

August 19, 2008

Mr. Richard E. Campbell
Corporate Director, Quality Assurance
EnergySolutions
140 Stoneridge Drive
Columbia, South Carolina 29210

SUBJECT: NRC INSPECTION REPORT 71-0935/2008-201 AND NOTICE OF VIOLATION

Dear Mr. Campbell:

On August 6 and 7, 2008, the U.S. Nuclear Regulatory Commission (NRC) performed an announced special team inspection of EnergySolutions (ES) at their facility in Columbia, South Carolina. The inspection was performed to assess ES's response, through their corrective action program, to three separate occurrences in which loose base plate bolts were identified in a cask used in shipments made to ES's Barnwell, South Carolina, facility. Specifically, the loose bolts were associated with the Model No. CNS 3-55 cask for which ES holds NRC Certificate of Compliance No. 5805. The cask base plate is secured to the cask body by twelve base plate bolts and sealed with two silicone O-rings, therefore, the base plate bolts are important to maintaining the cask containment function. Inspection results are detailed in Enclosure 1 to this letter.

As a result of the inspection, the team assessed that ES did not perform adequate cause analysis of the initial loose base plate bolts occurrence in February 2007, and that corrective actions were therefore inadequate in preventing repeat loose bolt occurrences in February and May of 2008. The team noted that, based upon information provided by ES, the loose base plate bolts did not appear to have any adverse consequences with regard to cask performance. However, as documented in the enclosed inspection report, the team identified several instances in which ES organizations displayed an inadequate questioning attitude while addressing the issue of the loose bolts, as well as weaknesses in the sharing of relevant information between ES organizations and locations.

Based on the results of this inspection, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Enclosure 2) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

R. Campbell

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

David W. Pstrak, Chief
Rules, Inspections, and Operations Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-0935

Enclosures:

1. NRC Inspection Report No. 71-0935/2008-201
2. Notice of Violation (Notice)

R. Campbell

-2-

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<u>Distribution:</u>	Docket 71-0935		
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**U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and Safeguards
Division of Spent Fuel Storage and Transportation**

**Inspection Report
EXECUTIVE SUMMARY**

NRC Inspection Report 71-0935/2008-201

On August 6 and 7, 2008, the U.S. Nuclear Regulatory Commission (NRC) performed an announced special team inspection of EnergySolutions (ES) at their facility in Columbia, South Carolina. The inspection was performed to assess ES's response, through their corrective action program, to three separate occurrences in which loose lid bolts were identified in a cask used in shipments made to ES's Barnwell, South Carolina, facility. Specifically, the loose bolts were associated with the Model No. CNS 3-55 cask, unit 3-55-1, for which ES holds NRC Certificate of Compliance No. 5805.

Overall

The team concluded that ES did not perform adequate cause analysis of the initial loose base plate bolts occurrence in February 2007, and that corrective actions were therefore inadequate in preventing repeat loose bolt occurrences in February and May of 2008. The team noted that, based upon information provided by ES, the loose base plate bolts did not appear to have any adverse consequences with regard to cask containment performance. However, the team identified several instances in which ES organizations displayed a poor questioning attitude while addressing the issue of the loose bolts, as well as weaknesses in the sharing of relevant information between ES organizations and locations.

PERSONS CONTACTED

The team held an entrance meeting with ES on August 6, 2008, to present the scope and objectives of the NRC inspection. On August 7, 2008, the team held an exit meeting with ES to present the preliminary results of the inspection. Individuals present at the entrance and exit meetings are listed below in Table 1.

Table 1
Entrance and Exit Meeting Attendees

Name	Title	Entrance Meeting	Exit Meeting
R. Temps	Team Leader, NRC	X	X
J. Pearson	Senior Inspector, NRC	X	X
J. Furia	Inspector, NRC Region I	X	X
R. Campbell	Corporate Director, QA, ES	X	X
P. Paquin	General Manager, ES	X	X
R. Byars	Corporate Manager, QA-Commercial, ES	X	X
D. Kozlowsky	Quality Control Manager, ES	X	X
W. House	VP, Regulatory Affairs, ES	X	X*
E. Garris	QA Manager – Barnwell, ES		X*
M. Gandy	Health Physicist, SCDHEC	X	X

* via teleconference

INSPECTION PROCEDURE USED

86001, "Design, Fabrication, Testing, and Maintenance of Transportation Packagings"

