

## CHAIRMAN Resource

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**From:** Donna Gilmore <dgilmore@cox.net>  
**Sent:** Thursday, October 30, 2014 10:40 AM  
**To:** Csonotos, Aladar; 'Jeffrey Steinmetz'  
**Cc:** Woollen, Mary; CHAIRMAN Resource; Lombard, Mark; Dunn, Darrell; Hsia, Anthony  
**Subject:** RE: Sandia transport of DCI report

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Al,  
That was such a quick look that you must not have read the second part of that same paragraph that concludes the opposite -- that the ductile cast iron is acceptable for transport. In fact, the quotes from the same document that I sent to you yesterday states the German ductile cast iron casks perform in an exemplary manner and do not have embrittlement issues. Here is the second part of the paragraph.

"However, the general conclusion of the research reported herein is that appropriate engineering design methodologies exist which, when rigorously applied to RAM transport packaging conditions and environments, warrant the use of suitable ferritic materials for packaging containment. This report summarizes the Sandia work in support of that conclusion. The report also cites and references parallel research and conclusions of other institutions. [page viii]"

It does not serve the interests of the public to share half-truths.

Respectfully,  
Donna Gilmore

----- Original message -----

From: "Csonotos, Aladar"  
Date: 10/29/2014 8:06 PM (GMT-08:00)  
To: 'Jeffrey Steinmetz' , "dgilmore@cox.net"  
Cc: "Woollen, Mary" , CHAIRMAN Resource , "Lombard, Mark" , "Dunn, Darrell" , "Hsia, Anthony"  
Subject: RE: Sandia transport of DCI report

Hi Jeffrey,

I did take a quick look at the report and here's why I said what I said. If you look at the Executive Summary:

The proposed use of ferritic materials for packaging containment has not been without controversy and critics. Ferritic materials, unlike austenitics, such as stainless steel, may exhibit a failure mode transition with decreasing temperatures and or increasing loading rates from a ductile, high-energy failure mode

to a brittle, low-energy fracture mode at below-yield stress levels. Regulators have thus been justifiably cautious regarding the use of ferritics for RAM package applications and have indicated that certification of such packages would require extensive confirmatory research and supporting data (although ferritic RAM packages for storage applications have been certified by the NRC).

I haven't been able to get in contact with the authors yet.

Thanks,

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**From:** Jeffrey Steinmetz [mailto:jeffmsteinmetz@yahoo.com]  
**Sent:** Wednesday, October 29, 2014 4:35 PM  
**To:** Csontos, Aladar; 'dgilmore@cox.net'  
**Cc:** Woollen, Mary; CHAIRMAN Resource; Lombard, Mark; Dunn, Darrell  
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Hello Al,

Thanks for your most recent reply. However, I am more interested in getting the bottom of your statement the castor/DCI cask are subject to "low temperature brittle fracture ". In your previous email sent to me just this morning you stated "I'll definitely take a look at the report", and that "I know some of the authors very well, so I can go direct to the source too." It is my hope this will get done ASAP to help insure the NRC has provided the public only facts supported by non partisan scientific research. As previously requested if the NRC is not in agreement with Sandia National Laboratories, ASTM, ASME, and the IAEA, I request and expect to see a scientific paper refuting the content in the Sandia National Laboratories paper "Fracture Mechanics Based Design for Radioactive Material Transport"

Below is a cut and past of your email sent:

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"Fracture Mechanics Based Design for Radioactive Material Transport Packagings Historical Review"

Authors

Jeffrey A. Smith - "International Nuclear Safety Department"

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I've included some key paragraphs from the Sandia report here. Maybe this will help end the myth of DCI embrittlement.

