

From: Lorson, Raymond
Sent: Wednesday, October 14, 2009 6:26 PM
To: Damiano, Debra
Subject: FW: Use of Aluminum Alloys and/or ICode Materials for Structural Applications
Attachments: NRC Meeting Summary Feb 4 93.pdf; NWTRB 89aug21 see p 302 line 22.pdf

Importance: High

From: Seaman, Craig [mailto:cseaman@nacintl.com]
Sent: Wednesday, October 07, 2009 10:16 AM
To: Brach, Bill
Cc: Lorson, Raymond; Benner, Eric; Cole, Kent
Subject: FW: Use of Aluminum Alloys and/or ICode Materials for Structural Applications
Importance: High

Bill,

As a follow up to our conversation last week, we wanted to [point out](#) some information that supports [the proposition](#) that the NRC has maintained an historical regulatory position that aluminum or aluminum alloy was not acceptable for use as a structural material in Part 71 and dual-purpose Part71/Part 72 baskets and that structural material was required to be an ASME or ASTM (or other approved standard) material. We are still searching for additional confirmatory information from our files over the last 20 years, but because some of this information is fairly old, many of our records are already in storage off-site which makes them more time consuming to retrieve.

Relative to the use of an aluminum alloy as a structural material, you can see from the [testimony in attached transcript \(NWTRB 89aug21, page 151, line 22\) from the first meeting \(August 21, 1989\) of the Containers and Transportations Panel of the U.S. Nuclear Waste Technical Review Board, which was created by the U.S. Congress in 1987, that clearly, as far back as 1989, the NRC was concerned with the use of aluminum as a structural material.](#) NAC changed the design of the NAC-STC dual purpose storable transport cask system from an aluminum alloy structural material basket to use stainless steel as the structural disk and upper and lower weldment material in the early 90's for this reason (see the attached NRC Meeting Summary of [February 4, 1993](#)) and reduced the cask's heat load capability accordingly. Additionally, on page 6 of Regulatory Guide 1.193 Code Case N-673, dealing with "Boron Containing Powdered Metallurgy Aluminum Alloy for Storage and Transportation of Spent Nuclear Fuel, Section 111, Division 1" is listed an "Unacceptable Section 111 Code Case." In addition to demonstrating an on-going concern with the use of aluminum alloy, this also implies that such a material would require ASME or some other "recognized standard" certification. However it also indicates that the NRC may not even accept a decision by a Standard or Code organization. We believe that, where there is an applicable Code or Standard, that such certification of a material was the "minimum" that has historically been required by the NRC, although even that might not be sufficient.

Relative to the requirement for an ASME, ASTM or another "recognized standard" certification for a structural material, we offer the requirements in NUREG-1536, the "Standard Review Plan for

Dry Cask Storage Systems.” Specifically, Introduction, Section V.c. entitled “Structural Materials” states:

The information provided on structural materials MUST BE (emphasis added) consistent with the application of accepted design criteria, codes, standards and specifications selected for the storage cask system. For example, if the applicant elects to use design criteria from Section III of the ASME B&PV Code, the materials selected for the cask must be consistent with those allowed by the ASME Code subsection related to the design. Acceptable requirements include the ASME-adopted specifications given in Section II, Part A, “Ferrous Metals”; Part B, “Nonferrous metals”; Part C, “Welding Rods, Electrodes and Filler Metals”; and Part D, “Properties.”

Similar language is in NUREG – 1617, the “Standard Review Plan for Transportation Packages for Spent Nuclear Fuel” Section 2.4.2, which states that “Materials properties should meet the material specifications applicable to the codes and standards used for the design and fabrication of the package.” Again, it has always been our understanding that if the ASME Code (or other code) was used for design, the materials must meet ASME (or other code) requirements for structural materials. We have always understood that some code or standard must be met for structural material and that proprietary material that has not been subject to critical, independent, industry review was not permitted for use as structural material. .

Further, when NAC attempted to use a high strength low alloy steel (SA 537) in a high temperature structural application for the first time, [my understanding is that](#) a Code Case was needed, which we sought and obtained (Code Case 707). This substantiates our understanding that it was the NRC’s position that structural material required certification from a recognized body, such as ASME. Clearly it appears that the NRC practice and requirements have been that an applicant needs to use material recognized by the Code that is selected for use in the design. This has always been NAC’s understanding, backed up by years of interaction with the staff. This is consistent with our understanding that the NRC does not want to get in front of a national code committee in approving materials for important nuclear applications and safety functions (if there is an applicable code committee).

We will continue to look for additional documentation to support our discussion with you. It may take a little time to uncover some of the older documents from off-site storage.

Best regards,

Craig

Senior Vice President
NAC International

E-mail Properties

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Subject: FW: Use of Aluminum Alloys and/or ICode Materials for Structural Applications

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