

Status of NAC-NS4FR:

- NAC-NS4FR appears to have a clear paper trail that indicates it is Bisco-NS4FR even though some equipment has changed since Bisco-NS4FR was developed.
- It seems that NAC can use Bisco's and the Japanese data on NS4FR to support the long term performance of NAC-NS4FR.
- The only question to ask NAC is about the color change in the material (yellow, green, gray, black versus brown) which may be an indication of change in material properties.

Status of Holtec Holtite-A:

- The Holtec SAR represented Holtite-A as Bisco-NS4FR while it was under review. At that time Holtec had very limited data of its own to support its long term performance. Holtec was relying on Bisco's and the Japanese data because they claimed Holtite-A is Bisco-NS4FR.
- There is not a clear paper trail to document that Holtite-A is Bisco-NS4FR. A former Bisco employee was asked to generate the formulation of Bisco-NS4FR from memory to develop Holtite-A.
- Holtec's first option would be to develop its own long term performance data on Holtite-A as a neutron shield material. This data is currently being gathered. In this case, are there any repercussions from misrepresenting Holtite-A in the SAR [redacted] 7C
- Holtec's second option is to have NRC make the determination that Holtite-A is Bisco NS4FR so the Bisco and Japanese data can be used to support the long term performance of Holtite-A.
- At this time, we do not have enough information to make the determination that Holtite-A is Bisco-NS4FR. We would need to have the following information: Holtec and NAC source material specifications (including vendor name of materials, additive particle size, etc.); Holtec and NAC source material mixing ratios; Holtec and NAC mixing procedures (including order of adding source materials, mixing time, slurry temperature specifications, vacuum pressures, etc.); Holtec and NAC pouring procedures (including use of releasing agents, etc.); and, Holtec and NAC procedures for verification of final material properties.

Recommendations

- Obtain information from NAC regarding the differences in product color.
- If we go forward with making the determination that Holtite-A is the same material as Bisco-NS4FR, I recommend we hire an expert chemist knowledgeable of epoxy resin material chemistry and performance under relatively elevated temperatures and in radiation environments to help us make that determination in the event that this allegation is litigated. If this approach is taken, we will need to obtain more specific information from NAC and Holtec (see above).

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