71-9225

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November 9, 2006

U. S. Nuclear Regulatory Commission
11555 Rockville Pike
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Attn: Document Control Desk

Subject: Request for Authorization to Use the Alternate Drain Line without the Drain Alignment Ring for Spent Fuel Shipments in the NAC-LWT Cask

Docket No.: 71-9225

References:
1. Certificate of Compliance (CoC) No. 9225, Revision 42 for the Model NAC-LWT Package, US Nuclear Regulatory Commission, August 3, 2006
2. Safety Analysis Report for the NAC Legal Weight Truck Cask, Revision 37, NAC International, June 2005, as Supplemented April 17, 2006, June 9 and June 15, 2006.
3. License Drawing 315-40-02, Revision 17, Legal Weight Truck Cask Body Assembly Safety Analysis Report, NAC International
4. License Drawing 315-40-110, Revision 1, 7 Cell Basket, Bottom Module, DIDO Fuel, NAC International

NAC license drawing, 315-40-02 (Reference 3) in Section F-F on Sheet 2 of 2 identifies two options for drain tube configuration. The purpose of this communication is to request NRC authorization to use Item No. 12 (1-inch O.D. tubing) and Item No. 28 (3/8-inch Schedule 40 pipe) interchangeably with or without Item No. 13 (drain alignment ring).

The Bill of Material on Sheet 1 of 2 of the above license drawing reflects this intent as it identifies 1 of each Item No. 12 and Item No. 28 for assemblies 98 and 99. It also calls for 1 of Item 13 for both assemblies 98 and 99. It is recognized that the drain line assembly options should be more clearly identified with the following Delta note added to Sheet 1 of 2 of Reference 3: *"Items 12, 13 and 28 to be used as required for a specific basket loading configuration for planned unloading methods and equipment."* This delta note will be added to the drawing and will be included in the next amendment request for the NAC-LWT package planned to be submitted this month.

In order to support current cask loading and preparation activities and near-term spent fuel shipping schedules, including a reserved ISO certified cask transport vessel, authorization is being requested to use the above described clarification prior to its formal approval via amendment and until the above change can be incorporated into Reference 2.

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The drain tube (in conjunction with the notch on the basket) is an operational feature that helps with proper alignment and orientation of the basket modules when loading into and unloading from the NAC-LWT cask. The drain tube(s), mounting hardware and drain alignment ring are all Quality Category C operational components. Presence of the drain tube does not contribute to the safe performance of the package during transport and has no structural significance. Therefore, no structural evaluation has been performed for the use of either drain tube arrangement.

Loading the DIDO style basket modules (i.e., DIDO and ANSTO basket modules) without the drain alignment ring installed will result in the basket resting on the bottom of the NAC-LWT cask with the base plate of the bottom basket in contact with the cask inner shell 1.5-inch radius fillet. This interface between the basket and the cask wall presents a load path when the cask is in a vertical orientation. The load from the basket bottom plate is distributed to the cask body around the plate circumference instead of the base ring (Item 14, Reference 4). This load configuration has been analyzed for normal conditions of transport and for hypothetical accident conditions specifically in support of this request and the results of the analyses are summarized in Attachment 1 to this letter. The analysis performed is bounding for the cases when the non-structural drain alignment ring (Item No. 13, Reference 3) is installed.

In addition, the use of either drain line with or without the drain alignment ring has no impact on the thermal, containment, shielding or criticality performance of the NAC-LWT packaging or the associated analyses contained in Reference 2.

In addition to the above, NAC is hereby requesting the authorization to include a temporary procedural modification to Chapter 7, Section 7.1.4 Procedures for Dry Loading of DIDO, Spiral, MOATA and MTR Fuel Elements in Basket Modules into the NAC-LWT Cask, Step 13 to "*Visually inspect the inner cavity for foreign material or damage. Install or verify presence of a proper drain tube including drain alignment ring,* ***as required.***" This procedure change will also be included in the next NAC-LWT amendment request.

