an aging assessment. A summary of the evaluation is presented below.

A review of NRC documents, such as Information Notices, Circulars, and Bulletins, and Westinghouse technical bulletins associated with relays was performed to identify potential relay failure modes and mechanisms. The issues identified and considered in the analysis included performance of potting materials and lubricants, contact block assembly binding, excessive loading of relay contacts, insufficient contact travel, latch attachment seismic qualification, and material degradation. The results of this review and the documents reviewed are documented in Section 6 of WCAP-13877 Revision 2-P-A.

To identify potential relay failure modes, data regarding the failure of slave relays was collected from the Nuclear Plant Reliability Database System and supplemented with survey information on slave relay failures from Westinghouse designed plants. The data indicates a higher reliability than that assumed by IEEE 500, "Guide to the Collection and Presentation of Electrical, Sensing Component, and Mechanical Equipment Reliability Data for Nuclear Power Generating Stations." Details of the failure experience review are provided in Section 9 of WCAP-13877 Revision 2-P-A.

FMEAs were performed for the AR relays. The FMEAs considered the design and design history of the relays, failure modes and mechanisms based on failure history, materials performance data, and included input from design and manufacturing engineers. The FMEAs were performed based on guidance in IEEE 352-1987, "IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems." Based on the results of the FMEAs, aging assessments were performed to determine the effects of thermal aging and out-gassing on slave relay reliability. The details of the FMEAs are included in Section 3, 7, and 8 of WCAP-13877 Revision 2-P-A.

Continuously energized coils experience significant self-heating, resulting in accelerated age/temperature dependent degradation of components used in the relays. Actual temperature rises are dependent on relay sub-component location with respect to the coil and the ambient temperature. Since no actual failures of Type AR AC relay coils were identified, the life expectancy determination was conservatively based on failure data for DC coil relays (Type ARD). To identify the Type AR relay materials most susceptible to temperature accelerated aging and most likely to out-gas, available thermogravimetric analyses (TGA) applicable to temperature sensitive materials used in the construction of Type AR relays were reviewed. A detailed

evaluation of the thermogravimetric analysis for the Type AR relay components is included in Section 8 of WCAP-13877 Revision 2-P-A.

Westinghouse Type AR relays used as normally deenergized ESFAS slave relays will not experience temperature induced, age related degradation sufficient to result in failure within the 40-year plant life. Degradation of critical components requires substantial time and would result in no perceptible change in relay performance. Degradation of non-critical components will have no adverse impact on relay performance or reliability. Type AR relays used as normally energized ESFAS slave relays will experience temperature induced, age related degradation sufficient to result in failure within the 40-year plant life and, therefore, should be replaced periodically dependent on temperature data specific to the location in the plant. Although no actual failures of Type AR AC relay coils were identified, the life expectancy was conservatively determined based on failure data from Type ARD DC coil relays. With replacement at a conservative interval, normally energized Type AR relays will exhibit the same reliability as normally deenergized relays. Catawba does not utilize this relay type in normally energized applications. Therefore, based upon the results of the aging assessment, the probability of a relay malfunctioning or the reliability of slave relays decreasing as a result of an 18-month frequency is low.

Since interposing relays can affect the ultimate function of the slave relay to start the required equipment, interposing relay reliability must be comparable to that of the associated slave relay. All of the slave relays and their actuated devices were evaluated for the presence of interposing relays. The majority of slave relays directly actuate ESF equipment, although some slave relays actuate a combination of equipment both directly and via interposing relays. Testing on an 18-month frequency is adequate to confirm reliability and continuing operability of the Type AR relays, subject to service life limitations of normally energized relays, based on the results of WCAP-13877 Revision 2-P-A. Interposing relays which are not Type AR will continue to be tested every 92 days, where applicable.

Conclusions for Westinghouse Type AR Relays

The slave relay reliability study verified that Westinghouse Type AR relays are highly reliable. The aging assessment concludes that the degradation of normally deenergized and normally energized relays is sufficiently slow that an 18-month frequency surveillance interval will adequately

identify relay failures. The aging assessment also demonstrates that normally deenergized relays can be expected to operate reliably over their service life. Catawba does not utilize this relay type in normally energized applications.

