

72-1027



March 16, 2007  
E-24765

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

Subject: Supplemental Information to Application for Amendment 1 to TN-68 CoC 1027  
Docket 72-1027, TAC L23802

Gentlemen:

Transnuclear, Inc. herewith submits supplemental information to its application for Amendment 1 to TN-68 CoC 72-1027. Based on recent discussions with the NRC staff, this revision provides additional information regarding the view factor model for TN-68 casks and boundary conditions for the vacuum drying analysis.

Should you or your staff require additional information, please do not hesitate to contact me at 410-910-6930 or Mr. Don Shaw at 410-910-6878.

Sincerely,

Robert Grubb  
Senior Vice President - Engineering

cc: Mr. Jose Cuadrado (NRC SFST), (one paper copy of this cover letter and Enclosure 1, plus one copy of Enclosure 2)

cc: (without enclosures)

Jeff Gagne, Transnuclear  
David Shortes, Exelon

Enclosures:

1. Discussion of View Factor Model for TN-68 Casks and Boundary Conditions for Vacuum Drying Analysis
2. One electronic copy (one compact disk) of the view factor calculation ANSYS input file

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## Discussion of View Factor Model for TN-68 Casks and Boundary Conditions for Vacuum Drying Analysis

### 1. Revision of View Factor Model for TN-68 Casks

The view factor model changes provided in Reference [1] are revised to consider the effect of the service road between the two pads. The modifications are as follows:

- The service road between the concrete pads is added to the model.
- The service road is considered to be at the same level as the concrete pad top surface.
- The half-symmetric model is reflected over the symmetry plane and the symmetry boundary conditions are removed.

The element mesh sizes on the cask surface are refined to ensure that the revised view factor model is mesh-independent.

The revised model represents 36 casks in a storage configuration shown in Figure 4.10-1 in the SAR [2].

The view factors obtained with this revised model are summarized in Table 1.

**Table 1**  
**View Factors**

View Factor	Value
From emitting cask to receiving casks ( $F_{e,casks}$ )	0.30
From emitting cask to pads/road ( $F_{e,pad-road}$ )	0.28
From emitting cask to ambient ( $F_{e,\infty}$ )	0.42

The calculated view factor of 0.42 is within the range of sensitivity analysis performed on the TN-68 cask thermal model which was described in the previous response to RAI question 4-2 [1].

When using a view factor of 0.42 for the TN-68 cask, the maximum fuel cladding temperature is 638°F and the maximum neutron shield resin temperature is 316°F. The average resin temperature at the hottest cross section is 300°F. The effect of high temperature on the neutron shielding resin discussed in the previous response [1] remains valid.

The ANSYS input file for the view factor calculation is included on the Enclosure 2 compact disk.

TN commits to incorporating the revised view factor model and the corresponding temperatures discussed above when updating the TN-68 UFSAR to incorporate Amendment 1.

## 2. Boundary Conditions for Vacuum Drying Analysis

The temperatures reported in Table 4.5-3 of the SAR [2] were calculated for 100°F ambient temperature in the fuel handling building area. This table was not updated mistakenly for the 115°F ambient temperature in the fuel handling building area. The correct values for vacuum drying steady state run with helium and 30 kW decay heat load are:

Maximum fuel cladding temperature = 606°F

Maximum radial neutron shield resin temperature = 275°F

The differences between the boundary condition for off-normal and vacuum drying cases are the same as those described in Section 4.5.1 of the SAR [2]. The two major factors contributing to the difference between the maximum component temperatures for these two cases are outlined below.

- No insolation is considered over the cask outer surface for vacuum drying conditions.
- The cask, when inside the fuel handling building area during vacuum drying, is allowed to radiate fully to the ambient. For the off-normal case with the cask sitting on the pad, the cask cannot radiate fully to the ambient due to the presence of surrounding casks, causing higher temperatures.

TN also commits to incorporating the correct temperatures discussed above when updating the TN-68 UFSAR to incorporate Amendment 1.

### References

- 1- TN correspondence to NRC, E-24675, "Revision 5 to Application for Amendment 1 to TN-68 CoC 72-1027, Docket 72-1027, TAC L23802," February 22, 2007.
- 2- Safety Analysis Report for TN-68 Cask for Amendment 1, Rev. 5.