Docket Number 50-346
License Number NPF-3
Serial Number 1924
Enclosure
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Application for Amendment
to
Facility Operating License Number NPF-3
Davis-Besse Nuclear Power Station
Unit Number 1

Attached are requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1, Facility Operating License Number NPF-3. Also included is the Safety Assessment and Significant Hazards Consideration.

The proposed changes submitted under cover letter Serial Number 1924 concern:

Appendix A, Technical Specification 5.3.1, Fuel Assemblies

By: _____
D. C. Shelton, Vice President,
Nuclear - Davis-Besse

Sworn and Subscribed before me this 31st day of May, 1991.

_____
Notary Public, State of Ohio

EVELYN L. DRESS
NOTARY PUBLIC, STATE OF OHIO
My Commission Expires July 28, 1994

The following information is provided to support issuance of the requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1, Operating License Number NPF-3, Appendix A, Technical Specification 5.3.1, Fuel Assemblies.

A. Time Required to Implement: This change is to be implemented within 45 days after the NRC issuance of the License Amendment.

B. Reason for change (License Amendment Request 91-0011): This change will allow the removal of defective fuel rods or the replacement of defective fuel rods with stainless steel or Zircaloy filler rods. The acceptability of non-fuel bearing rods or water channels will be determined by cycle specific reload analyses, using NRC approved methodologies. NRC approval will be required for initial post-refueling start-up for any reactor core that contains a fuel assembly of less than 208 active fuel rods.

C. Safety Assessment and Significant Hazards Consideration: See attached.

SAFETY ASSESSMENT AND SIGNIFICANT HAZARDS CONSIDERATION
FOR LICENSE AMENDMENT REQUEST NO. 91-0011

TITLE:

Revision to Technical Specification (TS) 5.3.1, Fuel Assemblies, to Allow Repair by Removal of Defective Rods or Replacement of Defective Fuel Rods with Stainless Steel or Zircaloy Filler Rods

DESCRIPTION:

This License Amendment Request (LAR) proposes revision of TS 5.3.1 to allow removal of defective fuel rods or replacement of defective fuel rods with stainless steel or Zircaloy filler rods in the Babcock and Wilcox designed Mark B fuel assembly. The acceptability of water channels or non-fuel bearing rods will be determined by cycle specific reload analyses, using Nuclear Regulatory Commission (NRC) approved methodologies. NRC approval will be required for initial post-refueling start-up for any core that deviates from the normal design (177 fuel assemblies with each fuel assembly containing 208 fuel rods clad with Zircaloy-4) as described in TS 5.3.1.

There is a potential that such changes to the fuel assemblies will be performed at the Davis-Besse Nuclear Power Station, Unit 1 (DBNPS) during the seventh refueling outage (7RFO). Due to the specific descriptive wording of the present TS 5.3.1 and the need to be in the refueling mode (Mode 6) to determine the specific changes that must be made to an assembly, an expedient TS revision would be necessary to allow plant restart without causing a delay. A request is being made at this time to incorporate new TS wording prior to the 7RFO that will provide for NRC review and approval of the specific fuel assembly changes while avoiding the need for expenditure of both Toledo Edison's (TEs) and the NRC's resources in administering an expedient TS revision. It therefore provides for a more efficient use of TE and NRC resources during the 7RFO.

SYSTEMS, COMPONENTS, AND ACTIVITIES AFFECTED:

This TS revision affects the description of the fuel assemblies in TS 5.3.1 by allowing for a reduced number of fuel rods and use of water channels, or stainless steel or Zircaloy filler rods.

SAFETY FUNCTIONS OF THE AFFECTED SYSTEMS, COMPONENTS AND ACTIVITIES:

The function of the reactor core, i.e. fuel assemblies, is to generate power for a specified period. Their design assures the safe operation of the reactor core within operating and safety limits.

A fuel assembly is composed of two hundred and eight fuel rods, sixteen control rod guide tubes, one instrumentation tube assembly, eight spacer grids, and two end fittings. The guide tubes, spacer grids, and end fittings form a structural cage to arrange the rods and tubes into a 15x15

array. Fuel rods are supported at each spacer grid by contact points. The guide tubes are attached to the upper and lower end fittings. The use of similar material in the guide tubes and fuel rods results in minimal differential thermal expansion.

The function of TS 5.3.1 is to ensure that the fuel configuration has been analyzed using NRC approved methodologies and that safety limits and design criteria are maintained.

