

# NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68  
Dickerson, Maryland 20842 USA  
301-349-5001 FAX: 301-349-2433  
e-mail: neutronprod@erols.com

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ATTN: Document Control Desk  
Director, Division of Spent Fuel Management  
Office of Nuclear Material Safeguards and Security  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555-0001

To Whom It May Concern:

As required by 10CFR71, (71.95), Neutron Products, Inc. is submitting this report to describe the condition of a non-conforming package component that was identified during an inspection of that component that was performed at our facility in Dickerson, MD on August 10, 2015. The requirements in **71.95, Reports**, and responses are referenced by letter and number as follows:

***(c) (1) A brief abstract describing the major occurrences during the event, including all component or system failures that contributed to the event and significant corrective action taken or planned to prevent recurrence.***

There were no component failures that contributed to this event.

The component is the metal outer shell of overpack OP-8 which is part of the Certificate of Compliance USA/9215/B(U) packaging. A dent was noticed during pre-shipment activities prior to a shipment made in June, 2015. A subsequent inspection during another pre-shipment activity had the same results. It was determined that the dent was less than 1/2" in depth and that the component was conforming. Prior to a third shipment, during pre-shipment preparations, it was determined that there was an area at the bottom of the dent which was actually a small tear.

Although it is possible that, at the time of the prior two shipments using this package, the tear did not exist, we believe that it is much more likely that the damage was initially misdiagnosed to be only a dent. Once the tear was identified, the package was tagged as non-conforming and taken out of service. Corrective action CA-2015-RT-005 has been opened and includes repair of the component and retraining of personnel concerning maintenance and shipping procedures. In addition, the ultimate cause of the damage was most likely a forklift operator, not employed by Neutron, attempting to push the package using forklift forks on the metal sidewall. As the packages are not always under our control, various types of preventive action intended to prevent a recurrence of this problem are under consideration.

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***(c) (2) (i) Status of components or systems that were inoperable at the start of the event and that contributed to the event.***

There were no components or systems of the packaging that were inoperable at the start of the event.

***(c) (2) (ii) Date and approximate times of occurrences.***

June 11, 2015 - OP-8 underwent annual inspection.

June 17, 2015 - Package was shipped empty to a hot cell for loading, no damages found.

June 23, 2015 - Package was used to ship a cesium-137 source containing 1,346 curies. No damages during pre-shipment inspection. After loading on truck, loading personnel requested an inspection of a dent at the bottom of the outer metal shell. Dent was less than ½ inch in depth and no tear was noticed. Dent was believed to be caused by the personnel loading the package onto the truck. Package was shipped to SwRI in San Antonio, Texas.

July 27, 2015 - After return of the empty package, no tear was observed.

July 29, 2015 - Package was used to ship a cobalt-60 source containing 603 curies. During pre-shipment activities, the dent was less than ½ inch, no tear was noticed. Package was shipped to SwRI in San Antonio, Texas.

August 10, 2015 - After return of the empty package, in preparation for another package use, inspection personnel noticed that a portion of the dent was actually a small tear. While it is possible that the tear developed during use between July 29 and August 10, or that another forklift operator hit the package in the same place as the original damage, thereby converting the dent into a tear, we believe it more likely that the original damage was not properly assessed. The package was tagged as non-conforming and removed from service.

***(c) (2) (iii) The cause of each component or system failure, or personal error, if known.***

The dent was believed to be caused by the personnel loading the package onto the truck. It is likely that they used the tips of the forklift forks to push the package on the lower area of the outer metal shell in order to move it further into the truck.

The nonconforming shipments were caused by Neutron personnel misidentifying the damage as a dent rather than a small tear.

***(c) (2) (iv) The failure mode, mechanism, and effect of each failed component, if known.***

As described above, the damage was most likely caused by improper handling of the package. There were no failures of the function of the package and no practical effect on the safety of the package resulting from this deficiency.

***(c) (2) (v) A list of systems or secondary functions that were also affected for failures of components with multiple functions.***

There were no failures of components that occurred as result of this event, and no other systems or secondary functions were adversely affected.

***(c) (2) (vi) The method of discovery of each component or system failure or procedural error.***

The resulting tear in the outer metal shell sidewall was discovered by visual inspection on August 10, 2015.

***(c) (2) (vii) For each human performance related root cause, a discussion of the cause(s) and circumstances.***

Personnel that handle this packaging are often not trained under our QA program, ie. common carrier hubs, dock personnel, and brokers both domestic and foreign. Dents are likely to occur if personnel use a forklift to push on the outer metal shell sidewall.