REPORT DETAILS

1. Background

In February 2007, the Nine Mile Point (NMP) facility shipped radioactive material to the Barnwell, South Carolina, waste disposal facility in an EnergySolutions (ES) packaging (also referred to as a cask) CNS 3-55-1 for which ES holds NRC CoC No. 5805. While preparing the cask for disposal, two of the base plate bolts were found to be less than hand tight. The bolts are used to secure the cask lid to the lower support plate and are an integral part of the cask containment function. CoC 5805, Section 9, states that the package shall be prepared for shipment in accordance with the Operating Procedures of Section 7.0 of the application. The Operating Procedures specify a nominal torque value of 75 ft-lbs (foot-pounds) for the base plate bolts. Therefore, the less than hand tight (loose) bolts represented a non-compliance with the requirements of CoC 5805 requirements. ES initiated corrective actions to address the situation. However, in February 2008, the James A. FitzPatrick (JAF) facility made a shipment to Barnwell in the same cask and a loose base plate bolt was found. Further, in May 2008, a shipment from the Susquehanna Steam Electric Station (SSES) facility also arrived at Barnwell with a loose base plate bolt. For all three shipments, the licensees and ES determined that the

cask had been prepared in accordance with the cask operating procedures and that the cask base plate bolts had been torqued to their required value prior to shipment.

2. Details

The team reviewed ES condition reports and also held discussions with ES Quality Assurance (QA) and management personnel regarding the manner in which the three occurrences discussed above were addressed through the ES corrective action program. Results of the team's review are discussed below.

February 2007 Occurrence

In response to the February 2007 occurrence, ES personnel at Barnwell initiated Condition Report (CR) B-07-007 dated February 27, 2007. This CR was treated as a significant condition adverse to quality (SCAQ) in accordance with the ES corrective action system. Per ES procedures, a SCAQ requires the cause of the occurrence to be determined and also action to prevent recurrence.

ES Commercial Services, located in Columbia, South Carolina, initiated CR 07-030 on February 26, 2007. That CR evaluated the loose bolts for reportability under 10 CFR Part 21 and concluded that it was not reportable. The CR also provided directions to the Barnwell personnel on to how to safely proceed with the cask offload. One of the directions provided for the use of a calibrated torque wrench to check the torque of all twelve base plate bolts. Using those directions, six of the twelve bolts were subsequently determined to be under-torqued.

Following the unloading of the cask, as part of their investigation, ES prepared the cask in accordance with the operating procedures and shipped it empty to the NMP facility. Upon receipt at NMP, two base plate bolts were observed to be loose. ES initiated CR 07-034 on March 9, 2007, in response to this condition. The CR was treated as a SCAQ in accordance with the ES corrective action system.

In CR 07-034, ES stated in Section IV of the CR, under "Cause of Occurrence," that, "It is believed that normal wear and tear on the nuts and bolts caused them to loosen in transit." However, the team determined that this cause was not discussed in any of the supporting documentation attached to CR 07-034, nor by any other separate engineering analysis. Therefore, the team concluded that ES's cause for the loose base plate bolts was an unsupported assumption.

Corrective actions for CR 07-034 included replacement of hardware on both CNS 3-55 casks that ES owns, as well as collection of bolt torque data for two subsequent shipments in each of the two casks following replacement of the hardware. No under-torqued bolts were found in the subsequent two shipments of each cask. ES stated that multiple shipments were made following completion of the bolt torque measuring effort and that no loose bolts were identified. The team considered this corrective action to be of limited use, however, because the absence of loose bolts on subsequent did not mean that the bolts were at their required torque value upon cask receipt. Had ES continued to obtain torque values upon cask receipt, a downward trend in the as-found torque values may have been observed prior to a loose bolt being identified in the February 2008

shipment. The team notes that the loose bolt phenomenon has only occurred in cask 3-55-1.

