

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Forrest T. Rhodes  
Vice President  
Engineering & Technical Services

May 14, 1991

ET 91-0076

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

Subject: Docket No. 50-482: Proposed Revision to Technical  
Specification 5.3.2 to Allow Use of Silver-Indium-Cadmium  
Control Rods

Gentlemen:

The purpose of this letter is to transmit an application for amendment to Facility Operating License No. NPF-42 for Wolf Creek Generating Station (WCGS), Unit No. 1. This proposed license amendment revises Technical Specification 5.3.2, "Control Rod Assemblies", to allow the use of silver-indium-cadmium as the neutron absorbing material in control rods. Technical Specification 5.3.2 currently specifies hafnium as the neutron absorbing material. The proposed revision would allow the use of hafnium control rods, silver-indium-cadmium control rods, or a mixture of both types.

Attachments I through III provide the Safety Evaluation, Significant Hazards Consideration Determination, and Environmental Impact Determination supporting the requested change. Attachment IV provides the revised Technical Specification page.

In accordance with 10 CFR 50.91, a copy of this application, with attachments is being provided to the designated Kansas State Official.

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*11/1*

If you have any questions concerning this matter, please contact me or Mr. H. K. Chernoff of my staff.

Very truly yours,



Forrest T. Rhodes  
Vice President  
Engineering & Technical Services

FTR/jra

Attachments:    I - Safety Evaluation  
                  II - Significant Hazards Consideration Determination  
                  III - Environmental Impact Determination  
                  IV - Proposed Technical Specification Changes

cc: G. W. Allen (KDHE), w/a  
L. L. Gundrum (NRC), w/a  
A. T. Howell (NRC), w/a  
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STATE OF KANSAS       )  
                              ) SS  
COUNTY OF COFFEY     )

Forrest T. Rhodes, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering and Technical Services 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 Forrest T. Rhodes  
Forrest T. Rhodes  
Vice President  
Engineering & Technical Services

SUBSCRIBED and sworn to before me this 14 day of May, 1991.

Marlene Heachmar  
Notary Public

Expiration Date Aug 4, 1994



ATTACHMENT I  
SAFETY EVALUATION

## SAFETY EVALUATION

### DESCRIPTION OF CHANGE

This license amendment request proposes to revise Technical Specification 5.3.2, "Control Rod Assemblies", to allow the use of hafnium or silver-indium-cadmium (Ag-In-Cd) as the neutron absorbing material in the rod cluster control assemblies (RCCAs). Technical Specification 5.3.2 currently discusses only the use of hafnium control rods. The proposed revision would permit the use of hafnium RCCAs, Ag-In-Cd RCCAs, or a mixture of both types.

### EVALUATION

Hafnium is currently used in the RCCAs at Wolf Creek Generating Station (WCGS). Prior to the use of hafnium, Ag-In-Cd was the most commonly used material in RCCAs in Westinghouse reactors. WCGS was originally designed to use Ag-In-Cd RCCAs, but changed to hafnium prior to the initial fuel loading. Ag-In-Cd has continued to be used at numerous plants, however, and a large amount of operating experience has been gained with RCCAs utilizing this material. This experience has demonstrated very good results using Ag-In-Cd RCCAs.

RCCAs utilizing Ag-In-Cd are completely interchangeable with hafnium RCCAs. The mechanical designs of the two types of RCCAs are equivalent and identical materials are utilized for spider assemblies and rodlet cladding. RCCA drop times and RCCA worths are also expected to be equivalent and, in any event, are confirmed by testing following each reload. The Ag-In-Cd RCCAs will be subject to the same mechanical, nuclear, and thermal hydraulic limits as the original hafnium RCCAs. Since the two RCCA types are functionally equivalent, a mixture of RCCA types is also acceptable and is allowed by this proposed amendment.

### CONCLUSIONS

The use of Ag-In-Cd RCCAs is consistent with the assumptions and conclusions of the transient and accident analyses for WCGS. Therefore, this proposed change will not increase the probability or consequences of any accident previously analyzed in the Updated Safety Analysis Report nor create the possibility of an accident of a different type than those previously analyzed.

The Ag-In-Cd RCCAs are functionally equivalent to the hafnium RCCAs currently utilized and have performed very well in extensive use at similar facilities. Therefore, there will be no increase in the probability or consequences of a malfunction of equipment important to safety.

The Ag-In-Cd RCCAs will be subject to the same mechanical, nuclear, and thermal hydraulic limits as the original hafnium RCCAs and therefore, there will be no decrease in any margin of safety defined in the technical specifications.

ATTACHMENT II

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

### SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

This proposed change has been reviewed per the standards provided in 10 CFR 50.92. Each standard is discussed separately below.

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

Silver-indium-cadmium (Ag-In-Cd) rod cluster control assemblies (RCCAs) are functionally equivalent to the hafnium RCCAs currently in use at Wolf Creek Generating Station (WCGS). WCGS was originally designed for the use of this type of RCCA and such use is consistent with the assumptions and conclusions of the transient and accident analyses for WCGS. On this basis it is concluded that the consequences and probabilities of previously evaluated accidents are not increased.

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

Ag-In-Cd RCCAs are completely interchangeable with the hafnium RCCAs currently in use at WCGS. The mechanical designs of the two types of RCCAs are equivalent and identical materials are utilized for spider assemblies and rodlet cladding. Ag-In-Cd RCCAs have demonstrated good performance in extensive use at similar facilities. Therefore, this proposed technical specification revision does not create the possibility of a new or different kind of accident from any previously evaluated.

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

The Ag-In-Cd RCCAs will be subject to the same mechanical, nuclear, and thermal hydraulic limits as the original hafnium RCCAs and therefore, there will be no decrease in any margin of safety defined in the technical specifications.

Based on the above, the requested technical specification change does not involve a significant increase in the probability or consequences of a previously evaluated accident, create the possibility of a new or different kind of accident, or involve a significant reduction in the margin of safety. Therefore, the requested license amendment does not involve a significant hazards consideration in accordance with 10 CFR 50.92.



ATTACHMENT III  
ENVIRONMENTAL IMPACT DETERMINATION



### ENVIRONMENTAL IMPACT DETERMINATION

This amendment request meets the criteria specified in 10 CFR 51.22(c)(9). Specific criteria contained in this section are discussed below.

(i) the amendment involves no significant hazards consideration,

As demonstrated in Attachment II, this proposed amendment does not involve any significant hazards considerations.

(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 change involves the material utilized for neutron absorption in the control rods within the reactor core. Specifically, the proposed amendment would allow the use of Rod Cluster Control Assemblies (RCCAs) using silver-indium-cadmium (Ag-In-Cd) as the neutron absorbing material in addition to the hafnium RCCAs which are currently in use. The neutron absorber material is fully enclosed within stainless steel cladding and has no effect on the chemistry of the water utilized for reactor coolant. Therefore, this change will have no effect on normal plant effluents and there will be no change in the types or amounts of any effluents released offsite.

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

The RCCAs utilizing Ag-In-Cd are functionally equivalent to the current hafnium RCCAs. Operation with Ag-In-Cd RCCAs or a mixture of Ag-In-Cd and hafnium RCCAs will not affect the general levels of radiation present in the facility. The installation, removal and handling of RCCAs are accomplished as part of normal refueling activities and will be unaffected by this proposed change. Therefore, there will be no significant increase in individual or cumulative occupational radiation exposure associated with this proposed change.

Based on the above, 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 specific environment assessment by the Commission.