

June 17, 2010

Mr. Anthony Patko
Director, Licensing
Engineering
NAC International
3930 East Jones Bridge Road, Suite 200
Norcross, GA 30092

SUBJECT: LETTER AUTHORIZATION FOR THE MODEL NO. NAC-LWT (COC NO. 9225)

Dear Mr. Patko:

As requested by your application dated May 11, 2010, as supplemented May 27, 2010, pursuant to Title 10 of the Code of Federal Regulations Part 71, Certificate of Compliance (CoC) No. 9225, for Model No. NAC-LWT package, is amended as follows:

Authorization to permit the optional use of a TRIGA fuel element positioning device (fuel cell divider) in the fuel cells of TRIGA baskets when shipping General Atomic (GA) TRIGA fuel elements in the NAC-LWT package for 12 months with the following exceptions:

1. The use of the fuel cell divider is to facilitate loading and positioning of some of the TRIGA and dummy fuel elements.
2. The axial positioning device will be fabricated of 14 gauge 304 stainless steel and will fit inside the fuel cell.
3. The fuel cell divider will allow the ability to load 4 rods per basket fuel cell opening.
4. The weight of the fuel cell divider shall not exceed 20 pounds.

The following additional conditions apply:

- All other conditions of CoC No. 9225 shall remain the same.
- This authorization shall expire on June 30, 2011.

A. Patko

-2-

If you have any questions regarding this authorization, please contact me or Kim Hardin of my staff at (301) 492-3339.

Sincerely,

/RA/

Eric J. Benner, Branch Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9225
TAC No. L24446

cc: R. Boyle, Department of Transportation
J. Shuler, Department of Energy

A. Patko

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Safety Evaluation Report

Request for Authorization to Use Element Positioning Device in the TRIGA Basket

**Certificate of Compliance No. 9225, Revision 55
Model No. NAC-LWT
Docket 71-9225**

SUMMARY

By application dated May 11, 2010, as supplemented May 27, 2010, NAC International (NAC or the applicant) requested an authorization to Certificate of Compliance (CoC) No. 9225 for the Model No. NAC-LWT. NAC's request was for permission for the optional use of a TRIGA fuel element positioning device (fuel cell divider) in the fuel cells of TRIGA baskets when shipping General Atomic (GA) TRIGA fuel elements in the NAC-LWT package for 12 months.

This request is necessary to support package loading operations and the established shipment schedule for the GA shipments of high enriched uranium to the Idaho National Laboratory. CoC No. 9225 has been amended by letter based on the statements and representations in the application, and staff agrees that the changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

GENERAL INFORMATION

By application dated May 11, 2010, as supplemented May 27, 2010, NAC requested the following authorization to Certificate of Compliance (CoC) No. 9225 for the Model No. NAC-LWT.

Authorization to permit the optional use of a TRIGA fuel element positioning device (fuel cell divider) in the fuel cells of TRIGA baskets when shipping General Atomic (GA) TRIGA fuel elements in the NAC-LWT package for 12 months with the following exceptions:

1. The use of the fuel cell divider is to facilitate loading and positioning of some of the TRIGA and dummy fuel elements.
2. The axial positioning device will be fabricated of 14 gauge 304 stainless steel and will fit inside the fuel cell.
3. The fuel cell divider will allow the ability to load 4 rods per basket fuel cell opening.
4. The weight of the fuel cell divider shall not exceed 20 pounds.

STRUCTURAL

The request for authorization proposes to use the TRIGA element positioning device (fuel cell divider) to facilitate loading of the fuel element assemblies into the packaging.

In the May 27, 2010, letter NAC presents an evaluation of structural effects of loading fuel elements with the divider on the package free-drop performance for the normal conditions of transport and the hypothetical accident conditions. A sketch is also provided to depict physical attributes of the 26-inch long, 14-gage 304 stainless steel weldment weighing 20 lbs maximum. The 3.2-inch square cross-sectional footprint of the divider, which is the same as that of the approved damaged fuel can, fits the basket fuel cell with a 3.38-inch square minimum opening.

The NAC evaluation focused on comparing the free-drop inertia force associated with the divider-loaded fuel elements configuration to that with the damaged fuel can. The staff reviewed the evaluation by noting that, as described in Section 2.6.12.7.4 of the application, a design basis weight of more than 23 lb had been considered for the damaged fuel can in addition to the fuel element assemblies in determining the combined inertia force for demonstrating package structural adequacy. The proposed maximum divider weight of 20 lbs is bounded by a previously evaluated design basis weight of 23 lb. Hence, the staff agrees with NAC's conclusion that use of the fuel cell divider to load fuel element assemblies has no negative impact on the structural performance of the package.

On the basis of the review above, the staff concludes that using the fuel cell divider to facilitate loading of the instrumented fuel element assemblies will have no inadvertent structural effects on the package for meeting the free drop tests criteria of 10 CFR 71.71(c)(7) and 71.73(c)(1).

CRITICALITY

Staff reviewed the proposed axial positioning device for use in the TRIGA fuel basket to facilitate loading and positioning of both TRIGA and dummy fuel elements within a fuel cell for the GA shipments. The fuel cell divider design is a stainless steel cruciform blade that fits inside of a fuel cell of the TRIGA basket and will allow up to four rods to be loaded per basket opening.

The applicant provided a brief re-evaluation of the maximum reactivity case with a fuel cell divider inserted in all cells to demonstrate a reduction in the system reactivity using the SCALE 4.4a system of codes with the 27 group cross-section set in ENDF/BIV. Staff performed independent calculations of the maximum reactivity case with fuel cell dividers inserted into all positions of a TRIGA basket contained in a NAC-LWT package with the SCALE 6 system of codes using the v7-238 cross-section set. The independent calculations varied the interior moderator of the system both with and without the fuel cell divider inserted and found that the resulting reduction in system reactivity agreed well with the results obtained by the applicant. Staff also performed calculations to determine the impact of individual fuel cell dividers and confirmed that each addition of a divider reduces the system reactivity of the NAC-LWT cask in the bounding array analysis.

Based on the information provided by the applicant both in the initial letter and the subsequent RAI response, as well as the results of the independent confirmatory calculations, staff finds that the addition of the proposed fuel cell divider as an option for loading and shipping the GA TRIGA fuel for the specified period is acceptable under 10 CFR Part 71.

CONDITIONS

Authorization to permit the optional use of a TRIGA fuel element positioning device (fuel cell divider) in the fuel cells of TRIGA baskets when shipping General Atomic (GA) TRIGA fuel elements in the NAC-LWT package for 12 months with the following exceptions:

1. The use of the fuel cell divider is to facilitate loading and positioning of some of the TRIGA and dummy fuel elements.
2. The axial positioning device will be fabricated of 14 gauge 304 stainless steel and will fit inside the fuel cell.
3. The fuel cell divider will allow the ability to load 4 rods per basket fuel cell opening.
4. The weight of the fuel cell divider shall not exceed 20 pounds.

The following additional conditions apply:

- All other conditions of CoC No. 9225 shall remain the same.
- This authorization shall expire on June 30, 2011.

CONCLUSION

CoC No. 9225 has been amended by letter for a 12 month authorization use of a TRIGA fuel element positioning device (fuel cell divider) in the fuel cells of TRIGA baskets when shipping General Atomic (GA) TRIGA fuel elements in the NAC-LWT package. This authorization expires June 30, 2011.

Based on the statements and representations in the application, and with the conditions listed above, the staff agrees that this change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

This authorization has no impact on the thermal, containment, or shielding performance of the NAC-LWT package.

Issued on June 17, 2010.