The items requested to be authorized do not affect the design basis evaluations for licensing and the safe operation of the NAC-LWT cask during transport, as described in the CoC and the SAR. All requirements of the CoC and the SAR will continue to be met.

NAC requests that the above authorization be issued by November 15, 2006 and be valid for a period of one year from the date of issuance to support ongoing cask loading operations and the established shipment schedule under the DOE NNSA Foreign Research Reactor (FRR) program and to allow for sufficient time to process the next NAC-LWT amendment request.

If you have any questions, please contact me on my direct line at 678-328-1274.

Sincerely,

Anthony L. Patko
Director, Licensing
Engineering

Attachment 1 – Summary of the Results of Structural Evaluations of DIDO Style Baskets in the NAC-LWT Cask without Drain Alignment Ring

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Attachment 1

Summary of the Results of Structural Evaluations of DIDO Style baskets in the NAC-LWT Cask without Drain Alignment Ring

The DIDO style basket module assembly in the LWT cask without the drain alignment ring introduces a load path between the basket assembly and cask inner shell in the vertical configuration where the weight of the contents is transmitted to the cask body as a distributed load at the circumferential interface of the basket assembly bottom plate with the cask cavity wall transition to the bottom forging. The bounding loading condition for the structural performance of the basket interfacing with the bottom of the cask inner shell is the bottom end drop configuration. The stresses of the tube wall and the bottom plate of the bottom module are evaluated for the normal condition end drop and the accident condition end drop using the ANSYS quarter-symmetry finite element model of the ANSTO basket as shown in Figure 1.

This model is applicable to both the ANSTO and DIDO baskets since the basket designs are similar and the governing parameters (e.g. tube wall thickness and base plate thickness) are identical for both baskets. The quarter symmetry model conservatively includes the drain line notch in the basket base plate reducing plate stiffness in each quadrant. Additionally, the model neglects any stiffness due to the bottom base ring being attached to the basket base plate. The quarter symmetry model includes the 0.30-inch high drain notch in the bottom of each tube. A weight of 1,620 pounds is used for the contents, bounding both the DIDO and ANSTO contents. The support interface of the basket bottom plate with the inner shell is conservatively modeled using contact elements. The loading consists of applying accelerations of 15.8 g's for the normal condition 1-foot end drop and 60 g's for the accident 30-foot end drop. To account for the direct loading of the fuel in the bottom module, pressures were applied to the top surface of the bottom plate corresponding to a 14-pound fuel weight factored by the acceleration corresponding to each loading condition. The allowable stresses are conservatively evaluated using the maximum temperature of 300 °F of the basket for the helium back filled condition during transport (reference SAR Table 3.4-12).

The maximum primary membrane (Pm) stress intensity (S.I.), the primary membrane plus bending (Pm+Pb) S.I. and the corresponding margin of safety (M.S.) are presented in the following table for both normal and accident condition loads. Normal condition bearing stress at the basket bottom plate chamfer interface with the cask body is calculated to be 10.3 ksi. This is well below the allowable bearing stress of 22.4 ksi (Sy at 300°F).

Loading condition/Component	Pm S.I. (ksi)	Pm M.S.	Pm+Pb S.I. (ksi)	Pm+Pb M.S.
Normal condition-tube wall	8.2	+1.44	15.5	+0.93
Normal condition-bottom plate	8.2	+1.44	15.6	+0.92
Accident condition-tube wall	31.1	+0.49	58.9	+0.12
Accident condition-bottom plate	31.3	+0.48	59.0	+0.12

Note: Allowable Stresses: Normal Condition: Pm: Sm, Pm+Pb: 1.5Sm
Accident Condition: Pm: 0.7Su, Pm+Pb: Su

Attachment 1 (Continued)

Therefore, transport of DIDO and ANSTO basket configurations without the use of the drain alignment ring is an acceptable configuration.

Figure 1. Quarter Symmetry Model of the ANSTO LWT Basket for the Bottom End Drop Evaluation