

Subject: SeaQuest ORC

From: Leo Bellantoni <bellanto@fnal.gov>

Date: 11/4/16, 09:42

To: Patricia McBride <mcbride@fnal.gov>, Robert S Tschirhart <tsch@fnal.gov>, Sergei Nagaitsev <nsergei@fnal.gov>, Paul C Czarapata <pceed@fnal.gov>, Daniel A Johnson <d_johnson@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Raymond H Lewis <rhlewis@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, "Paul E Reimer" <reimer@anl.gov>, David C Christian <dcc@fnal.gov>, James R Kilmer <kilmer@fnal.gov>

CC: Kathy J Graden <graden@fnal.gov>, Steve J Chappa <chappa@fnal.gov>, Madelyn Wolter <maddiew@fnal.gov>, David Mertz <mertz@fnal.gov>, "James L. Priest" <priest@fnal.gov>, Teri L Dykhuis <dykhuis@fnal.gov>, Robert J Bushek <bushek@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Russell A Rucinski <rucinski@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Bridget K Scerini <iverson@fnal.gov>, "Kenneth S. Premo" <premo@fnal.gov>, Raymond H Lewis <rhlewis@fnal.gov>, John Scott <john.scott@science.doe.gov>, "Carol J Johnstone" <cjj@fnal.gov>

Dear ORC signatories for SeaQuest and others,

E906 (SeaQuest) has had, in the experimental hall NM4, installed no upgrades during this shutdown. My committee did do a walk-through on 21 Oct 2016, and while we did identify some issues, they were all minor and have been remedied. PPD_ESH_006 provides that the ORC can be renewed in this circumstance, upon signatories to the original ORC being so notified; so, I notify you.

There was work done in the target area, NM3. That area is I believe AD responsibility, and the safety review there is outside my committee. Rather it is the responsibility of Jim Kilmer. Jim tells me that with the LOTO units in place as pictured below, he is ok for a partial ORC; there is more work that needs to be done later that will also require review. But that is a separate issue, outside my jurisdiction; far as I am concerned, the ORC is extended.

Yours truly,

Leo Bellantoni
Senior Scientist

Fermi National Accelerator Laboratory
630 730 2155
bellanto@fnal.gov

Begin forwarded message:

From: James R Kilmer <kilmer@fnal.gov>

Subject: RE: ORC and Targets

Date: November 4, 2016 at 7:17:37 AM CDT

To: Leo Bellantoni <bellanto@fnal.gov>

Yes this is fine. I would agree with this partial ORC.

From: Leo Bellantoni
Sent: Thursday, November 03, 2016 7:59 PM
To: James R Kilmer <kilmer@fnal.gov>
Subject: Fwd: ORC and Targets

You good with this all? I just wanna check with you -

Yours truly,

Leo Bellantoni
Senior Scientist

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bellanto@fnal.gov

Begin forwarded message:

From: Gary L Lauten <glauten@fnal.gov>
Subject: RE: ORC and Targets
Date: November 3, 2016 at 4:46:15 PM CDT
To: Paul E Reimer <reimer@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>, Raymond H Lewis <rhlewis@fnal.gov>
Cc: James R Kilmer <kilmer@fnal.gov>, David C Christian <dcc@fnal.gov>, Madelyn Wolter <maddiew@fnal.gov>, Joel M Fulgham <fulgham@fnal.gov>, Thomas R Kobilarcik <kobilarc@fnal.gov>, "Adam C. Watts" <awatts@fnal.gov>, "Craig D. Moore" <cmoore@fnal.gov>

The H2 and D2 supply cylinders are locked off with my RSO locks. See attached photos. NM3 Target can take beam as described by Paul Reimer below. This constitutes a partial ORC for beam to the targets and empty flasks as described by Paul Reimer below, with no H2 and D2.

My RSO locks will not be removed from these cylinders until a full ORC is approved.

I recommend approval for this partial ORC.

Gary Lauten

Gary Lauten, MSNE, CHP
AD Operational RSO

ESH&Q Radiation Safety
Fermi National Accelerator Laboratory
P.O. Box 500, MS 371
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USA

630 840-8360 office
630 722-3175 pager
www.fnal.gov
glauten@fnal.gov

From: Gary L Lauten
Sent: Wednesday, November 02, 2016 3:03 PM
To: 'Reimer, Paul E.' <reimer@anl.gov>; Leo Bellantoni <bellanto@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>
Cc: James R Kilmer <kilmer@fnal.gov>; David C Christian <dcc@fnal.gov>; Madelyn Wolter <maddiew@fnal.gov>; Joel M Fulgham <fulgham@fnal.gov>; Thomas R Kobilarcik <kobilarc@fnal.gov>; Adam C. Watts <awatts@fnal.gov>; Craig D. Moore <cmoore@fnal.gov>
Subject: RE: ORC and Targets

Paul,

Thank you for your clarification. I also found in the shielding assessment a thermal analysis of the absorber steel at your full intensity operating limit is not an issue. The heating of the steel is < 560 C, and the melting point of steel is 1400-1450 C. So it doesn't matter if there is an empty flask or not.

I would like to have a physical lock on your valves for the H2 and D2 lines, since we have to be careful with our ORC process. This way we ensure that there is no inadvertent running of the H2 and D2 targets before we have an official approved ORC.

I will be out on Thursday to place a couple of clamshell lockouts on these valves.