Testing on an 18-month frequency is also adequate to confirm reliability and continuing operability of interposing relays which are Westinghouse Type AR relays. Relays which are not Westinghouse Type AR will continue to be tested every 92 days, where applicable.

Based on the above evaluation, Duke Energy Corporation concludes that there is reasonable assurance that the health and safety of the public will not be affected by the proposed changes.

Proposed Change for Potter & Brumfield MDR Series Relays

The current Catawba TS require slave relay tests to be performed at a frequency of 92 days. The proposed change would revise the Catawba TS to change the surveillance frequency for P&B MDR relays, as used in ESFAS applications, from quarterly to 18 months. The TS change applies only to P&B MDR relays identified in WCAP-13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays."

Basis for Proposed Change for Potter & Brumfield MDR Series Relays

WCAP-13878-P-A Revision 2 contains the technical basis and methodology for revising the surveillance frequency for P&B MDR relays identified in the WCAP and used in ESF applications. The NRC safety evaluation for WCAP-13878-P-A Revision 2 requires confirmation by licensees that the generic analysis in the WCAP is applicable to their plant.

Duke Energy Corporation has reviewed the plant data for Catawba Units 1 and 2. The following Potter & Brumfield MDR relays that are currently or may be installed at the units are those that are bounded by the generic analysis contained in WCAP-13878-P-A Revision 2.

- Potter & Brumfield MDR Model 4103-1, non-latching with a 118 VAC coil
- Potter & Brumfield MDR Model 4121-1, latching with a 118 VAC coil

In addition to the Safety Evaluation Report included in WCAP-13878-P-A Revision 2, the NRC requires licensees to take the following actions:

(a) Confirm the applicability of the WCAP-13878-P-A Revision 2 analyses to Catawba.

Response
Catawba Units 1 and 2 use P&B Model 4121-1 relays in ESFAS applications or as interposing relays. These relays are bounded by WCAP-13878-P-A Revision 2 and have environmental conditions similar to those in the WCAP.

(b) Ensure that the procurement program for Potter & Brumfield MDR relays is adequate for detecting the types of failures that are discussed in References 9, 10, 11, and 12 of the SER for WCAP-13878-P-A Revision 2.

Response
Duke Energy Corporation has ensured that the procurement program for these relays meets this requirement.

(c) Ensure that all pre-1992 Potter & Brumfield MDR relays which are used in either normally energized or a 20% duty cycle have been removed from ESFAS applications.

Response
Catawba has a small population of the MDR relays. None of these relays is either normally energized or has a 20% duty cycle.

(d) Ensure that the contact loading analysis for the Potter & Brumfield MDR relays has been performed to determine the acceptability of these relays for their application.

Response
For the P&B MDR ESF relays, Duke Energy Corporation has performed a contact loading analysis for the P&B MDR relays which are subject to the TS slave relay test surveillance requirement. The analysis concluded that the ESF slave relay contacts are adequate for their applications and will not be subjected to long term degradation.

(e) Reevaluate the adequacy of the extended surveillance interval if two or more P&B MDR ESFAS relays fail in a 12-month period. The reevaluation should consider design, maintenance, and testing of all P&B MDR ESF

relays.

Response

If two or more of the P&B MDR ESF relays fail in a 12-month period, Duke Energy Corporation will evaluate and continue to monitor the adequacy of the proposed surveillance test interval relaxation. The design, maintenance, and testing of all P&B MDR ESFAS relays will be reevaluated. The Maintenance Rule program implements the requirements of 10 CFR 50.65 and provides instructions for initiation, analysis, retrieval, trending, and periodic reporting of data relative to performance indicators of plant systems and components. The program includes guidance for trending and reporting of repetitive preventable failures of functions which are within the scope of the Maintenance Rule. It also includes performance of cause determinations for failures to meet performance criteria and for repetitive failures. The program assigns plant engineers responsibility for identifying when performance criteria are not met and increased monitoring under the Maintenance Rule is required, along with the corrective actions necessary to restore acceptable performance. Corrective actions are based on the identified causes and may include increased surveillance. The functions performed by these relays are within the scope of this program. Provisions for evaluating the adequacy of the proposed test interval are captured in engineering support documentation for the Solid State Protection System and are implemented via the Catawba corrective action program.

