March 30, 2010

Mr. Patrick L. Paquin
General Manager – Engineering
and Licensing
Energy*Solutions*
140 Stoneridge Drive
Columbia, SC 29210

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9168 FOR THE MODEL NO. CNS 8-120B

Dear Mr. Paquin:

As requested by your application dated February 3, 2010, as supplemented on March 24, 2010, enclosed is Certificate of Compliance No. 9168, Revision No. 17, for the Model No. CNS 8-120B package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's Safety Evaluation Report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471. Registered Users may request by letter to remove their names from the Registered Users List.

If you have any questions regarding this certificate, please contact me or Michele Sampson of my staff at (301) 492-3300.

Sincerely,

/RA/

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

Docket No. 71-9168
TAC No. L24415 and L24433

Enclosures:
1. Certificate of Compliance No. 9168, Rev. No. 17
2. Safety Evaluation Report
3. Registered Users List

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy
Registered Users

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DISTRIBUTION: **(Closes TAC L24415 and L24433)**
SFST r/f
G:\SFST\Part 71 Casework\71-9168.ltr&ser.doc and 71-9168.r17.doc **ADAMS Accession (Package) No.: ML100910052**

OFC:	SFST	E	SFST		SFST		SFST		SFST		SFST	
NAME:	MSampson		GHornseth		GBjorkman		CRegan		LCampbell		MDeBose	
DATE:	3/25/2010		3/25/2010		3/29/2010		3/25/2010		3/29/2010		3/30/2010	
OFC:	SFST											
NAME:	EBenner											
DATE:	3/30/2010		/ /		/ /		/ /		/ /		/ /	

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SAFETY EVALUATION REPORT

Docket No. 71-9168
Model No. CNS 8-120B
Certificate of Compliance No. 9168
Revision No. 17

SUMMARY

By application dated February 3, 2010, as supplemented on March 24, 2010, Energy*Solutions* requested renewal and a revision of Certificate of Compliance No. 9168, for the Model No. CNS 8-120B package. Energy*Solutions* requested the inclusion of a repair method for damage to bolt-hole threads. The damage to the bolt-hole threads was identified by Energy*Solutions* during routine inspection of a packaging. Energy*Solutions* provided revised drawings to add notes allowing the optional use of threaded inserts at various bolt-hole locations. The operating procedure for the package was revised to include instructions for inspection of bolts and bolt-holes prior to use. Additionally, the maintenance section of the application was revised to include instructions for installation and testing of the threaded insert.

NRC staff evaluated the Model No. CNS 8-120B package and documented the security assessment review separately, as it contains sensitive information that cannot be made publicly available. The security assessment should be reviewed prior to approval of any amendment to this application.

NRC staff reviewed the application using the guidance in NUREG 1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representations in the application, the staff finds that the changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71. The Certificate has been renewed for a five year term.

EVALUATION

The applicant proposed to use threaded inserts (such as the trademarked Heli-Coil) to repair stripped or worn tapped (threaded) holes on the model CNS 8-120B transportation package. This repair method was proposed for immediate application to one damaged package and also for unlimited future use as needed. The specific application was for the lid bolts and the lifting trunnion bolts. No limit as to the number of permitted inserts was proposed.

As specified by the applicant, threaded inserts would have a minimum tensile strength of 150 ksi and be made from either type 304 stainless steel, Inconel X750, or Nitronic 60. Inconel X750 is a nickel-based alloy and Nitronic 60 is a manganese-bearing austentitic stainless steel.

The staff reviewed open technical literature regarding threaded inserts. Threaded inserts are widely used in industry, both as a repair method for stripped/worn threaded holes and for

original manufacture in situations where higher strength or wear resistant threaded holes are required. A typical use is in aluminum components. There, threaded inserts provide both extra strength to the tapped threads and also greatly enhanced thread wear resistance in components requiring frequent disassembly/reassembly.

For the CNS 8-120B package, the tensile strength of the thread inserts significantly exceeds that of the carbon steel plate used to fabricate the different important-to-safety (ITS) components of the package which would be repaired by this method. In addition to the high strength, the inserts are made from austenitic stainless or nickel-base alloys, thus, no brittle fracture issues exist. Consequently the staff finds that no degradation in threaded connection strength would result from the use of inserts.

Material compatibility was assessed by the staff to ensure that no adverse chemical reaction or galvanic corrosion would occur as a result of threaded insert use. The three materials specified for the threaded inserts are all corrosion resistant materials. Normal service conditions for the package are atmospheric exposure. This is a very mild condition from the potential corrosion standpoint. Thus, normal conditions would not pose a challenge to the repaired/modified package with respect to corrosion effects.

An accident involving fire could result in annealing (softening) of the threaded insert material, depending on the duration of fire exposure and the temperature reached by the material. Annealing of the threaded insert material would reduce the tensile strength of the insert. However, the bolt material and bolt hole plate material are more susceptible to annealing effects than the insert materials. This makes the annealing effect of the threaded insert immaterial compared to the bolt and plate material. Consequently, no new failure mode is introduced and threaded joint performance would not be altered under such accident conditions by the use of threaded inserts. A post accident inspection is required and a test of the inserts (a torque or load test) would demonstrate continued fitness for use. If required, the inserts are easily removed and replaced.

An accident involving water immersion would not result in any significant degradation of the threaded insert materials. Each of the materials is very resistant to corrosion in water. Potential galvanic corrosion, due to the dissimilar metal coupling of the threaded inserts and the base material (carbon steel) would be insignificant during a limited exposure time as might occur for an accident. Thus, the staff finds that no significant corrosion issues would result from use of the threaded inserts.

The applicant stated that any thread repair would be tested to ensure that the necessary bolt torque could be achieved, thus verifying the efficacy of the repair. The lifting trunnions would also be subjected to a proof load test to further verify the strength of the thread repair. The staff found this testing to be an acceptable means to verify the repair method.

During a phone conversation with the applicant, the applicant stated that the procurement of any threaded insert would follow their approved QA/QC plan for ITS materials or components.

The staff finds that the proposed repair method will not result in any degradation in the performance of the transportation package. Thus, the staff finds that the use of threaded inserts as proposed by the applicant is acceptable.

CONDITIONS

The following changes have been made to the Certificate:

Condition No. 5(a)(3) has been revised to incorporate Revision No. 13 of Chem-Nuclear Systems, Inc., Drawing No. C-110-E-0007, Sheets 1, 2, and 3.

Condition No. 9 has been revised to require use of Sections 7 and 8 of the application, as supplemented.

New Condition No. 11 was included in the Certificate of Compliance to clarify that the package is subject to the provisions of 10 CFR 71.19(b), which requires that all fabrication of this package must have been completed by April 1, 1999.

As a consequence of the inclusion of the new Condition No. 11, the previous Condition Nos. 11-13 was renumbered 12-14, respectively.

Condition No. 13, which authorizes use of the previous revision of the certificate for a period of approximately one year, was revised to allow use of Revision No. 16 until March 31, 2011.

Condition No. 14 was changed to reflect the new expiration date, June 30, 2015.

CONCLUSION

The Certificate has been renewed for a five year term which expires on June 30, 2015. Based on the statements and representations in the application, as supplemented, and the conditions listed above, the staff concludes that the Model No. CNS 8-120B package design has been adequately described and evaluated and that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9168, Revision No. 17 on

March 30, 2010 .