

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Richard A. Muench
Vice President Engineering

March 21, 1997

ET 97-0027

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Reference: Letter ET 96-0097 dated December 3, 1996 from
R.A. Muench, WCNOC, to NRC

Subject: Docket No. 50-482: Revised Amendment Request for
Technical Specification 6.8.5b, Reactor Coolant Pump
Flywheel Inspection Program

Gentlemen:

The following is a revised application for amendment to Facility Operating License No. NPF-42 for Wolf Creek Generating Station. This revised application replaces the Reference in its entirety. This revised application is based on a telecon between WCNOC and the NRC on March 7, 1997. This request proposes to revise Technical Specification 6.8.5b, Reactor Coolant Pump Flywheel Inspection Program to provide an exception to the examination requirements in Regulatory Guide 1.14, Revision 1, "Reactor Coolant Pump Flywheel Integrity." The proposed exception to the recommendations of Regulatory Position C.4.b would allow for an acceptable inspection method of either an ultrasonic volumetric or surface examination. The acceptable inspection method would be conducted at approximately 10 year intervals. Wolf Creek Nuclear Operating Corporation's (WCNOC) request is based on the results of previous examinations and the specific wording from the NRC Safety Evaluation Report on WCAP-14535, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination."

Additionally, this license amendment request corrects a typographical error in Technical Specification 6.8.5c, Containment Tendon Surveillance Program. This specification incorrectly references draft Revision 3 of Regulatory Guide 1.35, dated April, 1989. Draft Revision 3 of Regulatory Guide 1.35 was issued in April, 1979.

A Safety Evaluation is provided in Attachment I, and Attachment II provides a No Significant Hazards Consideration Determination. Attachment III is the Environmental Impact Determination, and the marked-up technical specification page for this request is provided in Attachment IV.

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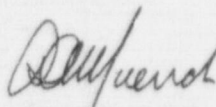
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In accordance with 10 CFR 50.91, a copy of this revision to our original application, with attachments, is being provided to the designated Kansas State Official. This proposed revision to the WCGS Technical Specifications will be fully implemented within 30 days of formal NRC approval.

If you have any questions concerning this matter, please contact me at (316) 364-8831, extension 4034, or Mr. Richard D. Flannigan, at extension 4500.

Very truly yours.



Richard A. Muehl

RAM/jad

Attachments I - Safety Evaluation
 II - No Significant Hazards Consideration Determination
 III - Environmental Impact Determination
 IV - Proposed Technical Specification Change

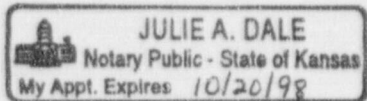
cc: V. L. Cooper (KDHE), w/a
 W. D. Johnson (NRC), w/a
 E. W. Merschoff, w/a
 J. F. Ringwald (NRC), w/a
 J. C. Stone (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Richard A. Muench, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By *Richard A. Muench*
Richard A. Muench
Vice President
Engineering

SUBSCRIBED and sworn to before me this 21st day of March, 1997.



Julie A. Dale
Notary Public

Expiration Date 10/20/98

ATTACHMENT I
SAFETY EVALUATION

Safety Evaluation

Proposed Change

This license amendment request proposes to revise the Wolf Creek Generating Station (WCGS) Technical Specification 6.8.5b, Reactor Coolant Pump Flywheel Inspection Program to provide an exception to the examination requirements in Regulatory Guide 1.14, Revision 1, "Reactor Coolant Pump Flywheel Integrity." The proposed exception to the recommendations of Regulatory Position C.4.b would allow for an acceptable inspection method of either an ultrasonic volumetric or surface examination. The acceptable inspection method would be conducted at approximately 10-year intervals.