Some slave relay testing results in actuation of ESF equipment. These actuations have caused plant transients at other plants, such as inadvertent ESF actuations and reactor trips. Relaxing the frequency of slave relay testing from quarterly to 18 months will minimize the risks associated with unnecessary ESF actuations or reactor trips. Performance of some slave relay testing requires that associated safety systems be removed from service. Relaxing the surveillance interval reduces the frequency that safety systems will be removed from service and, therefore, increases their availability to perform their required safety functions. This results in a reduction in risk. A reduction in slave relay testing frequency will also be cost beneficial by reducing the burden on the plant operations, maintenance, and engineering staff.

Westinghouse performed an evaluation to determine the reliability of the P&B MDR ESFAS relays. The evaluation documented in WCAP-13878-P-A Revision 2 includes: 1) a generic review of industry information on relay problems; 2)

a slave relay surveillance test failure study; 3) a failure modes and effects analysis (FMEA); and 4) an aging assessment. A summary of the evaluation is presented below.

A review of NRC documents, such as Generic Letters, Information Notices, Office for Analysis and Evaluation of Operational Data Reports, and Westinghouse technical bulletins associated with relays was performed to identify potential relay failure modes and mechanisms. The considerations for the analysis included seismic qualification, service life, material degradation, substandard refurbishment of relays, and excessive loading of relay contacts. The results of this review and the documents reviewed are documented in Section 6 of WCAP-13878-P-A Revision 2.

To identify potential relay failure modes, data regarding the failure of slave relays was collected from the Nuclear Plant Reliability Database System and supplemented with survey information on slave relay failures from Westinghouse designed plants. The data indicates a higher reliability than that assumed by IEEE 500, "Guide to the Collection and Presentation of Electrical, Sensing Component, and Mechanical Equipment Reliability Data for Nuclear Power Generating Stations." Details of the failure experience review are provided in Sections 3 and 9 of WCAP-13878-P-A Revision 2.

FMEAs were performed for the P&B MDR relays. The FMEAs considered the design and design history of the relays, and included input from design and manufacturing engineers. The FMEAs were performed based on guidance in IEEE 352-1987, "IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems." Based on the results of the FMEA, aging assessments were performed to determine the effects of thermal aging and out-gassing on slave relay reliability. The details of the FMEA are included in Section 3 and 7 of WCAP-13878-P-A Revision 2.

Premature failures of P&B MDR series relays have been caused by continuous energization of the coils. The temperature rise is dependent on ambient temperature, coil wattage, and the voltage applied to the coil. Failures of the P&B MDR relays have been most evident in normally energized DC coil relay applications. Accelerated degradation due to coil temperature rise has not been identified in the normally deenergized AC P&B MDR relays in use at Catawba Units 1 and 2. To identify the P&B MDR relay materials most susceptible to temperature accelerated aging and most likely to out-gas, available thermogravimetric analyses (TGA) applicable to

temperature sensitive materials used in the construction of P&B MDR relays were reviewed. A detailed evaluation of the thermogravimetric analysis for the P&B MDR relay components is included in Section 8 of WCAP-13878-P-A Revision 2.

P&B MDR ESF relays used as normally deenergized ESFAS slave relays will not experience temperature induced, age related degradation sufficient to result in failure within the 40-year plant life. Degradation of critical components requires substantial time and would result in no perceptible change in relay performance. Degradation of non-critical components will have no adverse impact on relay performance or reliability. MDR relays used as normally energized ESFAS slave relays will experience temperature induced, age related degradation sufficient to result in failure within the 40-year plant life and, therefore, should be replaced periodically dependent on temperature data specific to the location in the plant. With replacement at a conservative interval, normally energized P&B MDR relays will exhibit the same reliability as normally deenergized relays. Catawba does not utilize this relay type in normally energized applications. Therefore, based upon the results of the aging assessment, the probability of a relay malfunctioning or the reliability of slave relays decreasing as a result of an 18-month frequency is low.