The German ductile cast iron casks perform in an exemplary manner and do not have embrittlement issues according to this Sandia National Laboratories report, Fracture Mechanics Based Design for Radioactive Material Transport Packagings Historical Review, SAND98-0764 UC-804, April 1998  
<http://www.osti.gov/scitech/biblio/654001>

"The numerous studies cited show that DI [ductile iron] is a well characterized material that does have sufficient fracture toughness to produce a containment boundary for RAM [radioactive material transport] packagings that will be safe from brittle fracture. All the drop tests discussed in this report were conducted using DI packagings and the studies indicate that even with drop tests exceeding the severity of those specified in 10CFR71 the DI packagings perform in an exemplary manner. [page 53]

The use of a fracture mechanics based design for the radioactive material transport (RAM) packagings has been the subject of extensive research for more than a decade. Sandia National Laboratories (SNL) has played an important role in the research and development of the application of this technology. Ductile iron has been internationally accepted as an exemplary material for the demonstration of a fracture mechanics based method of RAM packaging design and therefore is the subject of a large portion of the research discussed in this report. SNL's extensive research and development program, funded primarily by the U. S. Department of Energy's Office of Transportation, Energy Management & Analytical Services (EM-76) and in an auxiliary capacity, the office of Civilian Radioactive Waste Management, is summarized in this document along with a summary of the research conducted at other institutions throughout the world. In addition to the research and development work, code and standards development and regulatory positions are also discussed. [Abstract]

The proposed use of ferritic materials for packaging containment has not been without controversy and critics. Ferritic materials, unlike austenitics, such as stainless steel, may exhibit a failure mode transition with decreasing temperatures and/or increasing loading rates from a ductile, high-energy failure mode to a brittle, low-energy fracture mode at below-yield stress levels. Regulators have thus been justifiably cautious regarding the use of ferritics for RAM package applications and have indicated that certification of such packages would require extensive confirmatory research and supporting data (although ferritic RAM packages for storage applications have been certified by the NRC). However, the general conclusion of the research reported herein is that appropriate engineering design methodologies exist which, when rigorously applied to RAM transport packaging conditions and environments, warrant the use of suitable ferritic materials for packaging containment. This report summarizes the Sandia work in support of that conclusion. The report also cites and references parallel research and conclusions of other institutions. [page viii]"

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Below is a cut and past of your email sent:

\*\*\*\*\*

On Wednesday, October 29, 2014 6:09 AM, "Csontos, Aladar" <Aladar.Csontos@nrc.gov> wrote:

Hi Jeff,

Thank you for the info and thanks for taking the time to talk with me during the break.

I'll definitely take a look at the report. I know some of the authors very well, so I can go direct to the source too. The issue that I brought to your attention was low temperature brittle fracture, not ambient or elevated temperature conditions.

Thanks,  
Al

\*\*\*\*\*

Thanks again for your prompt attention to this critical issue.  
Jeff Steinmetz

On Wednesday, October 29, 2014 10:55 AM, "Csontos, Aladar" <Aladar.Csontos@nrc.gov> wrote:

Hi Jeff,

Thanks for the information.

When an application is submitted, we will review the application to ensure that the system meets our regulations. Currently, we have no application to review. The last application under review for a similar type of system was done before my time at the NRC and was terminated due to deficiencies in the application.

We did approve a Certificate of Compliance #1000 from General Nuclear Systems, Inc. for the Castor V/21 Cask Independent Spent Fuel Storage Installation. However, the certificate expired on August 17, 2010 with no one employing the certificate throughout the country.

Thanks,  
Al

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From: Jeffrey Steinmetz [[jeffmsteinmetz@yahoo.com](mailto:jeffmsteinmetz@yahoo.com)]  
Sent: Wednesday, October 29, 2014 1:15 PM  
To: Csontos, Aladar; '[dgilmore@cox.net](mailto:dgilmore@cox.net)'  
Cc: Woollen, Mary; CHAIRMAN Resource; Lombard, Mark; Dunn, Darrell  
Subject: Re: Sandia transport of DCI report

Hello Al,

Thanks for the reply. However, this Sandia paper does address your concerns of "low temperature brittle fracture". Drop test were performed at both -29C and -40C. Per the Sandia National Laboratories paper the test far exceed NRC regulations and IAEA specs.