This license amendment request additionally corrects a typographical error in Technical Specification 6.8.5c, Containment Tendon Surveillance Program. This specification incorrectly references draft Revision 3 of Regulatory Guide 1.35, dated April, 1989. Draft Revision 3 of Regulatory Guide 1.35 was issued in April, 1979. WCNOC submitted a license amendment request on May 24, 1994 (NA 94-0089) and a supplemental letter on April 6, 1995 (CO 95-0032) which proposed to incorporate improvements in scope and content endorsed by the NRC in its Final Policy Statement on Technical Specifications for Improvements for Nuclear Power Reactors. As a result of this request, specification 6.8.5c was proposed with an incorrect issuance date of the draft Regulatory Guide. The Updated Safety Analysis Report, Appendix 3A, correctly references draft Revision 3 of Regulatory Guide 1.35, dated April 1979.

Background

Regulatory Guide 1.14, Revision 1, Regulatory Position C.4.b states "Inservice inspection should be performed for each flywheel as follows: (2) A surface examination of all exposed surfaces and complete ultrasonic volumetric examination at approximately 10-year intervals, during the plant shutdown coinciding with the inservice inspection schedule as required by Section XI of the ASME Code." In February 1995, a change to the Updated Safety Analysis Report (USAR) was implemented to add an exception to the commitments to Regulatory Guide 1.14, Revision 1, to address the frequency of the flywheel inspection. Because of a change to the 10-year reactor coolant pump (RCP) motor refurbishment schedule, examination of the flywheel in the RCP "D" motor was not performed prior to the completion of the 10-year inservice inspection interval, including the extension allowed by ASME Section XI. Subsequently, during an NRC inspection conducted during the period October 7, 1996 through October 25, 1996, the NRC indicated that the proposed exception should have been reviewed and approved by the NRC as a change to the Technical Specifications.

Evaluation

An integral part of the reactor coolant system (RCS) in pressurized water reactor plants is the RCP, a vertical, single stage, single-suction, centrifugal, shaft seal pump. The RCP ensures an adequate cooling flow rate by circulating large volumes of the primary coolant water at high temperature and pressure through the RCS. Following an assumed loss of power to the RCP motor, the flywheel, in conjunction with the impeller and motor assembly,

provide sufficient rotational inertia to assure adequate cooling flow during RCP coastdown. This forced flow and the subsequent natural circulation effect of the RCS results in adequate core cooling.

During normal power operation, the RCP flywheel possesses sufficient kinetic energy to produce high energy missiles in the event of failure. Conditions which may result in overspeed of the RCP increases both the potential for failure and the kinetic energy of the flywheel. This led to issuance of Regulatory Guide 1.14 which provided recommendations of actions to ensure flywheel integrity.

Integrity of the RCP flywheel is assured on the basis of the use of suitable material, adequate design and inspection. The calculated stresses at operating speed are based on stresses due to centrifugal forces. The stress resulting from the interference fit of the flywheel on the shaft is less than 2,000 psi at zero speed, but this stress becomes zero at approximately 600 rpm because of radial expansion of the hub. The RCPs run at approximately 1,190 rpm and may operate briefly at overspeeds of 109 percent during loss of load. For conservatism, however, 125 percent of operating speed was selected as the design speed for the pumps. The flywheels were given a preoperational test of 125 percent of the maximum synchronous speed of the motor. The flywheel consists of two thick plates bolted together. The flywheel material is produced by a process that minimizes flaws in the material and improves its fracture toughness properties, such as vacuum degassing, vacuum melting, or electroslag remelting. Each plate is fabricated from SA-533, Grade B, Class 1 steel.

Previous Examination Results

RCP flywheel examinations are performed in accordance with the WCGS Inservice Inspection Program during refueling outages or motor refurbishment. The results of full volumetric examinations and complete surface examinations, including bore and keyway areas performed by WCNOC during the first inservice inspection interval (see Table 1) met the recommendations of the Regulatory Guide. Additionally, the in-place volumetric examinations of the RCP flywheels at approximately 3-year intervals were performed with no recordable indications detected.

WCNOC shares a spare RCP motor with Union Electric's Callaway Plant. This allows RCP motor refurbishment to be performed with each motor transported offsite. WCNOC performs the required 10-year inservice inspections during this refurbishment because accessibility for flywheel inspection is better and the work environment is improved, e.g., not restricted to examination within the bioshield or other locations within the Containment structure.

