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NRC/TMI-82-079 December 23, 1982

Docket No. 50-320

Mr. B. K. Kanga Director, TM1-2 GPU Nuclear Corporation P. O. Box 480 Middletown, PA 17057

Dear Hr. Kanga:

Subject: Shipment of Spent SDS Liners Containing Special Gas Passification Systems

Reference: Letter from B. K. Kanga to L. H. Barrett, 4410-82-0072, same subject, dated December 17, 1982

The THI:PO staff has reviewed your proposed plan for shipping spent Submerged Demineralizer System (SOS) liners which require special passification systems. We have also reviewed your proposed shipping criteria and the methodology used to demonstrate compliance with the DOT and NRC requirements including the Certificate of Compliance (COC No. 9152/B) for the CNS-I-13C II (type B) shipping cask.

The special passification systems include the use of a catalytic recombiner, a vacuum drying system for dewatering the liner, and the installation of a special pressure relief device on each SDS liner prior to shipment. The purpose of the catalytic recombiner is to ensure that combustible gas mixtures are not generated and vacuum conditions are maintained during the liner handling and shipment period. The vacuum dryed liner condition provides assurance that sufficient water removal has occurred and optimizes conditions for the catalyst to recombine the hydrogen and oxygen gases produced by the radiolysis of the residual water remaining in the liner. The special relief device provides over pressure protection for the spent SDS liner during extended off-site storage periods at the Rockwell Hanford Operations (RHO) facility. The THI:PO staff has previously approved the installation of the special relief device as described in the L. H. Barrett to B. K. Kanga letter, same subject, dated October 21, 1982.

You have committed to three criteria for shipping the recombiner-loaded spent SOS liners. They are: (1) the residual water content of the liner will not exceed 120 lbs. during handling and shipment, (2) the hydrogen gas concentration will be limited to no more than 5% by volume at standard temperature and pressure (1.e., no more than 0.063 gram-moles/ft<sup>2</sup> at 14.7 psia and 70°F) and (3) if the hydrogen criteria cannot be demonstrated (due to non-stoichiometric production) the oxygen gas concentration shall be limited to no more than 5% by volume.

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## Mr. B. K. Kanga

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approve of your methodology. The measured method, which incorporates pre and post weighing of the vacuum dryed liner, will provide an accurate measurement  $(\pm 5 \text{ lbs})$  of the water removed. The more conservative water weight of 220 lbs (as measured by RHO) for a bulk dewatered (nitrogen purged) liner will also provide additional conservatism in residual water content measurement. Your proposed calculated method, which was to be used as a backup technique, is also adequate and the staff requires both methods for verification on each SDS liner. Based on the residual water criteria of 120 lbs and conservatisms in the RHO recombiner test for both normal operation and potential accidents these weight verification methods provide adequate measurements and safety margins for shipments.

The gas composition criteria is consistent with the requirements of the NRC's COC for use of the CNS-I-13C II shipping cask. Each spent SDS liner will be monitored and sampled to demonstrate compliance with these requirements. The staff has reviewed your procedures and hardware for liner sampling and gas analyses, and we approve your proposed techniques and analytical capability. In addition, each spent SDS shipment will include the nitrogen inerting of the shipping cask void space which will provide additional safety assurance of non-combustible conditions within the waste package. Since each SDS liner will be prepared for shipment in accordance with NRC approved procedures, pursuant to Technical Specification 6.8.2 and also meet the requirement of the Type B (designed to withstand transport accident) shipping cask certificate of compliance, the staff concludes that adequate controls and safety features exist.

As per our previous letter on SDS shipments (NRC/TMI-82-032) each spent liner shipment will be subject to individual analysis and test including verification of curic loadings, residual water content, gas analysis, dose rate survey and related information to demonstrate compliance with all applicable NRC and DOT regulations. NRC will continue to review the above information and inspect each shipping container on an individual basis prior to actual shipment.

We therefore approve your plan, subject to the individual information packages with supporting data, for shipping of recombiner-loaded SDS liners. Additionally, we recognize that DOE will take possession of this waste material at the site boundary and be the designated shipper of record. The THI:PO staff will continue to complete a radiological survey verification and provide this information to DOE.

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