

Level 1

Shipping and storage incident

D Keller

Contractor who advised

Gene Sanders

Manager, W.E. Train Consulting

Gene@WEtrainConsulting.com

8635 W. Hillsborough Ave. #112

Tampa, FL 33615 USA

www.WEtrainConsulting.com

alternate [e-mail: WEtrain@att.net](mailto:WEtrain@att.net)

mobile phone: +1 (813) 855-3855

personal cell: +1 (412) 779-5151

Drum

DOT Conformity

Drum must be marked with: This package conforms to 49CFR 173.4 for domestic highway or rail transport only. UN1977 Nitrogen, refrigerated liquid

The "UN1977" must be at least 1/2 inch (12 mm) tall.

Shipping out



Keller, D (dmk9m)

To: Richard Tesarek

Cc: Raymond H Lewis <rhlewis@fnal.gov> **+1 other**



Wed 1/25/2023 7:39 PM

Yesterday Rick T and I filled out an MMR requested by Jim. I do not know the details of the transfer process from MAB to shipping as that was part of the MAB, but we listed it as a hazardous material transport with both NH3 and LN2. After it arrived at shipping I visited Jim to check that all was well and ready to go. At that time I called Rick T and reported the status which was that Jim found that the amount of ammonia kept in the dewar was in fact a small enough amount to be listed as non-hazardous within the **DOT** guidelines and would be sent first thing this morning (Wednesday). I asked Jim to take a photo before it left. It is now inbound for UVA.

Shipping NH3 to FNAL



Keller, D (dmk9m)



To: James L Cyko <jcyko@fnal.gov>; Katie Swanson <kswanson@fnal.gov>; Lisa M. Reger <reger@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>

Thu 1/12/2023 10:24 PM

Cc: Gene Sanders of W.E.Train Consulting <Gene@wetrainconsulting.com>; Richard Tesarek

In regards to the actual shipping procedure, we did do our very best to follow the **DOT** code. I asked a lot of questions and I ask for help to do this but in the end, there was not much guidance. I reached out to many carriers of hazardous materials but could not find any options that dealt with both LN2 and NH3. Using a high-temperature dry dewar is not an option. We ultimately find some help and worked with someone who had the appropriate qualification to assist and train with all the required steps of this procedure. His name is Gene Sanders and he is CCed here. Please correspond with him directly with any questions or concerns about the steps, packing, training, driver, etc.

It is true we don't need to get any more NH3 here this month. But because of the demands of the experiments coming up and the complexity of this, I hope we can continue to work on this until we can find a functional pipeline that everyone is OK with. I will take whatever steps are needed. I just need to know what they are.

Amount of NH₃ in the actual dewar

This was intended to be a test for shipping/receiving at FNAL

- So there were 3 bottles shipped (each bottle can hold no more than 10g)
 - However only 1 bottle had NH₃
 - The other two had negligible amounts
 - This was done to ensure that we were far below the Hazardous limit

From: Keller, D (dmk9m) <dustin@virginia.edu>

Sent: Thursday, January 5, 2023 9:45 AM

To: Katie Swanson <kswanson@fnal.gov>; Lisa M. Reger <reger@fnal.gov>

Cc: Richard J Tesarek <tesarek@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>

Subject: Re: Bringing target material onsite

Hi Katie,

Do you have a preferred **DOT**-certified transport service?

Recall what is being transported is a liquid nitrogen dewar with frozen solid-state material inside.

How do we officially receive the material at NM4 from this transport?

thanks

dustin

From: Katie Swanson <kswanson@fnal.gov>

Sent: Thursday, January 5, 2023 2:25 PM

To: Keller, D (dmk9m) <dustin@virginia.edu>; Lisa M. Reger <reger@fnal.gov>

Cc: Richard Tesarek <tesarek@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>; James L Cyko <jcyko@fnal.gov>

Subject: RE: Bringing target material onsite

Dustin,

Lisa spoke with Jim Cyko from our shipping/ receiving department this morning.

It is the responsibility of UVA to appropriately ship this material. A google search on UVA's website lands here [Shipping Hazardous Materials \(Dangerous Goods\), UVA \(virginia.edu\)](https://www.virginia.edu/shipping-hazardous-materials-dangerous-goods). You should speak to the appropriate ES&H contact on this webpage. It specifically states "All shipments of chemical or radiological materials MUST be shipped by EHS personnel". Additionally, Jim has requested that you provide us with the UN number that the material will be shipped as and an anticipated ship date prior to shipment.

Thank you,

Katie

On Jan 5, 2023, at 14:40, Keller, D (dmk9m) <dustin@virginia.edu> wrote:

Are you saying you do not have a **DOT** transport service you work with or recommend?

UVA does not transport cryogenics.

Also, much of the future material will be coming directly from NIST and not UVA, how would you suggest we address this?

thanks
dustin

Hi Dustin,

I might suggest you work directly with Jim Cyko (cc'd here). He has assisted with the transport of hazardous materials for several years and can help you at least with the transportation part.

Rick

On Jan 5, 2023, at 14:40, Keller, D (dmk9m) <dustin@virginia.edu> wrote:

Are you saying you do not have a DOT transport service you work with or recommend?

UVA does not transport cryogenics.

Also, much of the future material will be coming directly from NIST and not UVA, how would you suggest we address this?

thanks
dustin

To All Parties,

Fermilab will not ship or is allowed to ship any hazardous material from another facility. There are numerous certifications and government regulations that govern the shipment of hazardous material.



Keller, D (dmk9m)



To: Katie Swanson <kswanson@fnal.gov>; Lisa M. Reger <reger@fnal.gov>

Thu 1/5/2023 3:58 PM

Cc: Richard Tesarek; Raymond H Lewis <rhlewis@fnal.gov> **+1 other**

To clarify a bit,

What we want to bring now is just a sample. On the order of 10 grams. We will need a piping line to move a lot of this material onsite, and store it in the very near future. On the order 1 kg. It would be good for us to try to work out these plans and details now and understand the piping line given the requirements of ES&H and the needs of the experiment.

Most of this material will move directly from NIST to FNAL. It may also move from a Lab closer to Chicago to FNAL if we can work that out.

The transportation vessel is a liquid nitrogen dewar. Inside the vessel are samples. The dewar can hold from 5g to 200g.

What I'm getting so far is that it wasn't clear before that this is a cryogenic and frozen solid material. Does this change anything on the FNAL side?

thanks
dustin

From: Keller, D (dmk9m) <dustin@virginia.edu>

Sent: Wednesday, January 4, 2023 10:02 AM

To: Raymond H Lewis <rhlewis@fnal.gov>; Katie Swanson <kswanson@fnal.gov>

Cc: Richard J Tesarek <tesarek@fnal.gov>

Subject: Bringing target material onsite

Hello,

I intend to bring frozen NH₃ (~12 g) onsite to FNAL this Friday (Jan 6th). This will be the primary target material for SpinQuest (E1039) which we hope will begin running very soon. We do not intend to handle it until after our formal target material review and ORC but we really need to have it onsite. We have a designated area in NM4 that is well ventilated and the dewar that it will be stored in is a 30-day LN₂ dewar (meaning once filled it last 30 days before needed refilling). We will refill the dewar every week on the same day once it holds the material.

Please let me know if there is any issue with this plan.

Thank You

Dustin Keller, E1039 SP.