RCP motor "D" is not represented in Table 1 because the 10-year inservice inspection was not performed as a result of changes to the RCP refurbishment schedule. Although the 10-year examination had not been performed as required by Regulatory Guide 1.14, the 3-year examination was successfully completed as scheduled with no indications identified. The three year examination was a volumetric examination of the higher stress areas and was performed from the gage holes to the bore and keyways. This 3-year examination is similar to the 10-year alternative examination found acceptable through issuance of a NRC

Safety Evaluation Report (SER) (letter dated September 12, 1996) on WCAP-14535, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination."

The focus of the WCAP was to eliminate examinations of the flywheels altogether; however, it was accepted by the NRC that the requirements could be reduced based on the evidence provided by the WCAP. Licensees may now perform an ultrasonic examination over the volume from the inner bore of the flywheel to the circle of one-half the outer radius or a complete surface examination on an approximate 10-year frequency in lieu of the current examination schedule established by Regulatory Guide 1.14, Revision 1. Based on the evaluation provided by the NRC SER, the 3-year examination on RCP motor "D" performed in September 1994 provides an acceptable examination to satisfy the 10-year inservice inspection requirements.

Table 1
Full 10-Year Surface and Volumetric Examinations

Year	RCP ID	Examination	Results
1991	B	Complete MT (PT of bore/keyway) and UT of high stress regions and 0° UT of full volume.	No indications
1994	C	Complete MT (PT of bore/keyway) and UT of high stress regions and 0° UT of full volume.	No indications
1995	A	Complete MT (PT of bore/keyway) and UT of high stress regions and 0° UT of full volume.	Circular spacer wear marks on bottom surface within area of seal ring.

WCAP-14535 "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination"

WCAP-14535 documents the results of flywheel inspections from approximately 57 nuclear stations covering approximately 217 flywheels and 729 examinations. The results show that there were no indications found that would affect the integrity of the flywheels. A number of recordable indications found were in the form of nicks and gashes in the keyway area created as a result of the disassembly and subsequent reassembly required to perform the flywheel inspections.

The results of flywheel inspections presented in WCAP-14535 show that flywheel integrity and plant safety are increased by eliminating flywheel inspections. Detailed stress and fracture analyses as well as risk analysis have been completed with the results indicating that there would be no change in the probability of failure for RCP flywheels if all inspections were eliminated.

The NRC documented in their SER (letter dated September 12, 1996) to Duquesne Light Company that it was acceptable to reference WCAP-14535 in license applications to the extent specified and under the limitation delineated in the report and the associated NRC SER. The SER concluded that inspections should not be completely eliminated and should be conducted during scheduled inservice inspections or RCP motor maintenance at approximately 10-year

intervals. WCNOG has confirmed that the flywheels are made of SA-533 B material (as discussed above) and that the items specified for accepting this amendment request in the conclusions section of the SER are met.

Based on the above discussions and the no significant hazards consideration determination presented in Attachment II, the proposed changes do not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report; or create a possibility for an accident or malfunction of a different type than any previously evaluated in the safety analysis report; or reduce the margin of safety as defined in the basis for any technical specification. Therefore, the proposed changes do not adversely affect or endanger the health or safety of the general public or involve a significant safety hazard.

ATTACHMENT II

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

No Significant Hazards Consideration Determination

This license amendment request proposes to revise the Wolf Creek Generating Station (WCGS) Technical Specification 6.8.5b, Reactor Coolant Pump Flywheel Inspection Program to provide an exception to the examination requirements in Regulatory Guide 1.14, Revision 1, "Reactor Coolant Pump Flywheel Integrity." The proposed exception to the recommendations of Regulatory Position C.4.b would allow for an acceptable inspection method of either an ultrasonic volumetric or surface examination. The acceptable inspection method would be conducted at approximately 10 year intervals.