EFFECTS ON SAFETY:

Fuel assembly repair by extraction of defective fuel rods or replacement of defective fuel rods with stainless steel filler rods has been previously implemented at other facilities, for example, most recently at Three Mile Island Nuclear Generating Station, Unit Number 1, and Arkansas Nuclear One, Unit No. 1. Replacement with Zircaloy rods has also been previously implemented at other facilities. Repairs may also involve recaging the non-defective fuel rods into a new fuel assembly structure. These repairs are considered acceptable provided that the number of water channels or substitutions are limited to fuel designs that have been analyzed with applicable NRC approved codes and methods.

During the cycle specific evaluation, the effects of water channels or stainless steel or Zircaloy rods and the change from Inconel to Zircaloy grids (the latter analysis is to be done in the case of recaging) will be analyzed, and NRC approval obtained for initial post-refueling start-up. The analyses will address the effect of the repair on performance parameters such as reactivity, power peaking, margin to departure from nucleate boiling for the surrounding fuel rods, and mechanical design to show that existing safety limits and design criteria will still be met.

The fuel design report identifies that the number of fuel rods does not affect a fuel assembly's structural ability to withstand normal handling. The fuel assembly's strength is determined by the upper and lower end fittings and the guide tubes that separate them.

The fuel rods and stainless steel or Zircaloy filler rods are contained by the eight spacer grids. The stainless steel or Zircaloy filler rods have been designed to not affect spacer grid spring loadings that could be translated to adjacent fuel rods, yet they will be firmly contained for the remaining design life of the fuel assembly.

The stainless steel or Zircaloy filler rod design also will not affect the fuel assembly's lift characteristics with the start of a reactor coolant pump.

The materials used for the stainless steel or Zircaloy filler rods are standard fuel assembly materials and are suitable for the reactor environment.

Revising TS 5.3.1 to allow the use of water channels, or stainless steel or Zircaloy filler rods, while requiring: 1) use of NRC approved methodologies in determining the acceptability of non-fuel bearing rods or water channels in cycle specific reload analyses, and 2) NRC approval of initial post-refueling start-up relieves TE and the NRC of the unnecessary burden of administering an expedient TS revision. Therefore, it provides for a more efficient use of TE and NRC resources.

In summary, there is no adverse effect on safety since this TS revision is only for the description of the number of fuel rods in a Mark B fuel design, and would require confirmatory analyses to be performed using NRC approved codes and methods, prior to a new cycle start-up. Furthermore, NRC approval of the initial post-refueling start-up would be required, thereby, maintaining NRC approval of fuel assembly changes.

SIGNIFICANT HAZARDS CONSIDERATION:

The NRC has provided standards in 10 CFR 50.92(c) for determining whether a significant hazard exists due to a proposed amendment to an Operating License for a facility. A proposed amendment involves no significant hazards consideration if operation of the facility in accordance with the proposed changes would: (1) Not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) Not create the possibility of a new or different kind of accident from any previously evaluated; or (3) Not involve a significant reduction in a margin of safety. Toledo Edison has reviewed the proposed changes and determined that a significant hazards consideration does not exist because operation of the DBNPS in accordance with the proposed changes would:

1a. Not involve a significant increase in the probability of an accident previously evaluated because the probability of any accident which is presently evaluated is independent of the fuel design or assembly configuration. Therefore, no accident initiators or assumptions are affected.

1b. Not involve a significant increase in the consequences of an accident previously evaluated because the core performance and accident response will be bounded by the cycle specific reload analysis, which assures that there is no effect on the radiological consequences of previously evaluated accidents.

2a. Not create the possibility of a new kind of accident from any accident previously evaluated because the modified fuel assemblies will meet design specifications and still do not affect accident initiation. Thus, although this proposed change would allow modifications to fuel assemblies, the effects of such modifications would not lead to the initiation of a new kind of accident.

2b. Not create the possibility of a different kind of accident from any accident previously evaluated because the modified fuel assemblies will meet design specifications and still do not affect accident

initiation. Thus, although this proposed change would allow modifications to fuel assemblies, the effects of such modifications would not lead to the initiation of a different kind of accident.

3. Not involve a significant reduction in a margin of safety because the removal of defective fuel rods or replacement of defective fuel rods will be bounded by the cycle specific reload analysis using NRC approved methodologies, which verifies that safety margins are maintained. Therefore, conformance to existing design criteria and safety analysis limits will be confirmed before operation during the next fuel cycle.

CONCLUSION:

On the basis of the above, Toledo Edison has determined that the License Amendment Request does not involve a significant hazards consideration. As this License Amendment Request concerns proposed changes to the Technical Specifications that must be reviewed by the Nuclear Regulatory Commission, this License Amendment Request does not constitute an unreviewed safety question.

ATTACHMENT:

Attached are the proposed marked-up changes to the Operating License.