The team noted that CR B-07-007, Section VI, "Verification of Corrective Action" stated to see an attached NMP CR. The attached NMP CR documented that NMP had performed extensive cause analysis and had identified two potential mechanical mechanisms to explain why the loose bolts may have occurred, and had also concluded that an apparent design deficiency may have led to the loose bolts. The team also noted that the NMP CR documented that NMP shipped the empty cask back to Barnwell on March 17, 2007, and that one bolt was found to be at significantly less than the design torque value of 75 ft-lbs. The team was informed that ES Barnwell personnel did not write a CR for this occurrence because it involved an empty shipment. The team noted that Section V, "Concurrence" of CR B-07-007 was signed off by Barnwell QA, as well as by a licensing manager, as "accepted." However, significant information contained in the NMP CR was not addressed or acknowledged in the Barnwell CR, nor was it apparently shared with ES Commercial Services QA and engineering personnel. The team considered this to be a serious lack of questioning attitude by the ES Barnwell personnel.

The team noted that ES Commercial Services CR 07-034 was initiated on March 9, 2007, and closed seventeen days later on March 26, 2007. However, the ES Barnwell CR, B-07-034, remained open until May 18, 2007, during which time NMP was completing their investigative efforts in coordination with ES Barnwell. The team questioned how the ES Commercial Services group could have completed and closed out their CR for the loose bolts issue in approximately two weeks, while the investigative effort by NMP and ES Barnwell was still ongoing and was not completed for almost another three months. ES Commercial Services personnel were apparently unaware of the NMP investigative effort, and as discussed previously, the Barnwell personnel did not share the NMP CR with ES Commercial Services personnel when it was received. Different parts of the ES organization appeared to be addressing different aspects of the loose bolts issue, yet no single group or person maintained a coordinated overview of ES's overall response. The team considered this to be a weakness in ES's corrective action system in that information for an event involving cross-cutting issues (engineering, design and operations) was not appropriately shared among the different QA and organizational groups within ES.

The team noted that in a voluntary 10 CFR 71.95 report (ML071410129) issued by NMP on May 4, 2007, NMP stated that "It is believed that the torquing of the impact limiter bolts to the 100-150 ft-lb range causes additional compression of the base plate which could lead to relief of the 75 ft-lb pretensioning of the base plate bolts." That report was sent to ES's Commercial Services group. Given that NMP's cause of condition, as stated in the 71.95 report, differed from that contained in ES's CR 07-034, the team questioned ES Commercial Services personnel as to their response to the conflicting cause determinations. The team was informed that ES Commercial Services had previously completed their root cause and considered that further evaluation was not required. The team considered this to be a lack of a questioning attitude on the part of ES Commercial Services personnel, particularly in light of the fact that the NMP 71.95 report identified a different cause mechanism that had not been formally discussed or evaluated in CR 07-034.

The team identified that an ES Commercial Services manager had sent an e-mail, dated February 27, 2007, that essentially discussed the same mechanism described in the NMP 71.95 report as a potential possibility for the loosening of the base plate bolts. The manager recommended in the e-mail that the bolts used to secure the impact limiter to the cask be torqued to 50 + or – 5 ft-lbs and that this be captured in the relevant operating procedure. However, the possible cause mechanism mentioned in the e-mail was not discussed at all in CR 07-034, nor was the action to change the operating procedure documented as a formal corrective action in the CR. Further, the requested change to the procedure had yet to be implemented when the second loose bolt event occurred a year later in February 2008.

February and May 2008 Occurrences

With regard to the February 2008 occurrence, involving a shipment from the JAF facility, two CRs were generated by the ES Barnwell organization. CR B-08-014, initiated February 15, 2008, evaluated the issue for Part 21 reportability and basically contained the same justification used in CR 07-030 to conclude that the issue was not reportable under 10 CFR Part 21. The second CR, B-08-015, initiated on February 20, 2008, while generated by ES Barnwell, was assigned to the JAF facility to respond to. Section IV of the CR, under “Cause of Occurrence” stated to “see attached.” The attached document was a one page document dated February 21, 2008, that listed the cause of the occurrence and actions required to prevent recurrence. However, the team noted that the cause of occurrence was simply a description of the how the cask was prepared for shipment at JAF. The CR contained no cause evaluation for why the bolt loosened even though the CR was handled as a SCAQ that requires cause evaluation.

The actions to prevent recurrence, also discussed in the one page document, described a process of checking the cask lid bolt torques twice on initial tightening, and then once again once the cask is placed in the horizontal position. The basis for this corrective action was not discussed in the CR.

The team concluded that for the second event, ES’s response was inadequate because they failed to perform the actions required of a SCAQ, and that Barnwell QA and licensing personnel signed off on the CR without questioning the adequacy of the cause of occurrence or the basis for the actions to prevent recurrence.