It is possible that the tear was not initially detected because it was pushed up against the wooden inner jacket, making it more difficult to identify. With the wooden inner jacket removed, the tear was more apparent as light was passing through the slit in the shell. The wooden inner jacket was removed from the metal shell during the June 11, 2015 annual inspection (before the damage was present) and during the August 10, 2015 pre-shipment inspection. This is more of a confounding factor rather than a complete explanation because, although the tear was easier to see with the wooden inner jacket removed, it was still readily apparent upon close visual inspection in its original configuration with the tear pressed up against the wooden inner jacket.

***(c) (2) (viii) The manufacturer and model number (or other identification) of each component that failed during the event.***

The package component is the outer metal shell of overpack OP-8. The manufacturer of the overpack was Danzer Metal Works of Hagerstown, MD. As noted in (c) (2) (iv), there was no failure of the function of any package components.

***(c) (2) (ix) For events occurring during use of a packaging, the quantities and chemical and physical form(s) of the package contents.***

The package used for the shipments after the dent was noticed and before the tear was identified contained:

- 1,346 curies of cesium-137, special form; and,
- 603 curies of cobalt-60, special form.

***(3) An assessment of the safety consequences and implications of the event. This assessment must include the availability of other systems or components that could have performed the same function as the components and systems that failed during the event.***

The shipments were conducted safely and there were no safety consequences as a result of the shipments. In assessing the safety implications, consideration should be given to the fact that the outer metal shell can perform its safety function even though there are openings in it. For example, the sidewall of the overpack has a total of twelve ½" vent holes drilled through it, and the steel shell lid is not sealed to the steel shell body. The size of the tear was a fraction of the total area comprising the vent hole openings. Due to the tear, we estimate that the percentage of the overpack side wall which was intact was reduced from 99.97% to approximately 99.96%. As a result, we believe that the safety function of the package was not compromised during the two shipments of radioactive material made immediately prior to the August 10 inspection. At that time, there were two other USA/9215/B(U) packages in service which were qualified for use for the types of shipments at issue in this report. However, because the tear was not properly identified until after the two shipments had been made, alternate packaging was not considered.

***(4) A description of any corrective actions planned as a result of the event, including the means employed to repair any defects, and actions taken to reduce the probability of similar events occurring in the future.***

Following discovery of the tear in the sidewall, the outer metal shell of OP-8 was shipped for repair to one of our approved vendors. The damages were evaluated and repaired in accordance with provisions of our QA Program.

In addition, the issue has been discussed with all Neutron personnel involved with the shipment of radioactive material and, before any additional source shipments are made using the USA/9215/B(U) packages, further retraining will be conducted regarding maintenance and shipping procedures related to this nonconformance.

Finally, preventive action is being contemplated to actively discourage material handling personnel from pushing the outside of the steel shell with forklift forks.

***(5) Reference to any previous similar events involving the same packaging that are known to the licensee or certificate holder.***

There have been other instances when the sidewalls of the outer metal shells were damaged. The damages were evaluated and repaired in accordance with approved procedures by approved vendors. The USA/9215/B(U) package (and the USA/9102/B package of similar design which preceded it), have been used to make thousands of source shipments and, although it is often years between events like this which cause damage to the packages, similar events have certainly occurred in the past and we are considering approaches to prevent additional recurrences.

**(6) The name and telephone number of a person within the licensee's organization who is knowledgeable about the event and can provide additional information.**

Jerry L. Fogle, QA Manager for Radioactive Transportation – 304 725-7041

**(7) The extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.**

There was no exposure to radiation or radioactive materials to any individuals beyond normal handling as a result of this nonconformance.

We believe that this letter fulfills the requirements of 71.95 Reports. If you require any additional information, please contact me at 304 725-7041 or [neutron@wvinc.comcastbiz.net](mailto:neutron@wvinc.comcastbiz.net). If I am unavailable at this phone number, I can be reached through our main office at 301 349-5001.

Respectfully submitted,

Neutron Products, Inc.



William L. Ransohoff  
President

Copy via electronic mail to:

[patricia.silva@nrc.gov](mailto:patricia.silva@nrc.gov) ;  
[michele.sampson@nrc.gov](mailto:michele.sampson@nrc.gov) ; and  
[jose.cuadrado@nrc.gov](mailto:jose.cuadrado@nrc.gov)