Thanks,  
Jeff

On Wednesday, October 29, 2014 6:09 AM, "Csontos, Aladar" <[Aladar.Csontos@nrc.gov](mailto:Aladar.Csontos@nrc.gov)> wrote:

Hi Jeff,

Thank you for the info and thanks for taking the time to talk with me during the break.

I'll definitely take a look at the report. I know some of the authors very well, so I can go direct to the source too. The issue that I brought to your attention was low temperature brittle fracture, not ambient or elevated temperature conditions.

Thanks,  
Al

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From: Jeffrey Steinmetz [<mailto:jeffmsteinmetz@yahoo.com>]  
Sent: Wednesday, October 29, 2014 12:31 AM  
To: Donna Gilmore <[dgilmore@cox.net](mailto:dgilmore@cox.net)>; Csontos, Aladar  
Cc: Woollen, Mary; CHAIRMAN Resource; Lombard, Mark; Dunn, Darrell  
Subject: Re: Sandia transport of DCI report

Hello Al,

I sincerely hope you will take the time to read this Sandia paper. As a leading NRC regulator it is imperative you have all the data. Even more importantly your recommendations and public comments should be based on scientific study and not US nuclear power industry preference. The NRC and SCE continue to reconstitute disproven information from other cask suppliers. If this continues the NRC will not be able to keep the public safe from the long term onsite storage issues associated with high burn up spent nuclear fuel.

The Castor Cask use Ductile Cast Iron (DCI) and DCI is not subject to brittle issues commonly associated with cast iron. It is important that you, your staff, and your boss have all the facts concerning the use of DCI cask for radioactive material packaging. After talking with you last night and discussing your concerns about the Castor cask being brittle, it was clear you have not read all the material available covering cask constructed using DCI.

The conclusions of this study are not limited to Sandia and are also shared by ASTM, ASME, and IAEA. As result, I expect this paper and the contents to be taken seriously and if the NRC is not in agreement with Sandia National Laboratories, ASTM, ASME, and the IAEA, I request and expect to see a scientific paper refuting the content in this paper. For the well being of the public you are supposed to protect, please do not send me an email with an opinion. I am requesting a scientific paper, with all the supporting data and references.

Please use the link below and find the PDF icon in the upper right corner . The document is 4.65 MB and was refused by your email system for being too large.

"Fracture Mechanics Based Design for Radioactive Material Transport Packagings Historical Review"

Authors

Jeffrey A. Smith - "International Nuclear Safety Department"

Dick Salzbrenner, "Materials Performance, Reliability and Aging Department"

Ken Sorenson and Paul McConnel -"Transportation Development Department"

SciTech Connect: Fracture mechanics based design for radioactive material transport packagings -- Historical review<<http://www.osti.gov/scitech/biblio/654001>>

[https://ec.yimg.com/mail?url=http%3A%2F%2Fwww.osti.gov%2Fscitech%2Fbiblio-page%2F654001%2F1%2F12&t=1414539625&sig=KSEyngGoyWBtOy\\_2xFGHTQ--~B](https://ec.yimg.com/mail?url=http%3A%2F%2Fwww.osti.gov%2Fscitech%2Fbiblio-page%2F654001%2F1%2F12&t=1414539625&sig=KSEyngGoyWBtOy_2xFGHTQ--~B)<<http://www.osti.gov/scitech/biblio/654001>>

SciTech Connect: Fracture mechanics based design for  
rad... <<http://www.osti.gov/scitech/biblio/654001>>

View on [www.osti.gov](http://www.osti.gov) <<http://www.osti.gov/scitech/biblio/654001>>

Preview by Yahoo

Thank you,

Jeff Steinmetz

On Monday, October 27, 2014 8:24 PM, Donna Gilmore <[dgilmore@cox.net](mailto:dgilmore@cox.net)> wrote:

Al,  
Jeff mentioned you haven't seen this report regarding transport of ductile cast iron. It refutes the concerns regarding embrittlement.

Donna Gilmore  
[SanOnofreSafety.org](http://SanOnofreSafety.org)  
949-204-7794