

Allen, William

From: Sarah Bryson <sarah.bryson@croftltd.com>
Sent: Tuesday, December 17, 2013 11:39 AM
To: Allen, William
Cc: Piotter, Jason; Ian Dingwall
Subject: RE: Testing Update

Chris,

We have limited data for the Ti alloy just the yield, tensile and elongation measured from our test sample, I have included data for 2% Mo alloy to compare, these figures are taken from the Battelle report I have previously referenced, all results are at room temperature:

Tensile test results	Ti alloy (prototype testing)	Mo alloy (manufactured packages)
Yield Stress (ksi)	62.5	67.1
Tensile Stress (ksi)	106	132
Elongation (%)	4	9.7

Sarah

Sarah Bryson

Licensing Engineer

Direct Tel: +44(0)1865 408641

Croft Associates Limited

Building F4, Culham Science Centre, Culham
Abingdon, Oxfordshire, OX14 3DB

Telephone: +44(0)1865 407740 Fax: +44(0)1865 407449

Email: sarah.bryson@croftltd.com Website: www.croftltd.com

From: Allen, William [mailto:William.Allen@nrc.gov]
Sent: 17 December 2013 15:12
To: Sarah Bryson
Cc: Piotter, Jason
Subject: FW: Testing Update

Would you be able to provide a stress strain curve for the depleted uranium used in both the drop tests and the Charpy test?

From: Piotter, Jason
Sent: Monday, December 16, 2013 2:16 PM
To: Allen, William
Cc: Call, Michel; Tarantino, David; Piotter, Jason
Subject: Re: Testing Update

I would like to see a stress strain curve for both materials. That puts this to rest for me.

JP

Sent via My Workspace for iOS

On Monday, December 16, 2013 at 2:11:12 PM, "Allen, William" <William.Allen@nrc.gov> wrote:

EVERYBODY, PLEASE let me know ASAP how the information below impacts your SER evaluations if it impacts your evaluations at all. Thanks, Chris

From: Sarah Bryson [<mailto:sarah.bryson@croftltd.com>]

Sent: Friday, December 13, 2013 3:39 AM

To: Allen, William

Cc: Bob Vaughan

Subject: Testing Update

Hello Chris

With regard to Question 1, yes silicone O-rings will be used for the vibration test.

With regard to question 2, no, the depleted Uranium used to fabricate the package is not the same alloy as the DU used to validate the package design.

For fabrication, Croft's original intent was to use 2% Mo DU alloy because we believe that is the industry standard for shielding in transportation packages. Specifically, 2% Mo DU alloy manufactured by MSC was used in the MIDUS packages approved by the NRC. Croft asked both Aerojet and MSC, the only two commercial manufacturers of DU identified in the US, to quote for manufacturing the prototype DU in 2008. Aerojet quoted the prototype manufacture using their DU alloy, which is ¾ Ti, while MSC quoted manufacture using 2% Mo.

Because the 2 alloys of DU have similar properties and because the physical testing demonstrated the suitability of the containment boundary and the efficacy of the structural steel and cork to protect the shielding from any damage, we felt both DU alloys were equally suitable and chose the vendor with the lower price, Aerojet, for prototyping. When the project reached the production phase, again MSC and Aerojet were asked to quote for production quantities. On this occasion MSC was chosen, despite being the more expensive option, in large part because they were using the 2% Mo material previously approved by NRC.

Thank you
Sarah

Sarah Bryson

Licensing Engineer

Direct Tel: +44(0)1865 408641

Croft Associates Limited

Building F4, Culham Science Centre, Culham
Abingdon, Oxfordshire, OX14 3DB

Telephone: +44(0)1865 407740 Fax: +44(0)1865 407449

Email: sarah.bryson@croftltd.com Website: www.croftltd.com

From: Allen, William [<mailto:William.Allen@nrc.gov>]

Sent: 09 December 2013 14:53

To: Sarah Bryson

Subject: RE: Testing Update

Two quick questions for you.

For performance of the vibration test on the 11th, will silicone o-rings be installed in the shielding insert?

Will the depleted uranium used to fabricate the packaging be identical to that used in the drop tests to validate the package design?

Thanks, Chris

From: Sarah Bryson [<mailto:sarah.bryson@croftltd.com>]
Sent: Thursday, December 05, 2013 3:27 AM
To: Allen, William
Cc: Ian Dingwall
Subject: RE: Testing Update

Hi Chris,

We are scheduled to carry out the vibration test next Wednesday, 11th December. On a different topic do you think there is a possibility that the DU and O-ring specifications could be changed? We are currently manufacturing and can't move forward until we have some indication that they will be acceptable.

Thank you,
Sarah

Sarah Bryson
Licensing Engineer
Direct Tel: +44(0)1865 408641

Croft Associates Limited
Building F4, Culham Science Centre, Culham
Abingdon, Oxfordshire, OX14 3DB

Telephone: +44(0)1865 407740 Fax: +44(0)1865 407449
Email: sarah.bryson@croftltd.com Website: www.croftltd.com

From: Allen, William [<mailto:William.Allen@nrc.gov>]
Sent: 02 December 2013 22:30
To: Sarah Bryson
Subject: Testing Update

Anything new to report on the vibration test?

Croft Associates Ltd
Building F4 Culham Science Centre
Culham, Abingdon. Oxfordshire OX14 3DB.
Tel: 01865 407740 Fax: 01865 407449
Company No 1698337.

The information contained in this email may be commercially sensitive and/or legally privileged. It is intended solely for the person(s) to whom it is addressed. If you are not a named recipient, you are on notice of its status. Please notify the sender immediately by reply e-mail and then delete this message from your system. You must not disclose it to any other person, copy or distribute it or use it for any purpose.

This email and attachments have been scanned for viruses on dispatch, however, Croft Associates cannot guarantee that the e-mail or any attachments are completely free from viruses.

Croft Associates Ltd
Building F4 Culham Science Centre
Culham, Abingdon. Oxfordshire OX14 3DB.
Tel: 01865 407740 Fax: 01865 407449
Company No 1698337.

The information contained in this email may be commercially sensitive and/or legally privileged. It is intended solely for the person(s) to whom it is addressed. If you are not a named recipient, you are on notice of its status. Please notify the sender immediately by reply e-mail and then delete this message from your system. You must not disclose it to any other person, copy or distribute it or use it for any purpose.

This email and attachments have been scanned for viruses on dispatch, however, Croft Associates cannot guarantee that the e-mail or any attachments are completely free from viruses.