Since interposing relays can affect the ultimate function of the slave relay to start the required equipment, interposing relay reliability must be comparable to that of the associated slave relay. All of the slave relays and their actuated devices were evaluated for the presence of interposing relays. The majority of slave relays directly actuate ESF equipment, although some slave relays actuate a combination of equipment both directly and via interposing relays. Testing on an 18-month frequency is adequate to confirm reliability and continuing operability of the P&B MDR relays, subject to service life limitations of normally energized relays, based on the results of WCAP-13878-P-A Revision 2. Interposing relays which are not P&B MDR relays will continue to be tested every 92 days, where applicable.

Conclusions for P&B MDR Relays

The slave relay reliability study verified that P&B MDR slave relays are highly reliable. The aging assessment concludes that the degradation of normally deenergized and normally energized relays is sufficiently slow that an 18-month frequency surveillance interval will adequately identify relay failures. The aging assessment also demonstrates that normally deenergized relays can be

expected to operate reliably over their service life. Catawba does not utilize this relay type in normally energized applications.

Testing on an 18-month frequency is also adequate to confirm reliability and continuing operability of interposing relays which are P&B MDR relays. Relays which are not P&B MDR relays will continue to be tested every 92 days, where applicable.

Based on the above evaluation, Duke Energy Corporation concludes that there is reasonable assurance that the health and safety of the public will not be affected by the proposed changes.

ATTACHMENT 4

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

No Significant Hazards Consideration Determination

As required by 10 CFR 50.91(a)(1), this analysis is provided to demonstrate that the proposed license amendments to change the surveillance interval on selected slave relays from 92 days to 18 months involve no significant hazards consideration. The proposed amendments modify the Surveillance Requirements and Bases for slave relay testing to indicate that the surveillance test frequency will be determined based on the results of WCAP-13877 Revision 2-P-A and WCAP-13878-P-A Revision 2 for Westinghouse Type AR and P&B MDR relays, respectively.

Conformance of the proposed amendments to the standards for a determination of no significant hazards as defined in 10 CFR 50.92 is shown in the following:

1) The proposed license amendments do not involve a significant increase in the probability or consequences of an accident previously evaluated.

   This change to the TS does not result in a condition where the design, material, and construction standards that were applicable prior to the change are altered. Only the slave relay test interval is changed. The proposed change will not modify any system interface and could not increase the likelihood of an accident since these events are independent of this change. The proposed activity will not change, degrade, or prevent actions or alter any assumptions previously made in evaluating the radiological consequences of an accident described in the UFSAR. Therefore, the proposed amendments do not result in any increase in the probability or consequences of an accident previously evaluated.

2) The proposed license amendments do not create the possibility of a new or different kind of accident from any accident previously evaluated.

   This change does not alter the performance of the affected systems. The slave relays will still be tested every 18 months. Changing the surveillance frequency for the slave relays will not create any new accident initiators or scenarios. Periodic surveillance of these instruments will detect significant degradation in the channel characteristic. Implementation of the proposed amendments does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) The proposed license amendments do not involve a significant reduction in a margin of safety.

The surveillance test frequency is relaxed for certain slave relays because of demonstrated high reliability of the relay and its insensitivity to any short term wear or aging effects. Based on the above, it is concluded that the proposed license amendment request does not result in a reduction in a margin with respect to plant safety.

Based on the preceding discussion, it is concluded that relaxation of the slave relay test frequency is acceptable and the proposed license amendments do not involve a significant hazards consideration finding as defined in 10 CFR 50.92.

ATTACHMENT 5

ENVIRONMENTAL ANALYSIS

Environmental Analysis

Pursuant to 10 CFR 51.22(b), an evaluation of this license amendment request has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) of the regulations.

This amendment revises TS Sections 3.3.2, Engineered Safety Feature Actuation System Instrumentation, and 3.3.6, Containment Air Release and Addition Isolation Instrumentation, to change the surveillance frequency on selected ESFAS slave relays from 92 days to 18 months.

Implementation of this amendment will have no adverse impact upon the Catawba units; neither will it contribute to any additional quantity or type of effluent being available for adverse environmental impact or personnel exposure.

It has been determined there is:

1. No significant hazards consideration,

2. No significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite, and

3. No significant increase in individual or cumulative occupational radiation exposures involved.

Therefore, this amendment to the Catawba TS and associated Bases meets the criteria of 10 CFR 51.22(c)(9) for categorical exclusion from an environmental impact statement.