

November 19, 2010

U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2738

Attn: Document Control Desk

**Subject:** Submittal of Supplemental Information to Amend the U.S. Nuclear Regulatory Commission Certificate of Compliance No. 1031 for the NAC International MAGNASTOR® Cask System

Docket No. 72-1031

- References:**
1. U.S. Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) No. 1031 for the NAC International MAGNASTOR Cask System, Amendment No. 0, February 4, 2009
  2. MAGNASTOR Cask System Final Safety Analysis Report (FSAR), Revision 0, NAC International, February 2009
  3. Submittal of a Request to Amend the U.S. Nuclear Regulatory Commission Certificate of Compliance No. 1031 for the NAC International MAGNASTOR Cask System, NAC International, March 22, 2010
  4. Resubmittal of a Request to Amend the U.S. Nuclear Regulatory Commission Certificate of Compliance No. 1031 for the NAC International MAGNASTOR Cask System, NAC International, March 30, 2010
  5. Submittal of Response to RAI to NAC's Request to Amend the U.S. Nuclear Regulatory Commission Certificate of Compliance No. 1031 for the NAC International MAGNASTOR Cask System, NAC International, November 10, 2010

NAC International (NAC) hereby submits a supplemental page to Reference 4. On Page 10.1-15 of Reference 2, the first bullet was updated to reflect the various <sup>10</sup>B areal densities for use with PWR and BWR baskets previously submitted as part of Reference 4. The modified text does not present a new change. It is provided to ensure consistency within the MAGNASTOR FSAR.

Since Section 10.1.6.4.5 is incorporated into the MAGNASTOR CoC Technical Specification by reference, it may not be altered without NRC approval. Therefore, NAC hereby requests the incorporation of this supplemental page into MAGNASTOR Amendment 2. Other affected text in the FSAR will be updated via the 72.48 Determination process after approval of Amendment 2.

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Consistent with NAC administrative practice, this proposed FSAR revision is numbered Revision 10C to uniquely identify the changed page. Revision bar marks the FSAR text change on the Revision 10C Page 10.1-15. A Revision 10A backing page is provided for easy insertion into the application. Since this change affects only a single page of the MAGNASTOR FSAR, NAC elected not to provide this supplemental information as an FSAR section. The Table of Contents is not affected. No List of Effective Pages is provided with this changed page.

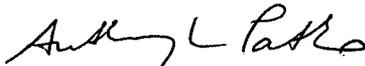
Upon approval of References 4, 5 and this supplemental information, NAC will update the MAGNASTOR FSAR and assign to it the next sequential revision number.

This submittal includes eight copies of this transmittal letter and the Revision 10C changed page to the Reference 2 FSAR. The changed page incorporates the previously requested amendment.

Approval of this amendment to Reference 1 and the issuance of the draft CoC/Safety Evaluation Report are requested by November 30, 2010, to support fabrication and equipment delivery schedules planned for 2010 - 2011. Applying the Direct Final Rulemaking process, the estimated/desired Direct Final Rule effective date is May 31, 2011.

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

Sincerely,



Anthony L. Patko  
Director, Licensing  
Engineering

Enclosure: Page 10.1-15 of MAGNASTOR FSAR, Revision 10C

2. These defects are distributed randomly or systematically over the material, or in a manner that is conservative for the design analysis.
3. The total of such defective areas amounts to (100-x) percent of the neutron absorber material area, where x is the probability level used for determining the lower tolerance limit.

Alternately, apply more rigorous statistical criteria for lot acceptance, i.e., increase the factor K in the following expression.

Lower tolerance limit = average of sample – K \* standard deviation of sample  $\geq$  Technical Specification areal density acceptance criterion,

where, K is the one-sided tolerance limit factor for a normal distribution with a specified sample size, probability and confidence.

The value of K should be increased to compensate for the decreased standard deviation that results from using a larger neutron beam to examine a material that has defect areas with a characteristic dimension of 1.2 cm.

- Based on the MAGNASTOR required  $^{10}\text{B}$  minimum effective areal densities for the PWR basket of 0.036, 0.030 or 0.027 g/cm<sup>2</sup>, the  $^{10}\text{B}$  minimum effective areal densities for the BWR basket of 0.027, 0.0225 or 0.020 g/cm<sup>2</sup>, and the 90% credit applied for borated aluminum alloys and for borated metal matrix composites, a required minimum areal density for the as-manufactured neutron absorber sheets is established.
- Test locations/coupons shall be well distributed throughout the lot of material, particularly in the areas most likely to contain variances in thickness, and shall not contain unacceptable defects that could inhibit accurate physical and test measurements.
- The sampling plan shall require that each of the first 50 sheets of neutron absorber material from a lot, or a coupon taken therefrom, be tested. Thereafter, coupons shall be taken from 10 randomly selected sheets from each set of 50 sheets. This 1 in 5 sampling plan shall continue until there is a change in lot or batch of constituent materials of the sheet (i.e., boron carbide powder or aluminum powder) or a process change. A measured value less than the required minimum areal density of  $^{10}\text{B}$  during the reduced inspection is defined as nonconforming, along with other contiguous sheets, and mandates a return to 100% inspection for the next 50 sheets. The coupons are indelibly marked and recorded for identification. This

- identification will be used to document the neutron absorber material test results, which become part of the quality record documentation package.
- The minimum areal density specified shall be verified for each lot at the 95% probability, 95% confidence level (also expressed as 95/95 level) or better. The following illustrates one acceptable method.

The acceptance criterion for individual plates is determined from a statistical analysis of the test results for that lot. The minimum  $^{10}\text{B}$  areal densities determined by neutron attenuation are converted to volume density, i.e., the minimum  $^{10}\text{B}$  areal density is divided by the thickness at the location of the neutron attenuation measurement or the maximum thickness of the coupon. The lower tolerance limit of  $^{10}\text{B}$  volume density is then determined—defined as the mean value of  $^{10}\text{B}$  volume density for the sample, less K times the standard deviation, where K is the one-sided tolerance limit factor for a normal distribution with 95% probability and 95% confidence.

Finally, the minimum specified value of  $^{10}\text{B}$  areal density is divided by the lower tolerance limit of  $^{10}\text{B}$  volume density to arrive at the minimum plate thickness that provides the specified  $^{10}\text{B}$  areal density.

Any plate that is thinner than this minimum or the minimum design thickness, whichever is greater, shall be treated as nonconforming, with the following exception. Local depressions are acceptable, as long as they total no more than 0.5% of the area on any given plate and the thickness at their location is not less than 90% of the minimum design thickness.

- All neutron absorber material acceptance verification will be conducted in accordance with the NAC International Quality Assurance Program. The neutron absorber material supplier shall control manufacturing in accordance with the key process controls via a documented quality assurance system (approved by NAC or NAC's approved fabricator), and the designer shall verify conformance by reviewing the manufacturing records.
- Nonconforming material shall be evaluated within the NAC International Quality Assurance Program and shall be assigned one of the following dispositions: "Use-As-Is," "Rework/Repair" or "Reject." Only material that is determined to meet all applicable conditions of the license will be accepted.