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M-37
71-0570



GENERAL NUCLEAR SYSTEMS, INC.

A CHEM-NUCLEAR COMPANY

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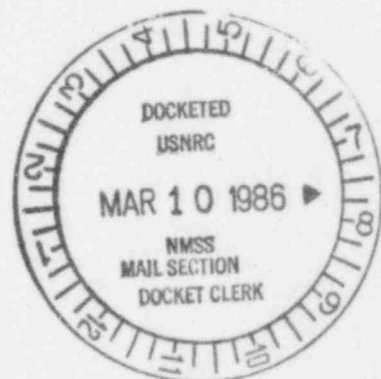
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February 28, 1986

LC-8502-16

Mr. John P. Roberts, Project Manager
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: NRC Project M-37
CASTOR V/21 TSAR Amendment



Dear Mr. Roberts:

This transmittal is a request for an amendment to the subject CASTOR V/21 TSAR to include an all stainless steel basket design. The design and geometry is identical to that presented in the previous TSAR submittal with the exception of the deletion of RADIONOX A-18 (X4 CrNiR 1913). The replacement material is stainless steel No. 1.4541 (X10 CrNiTi 189) noted on page 3.2-17 of the TSAR. As noted in page 3.2-19 all structural calculations for the basket were based on material No. 1.4541.

The maximum U-235 enrichment of the fuel assemblies to be stored in a cask equipped with an all stainless steel basket will be 2.2%. This design maintains criticality safety by analysis and dimensional check of the basket. There is no boron in the basket structure. The methodology for criticality analysis described in Section 3.3.4 of the TSAR was also used to evaluate this case.

The calculations performed for the CASTOR V/21 cask concludes that the cask design maintains criticality safety during all modes of cask operation, i.e. wet loading and dry storage.

The KENO-calculation for 2.2 wt % enrichment of U-235 considered fresh undepleted fuel conditions and total neutron reflection at outside cask walls.

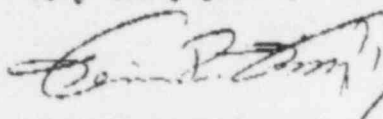
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The K-effective value calculated for this condition is 0.920 ± 0.003 , based on a cask in an upright position in an infinite array of closely spaced casks with optimally moderated fuel assemblies. This value is below the maximum acceptable design limit for K_{eff} of 0.95. The results of the criticality analysis clearly indicate that the CASTOR V/21 cask is designed to maintain criticality safety and to prevent a nuclear criticality accident in compliance with 10 CFR 72.73. The calculations supporting this case will be incorporated into the TSAR.

Very truly yours,

 for RTA

Robert T. Anderson
Director, Cask & Transportation Systems

/ld

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PROJECT NO. M-37 71-0510

PROJECT NO. 26577

DATE OF DOC. 02/28/86

DATE REC'D. 03/10/86

☐ PDR ☒

☒ LYDR ☐

☐ I&E REF. ☒

☐ SAFEGUARDS ☒

☒ OTHER ☐

REMARKS:

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DATE RCVD. 03/10/86

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WMUR SAFEGUARDS ✓

PCTC ✓ OTHER

DESCRIPTION:

request for
Amendment

03/10/86 INITIAL CEC