Additionally, this license amendment request additionally corrects a typographical error in Technical Specification 6.8.5c, Containment Tendon Surveillance Program. This specification incorrectly references draft Revision 3 of Regulatory Guide 1.35, dated April, 1989. Draft Revision 3 of Regulatory Guide 1.35 was issued in April, 1979. WCNOG submitted a license amendment request on May 24, 1994 (NA 94-0089) and a supplemental letter on April 6, 1995 (CO 95-0032) which proposed to incorporate improvements in scope and content endorsed by the NRC in its Final Policy Statement on Technical Specifications for Improvements for Nuclear Power Reactors. As a result of this request, specification 6.8.5c was proposed with an incorrect issuance date of the draft Regulatory Guide. The Updated Safety Analysis Report, Appendix 3A, correctly references draft Revision 3 of Regulatory Guide 1.35, dated April 1979.

The NRC has provided standards for determining whether a significant hazards consideration exists (10 CFR 50.92(c)). A proposed amendment to an operating license for a facility involves no significant hazards consideration, if operation of the facility in accordance with the proposed amendments would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed below:

Standard I - Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated

The safety function of the RCP flywheels is to provide a coastdown period during which the RCPs would continue to provide reactor coolant flow to the reactor after loss of power to the RCPs. The maximum loading on the RCP flywheel results from overspeed following a LOCA. The maximum obtainable speed in the event of a LOCA was predicted to be less than 1500 rpm. Therefore, a peak LOCA speed of 1500 rpm is used in the evaluation of RCP flywheel integrity in WCAP-14535. This integrity evaluation shows a very high flaw tolerance for the flywheels. The proposed change does not affect that evaluation. Reduced coastdown times due to a single failed flywheel is bounded by the locked rotor analysis, therefore, it would not place the plant in an unanalyzed condition. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

**Standard II - Create the Possibility of a New or Different Kind of Accident
from any Previously Evaluated**

The proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated since the proposed amendments will not change the physical plant or the modes of plant operation defined in the facility operating license. No new failure mode is introduced due to the proposed change, since the proposed change does not involve the addition or modification of equipment, nor do they alter the design or operation of affected plant systems, structures, or components.

Standard III - Involve a Significant Reduction in the Margin of Safety

The operating limits and functional capabilities of the affected systems, structures, and components are basically unchanged by the proposed amendment. The results of the flywheel inspections performed have identified no indications affecting flywheel integrity. As identified in WCAP-14535, detailed stress analysis as well as risk analysis have been completed with the results indicating that there would be no change in the probability of failure for RCP flywheels if all inspections were eliminated. Therefore these changes do not involve a significant reduction in the margin of safety.

Based on the above discussions, it has been determined that the requested technical specification revision does not involve a significant increase in the probability or consequences of an accident or other adverse condition over previous evaluations; or create the possibility of a new or different kind of accident or condition over previous evaluations; or involve a significant reduction in a margin of safety. The requested license amendment does not involve a significant hazards consideration.

ATTACHMENT III
ENVIRONMENTAL IMPACT DETERMINATION

Environmental Impact Determination

10 CFR 51.22(b) specifies the criteria for categorical exclusions from the requirement for a specific environmental assessment per 10 CFR 51.21. This amendment request meets the criteria specified in 10 CFR 51.22(c)(9) as specified below:

- (i) the amendment involves no significant hazards consideration

As demonstrated in Attachment II, the proposed changes do not involve any significant hazards consideration.

- (ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite

The proposed changes do not involve a change to the facility or operating procedures that would cause an increase in the amounts of effluents or create new types of effluents.

- (iii) there is no significant increase in individual or cumulative occupational radiation exposure

The proposed changes do not create additional exposure to personnel nor affect levels of radiation present. Also, the proposed change does not result in any increase in individual or cumulative occupational radiation exposure.

Based on the above it is concluded that there will be no impact on the environment resulting from this change and the change meets the criteria specified in 10 CFR 51.22 for a categorical exclusion from the requirements of 10 CFR 51.21 relative to requiring a specific environmental assessment by the Commission.