Thanks again,

Gary

From: Reimer, Paul E. [<mailto:reimer@anl.gov>]
Sent: Wednesday, November 02, 2016 2:15 PM
To: Gary L Lauten <glauten@fnal.gov>; Leo Bellantoni <bellanto@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>
Cc: James R Kilmer <kilmer@fnal.gov>; David C Christian <dcc@fnal.gov>; Madelyn Wolter <maddiew@fnal.gov>; Joel M Fulgham <fulgham@fnal.gov>
Subject: RE: ORC and Targets

Hi Gary,

I think that there may be a slight misunderstanding of SeaQuest's normal operating procedures. We have always had 8 target positions in our target rotation. Those positions are:

1. IH2
2. Empty Flask
3. ID2
4. No Target (straight to dump)
5. C
6. Fe
7. W

What we would like to run until we get the parts for the liquid targets is

1. Empty Flask (that will eventually hold IH2)
2. Empty Flask
3. Empty Flask (that will eventually hold ID2)
4. No Target (straight to dump)
5. C
6. Fe
7. W

So basically, we are requesting that we can run three empty flasks rather than one. It is likely that to maximize the useful data, we will not take much data on any of the 3 empty flasks and concentrate on targets 4-7.

We are happy to tag out or lock out (if you can provide something over one of the supply valves) our H2 and D2 gas lines. I don't feel that a lock is necessary because

1. What we are waiting for before requesting approval is a valve that keeps the H2 and D2 from venting in the target cave. Thus if we did open the valves, we would immediately set off the flammable gas detectors have receive a immediate visit from many fire trucks. You will know when these valves are replaced, as it is in the target cave and we need rad tech coverage to do it.
2. Of the large number of valves that could do that, for both IH2 and ID2, the valves that I would tag/lock out are in closed in interlocked in NM4 and inaccessible due to the interlock.

But, as I said, I would be happy to tag/lock out the valves additionally if you would like.

Paul

From: Gary L Lauten [glauten@fnal.gov]
Sent: Wednesday, November 02, 2016 1:09 PM
To: Leo Bellantoni; Raymond H Lewis
Cc: James R Kilmer; Reimer, Paul E.; David C Christian; Madelyn Wolter; Joel M Fulgham
Subject: RE: ORC and Targets

All,

We will need to lock out the supply valves for the gas targets until that part of the system is approved. Administratively, the experts will need to show that they can set their target controls to only allow solid targets in the beam. At this time, it is my thought that we cannot run beam right into the absorber with no target interaction, even though the interaction length of a gas filled target is insignificant. However, if you think you have run beam into a blank target in the past for subtracting background, we should discuss this.

For now I think we are only running to the solid targets. I will write an Operating Note for the MCR explaining this, and we will need a partial ORC approval for running beam to the non-gas targets. The ORC should also explain how we're not going to insert the gas target.

Gary

From: Leo Bellantoni
Sent: Wednesday, November 02, 2016 12:01 PM
To: Gary L Lauten <glauten@fnal.gov>; Raymond H Lewis <rhlewis@fnal.gov>

Cc: James R Kilmer <kilmer@fnal.gov>; Paul E Reimer <reimer@anl.gov>; David C Christian <dcc@fnal.gov>

Subject: Fwd: ORC and Targets

Dear Gary, Dear Ray,

The status on SeaQuest is that (1) I am happy about NM4; (2) it sounds like they are not going to have the H₂/D₂ apparatus set up before beam arises. This means that they will want to run onto empty targets. By itself of course it is hard to imagine this is an issue; they have had a 3rd, empty, target in there and running with an empty is a well known technique for subtracting background. I think they have run with the empty earlier, but I don't know for certain, or if perhaps there might be some change in beam intensity, so I cc: them.

However, there is the issue of somebody mistakenly opens the valves on the bottles and gas flows into a not-ready system. From a conversation I had with Jim just now, he didn't seem super concerned to me. He did say that there are holes in the bottles where relief valves are to be installed so that might mean H₂ flows into the enclosure? I don't really know, nor do I know about how securely the valves are locked up now.

And, y'know, I shouldn't, right? It's NM3, not my job! But anyway I just observe that some decision has to be made and probably be better to do it today or maybe tomorrow.

Yours truly,

Leo Bellantoni
Senior Scientist

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bellanto@fnal.gov

Begin forwarded message:

From: Paul E Reimer <reimer@anl.gov>
Subject: ORC and Targets
Date: November 1, 2016 at 7:13:03 PM CDT
To: Leo Bellantoni <bellanto@fnal.gov>, "James L. Priest" <priest@fnal.gov>, "Adam C. Watts" <awatts@fnal.gov>
Reply-To: <reimer@anl.gov>

Hello Leo and Jim,

We are still working on correcting and configuring things. It appears that beam may be delivered on Friday.

One issue has come up in the exact wording of the ORC with respect to the cryogenic targets not being ready. People in AD are concerned about the wording. Specifically, we would like to be able to put beam on all of our target positions, including the cryo positions. Otherwise, AD will require a lock out on the target table motion to prohibit us from putting beam on the empty cryo flasks. We will not, however, be ready to put H₂ or D₂ into the cryo target positions. The safety problem is not with beam on the flasks, but with H₂ and D₂ in the flasks.

Jim, I believe that we are trust worthy to not introduce H₂ and D₂ into the flasks without your permission, but if you or AD would like to lock out or tag out the fill

valves, that is fine with me (although, I don't have a device that would cover a valve--I presume that they exist).

Leo, I'll send you an e-mail tomorrow with a progress update. Would you like to come over on Thursday for a final check?

Paul

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