The team questioned ES Columbia Services personnel as to their response to the second event as they did have knowledge that the issue had occurred. The team was informed that when the February 2008 event occurred, it was viewed as an isolated event given that the package had been used for a year since corrective actions were implemented from the 2007 event without any loose bolts being found. The team assessed this to be an inadequate response in that the recurrence of an issue that had supposedly been addressed through corrective actions for a previous SCAQ should have resulted in the ES Columbia Services generating a CR to formally document and evaluate the issue as to why it had recurred. The need for such a response was further supported given that a loose bolt was found three months later in a May 2008 on a shipment from the SSES in the same cask. That occurrence was documented in Barnwell CR B-08-030 initiated on June 4, 2008. Only after that event, and following extensive interaction with the licensee as well as NRC staff, did ES undertake further formal review of the issue and implement changes to the CoC 5805 referenced operating procedure to specify torque values for the

impact limiter bolts as well as other operating measures. Since the implementation of those measures, no other loose bolts have been identified in the limited number of shipments that have been made in the 3-55-1 packaging. It should be noted that use of the two Model No. 3-55 casks will not be allowed after October 1, 2008, due to a 2004 change in the 10 CFR Part 71 regulations.

3. Conclusions

The team concluded that ES did not perform adequate cause analysis of the initial loose base plate bolts occurrence in February 2007, and that corrective actions were therefore inadequate in preventing repeat loose bolt occurrences in February and May of 2008. The team noted that, based upon information provided by ES, the loose base plate bolts did not appear to have any adverse consequences with regard to cask containment performance. However, the team identified several instances in which ES organizations displayed a poor questioning attitude while addressing the issue of the loose bolts, as well as weaknesses in the sharing of relevant information between ES organizations and locations.

Based on the results of the inspection, a violation of NRC requirements was identified. Specifically: 10 CFR 71.133, "Corrective action," states, in part, "The certificate holder shall establish measures to assure that conditions adverse to quality are promptly identified and corrected. In the case of a significant condition adverse to quality, the measures must ensure that the cause of the condition is determined and corrective actions taken to preclude repetition."

Contrary to the above, the NRC identified that:

- 1) With regard to the occurrence of loose base plate bolts, treated as a SCAQ, associated with a February 2007 shipment in the ES CNS 3-55-1 cask, ES did not adequately determine the cause of the condition, and the corrective actions taken were not effective in preventing recurrence because loose base plate bolts were identified with shipments made in the same cask in February and May of 2008.
- 2) With regard to the occurrence of a loose base plate bolt, treated as a SCAQ, for the February 2008 shipment in the ES CNS 3-55-1 cask, ES did not take action to determine the cause of the condition, and the corrective actions taken were not effective in preventing recurrence because a loose base plate bolt was identified with a shipment made in the same cask in May of 2008.

NOTICE OF VIOLATION

EnergySolutions
Columbia, South Carolina

Docket 71-0935

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted on August 6 and 7, 2008, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violations are listed below:

- A. 10 CFR 71.133, "Corrective action," states, in part, "The certificate holder shall establish measures to assure that conditions adverse to quality are promptly identified and corrected. In the case of a significant condition adverse to quality (SCAQ), the measures must ensure that the cause of the condition is determined and corrective actions taken to preclude repetition."

Contrary to the above, the NRC identified that:

- 1) With regard to the occurrence of loose base plate bolts, treated as a SCAQ, associated with a February 2007 shipment in the ES CNS 3-55-1 cask, ES did not adequately determine the cause of the condition and the corrective actions taken were not effective in preventing recurrence because loose base plate bolts were identified with shipments made in the same cask in February and May of 2008.
- 2) With regard to the occurrence of a loose base plate bolt, treated as a SCAQ, for the February 2008 shipment in the ES CNS 3-55-1 cask, ES did not take action to determine the cause of the condition, and the corrective actions taken were not effective in preventing recurrence because a loose base plate bolt was identified with a shipment made in the same cask in May of 2008.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, ES is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to David W. Pstrak, Chief, Rules, Inspections and Operations Branch, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. Where good cause is shown, consideration will be given to extending the response time.

Enclosure 2

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), <http://www.nrc.gov/NRC/ADAMS/index.html> to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, (the Public Electronic Reading Room). If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 19th day of August, 2008.