

Operational Readiness Clearance

SeaQuest E906

5 Mar 2012

AUTHORIZATION TO PROCEED WITH THE REMOTE OPERATION OF E906 (SeaQuest)
FOR COMMISSIONING UNTIL 4 JULY 2012

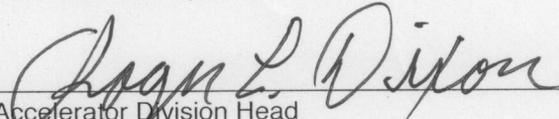
REVIEWED AND APPROVED BY:

DATE



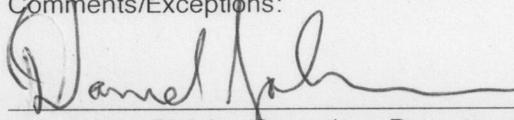
Particle Physics Division Head
Comments/Exceptions:

3/6/2012



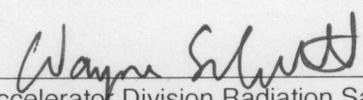
Accelerator Division Head
Comments/Exceptions:

3-6-12



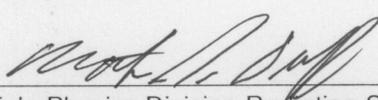
Accelerator Division Operations Department Head
Comments/Exceptions:

3/6/12



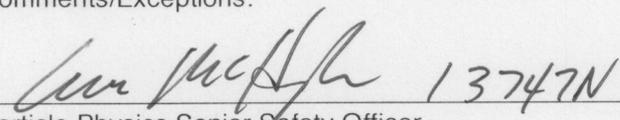
Accelerator Division Radiation Safety Officer
Comments/Exceptions:

3/6/12



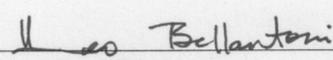
Particle Physics Division Radiation Safety Officer
Comments/Exceptions:

3/6/12



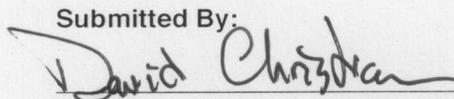
Particle Physics Senior Safety Officer
Comments/Exceptions:

6 Mar 2012



Committee Chair
Comments/Exceptions: No energization of KMag or FMag until OK by W. Jaskierny

5 Mar 2012

Submitted By:


Requester P. Reimer (ANL) D. Christian (FNAL)

3/5/12

A signed paper form (copy) of this document will exist in the Particle Physics Division Office. The original signed document will stay with the experiment requesting clearance.

From: Angela M Sands <asands@fnal.gov>
Subject: Sea-Quest ORC
Date: March 1, 2012 2:41:12 PM CST
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: Teri L Dykhuis <dykhuis@fnal.gov>

Hello Leo,

Following our walk-through at Sea-Quest today, Teri and I request that a monthly gas usage report be sent to me. We did not observe any environmental issues that would prohibit our recommendation for ORC.

Thank you,
Angela

Angela Sands
Particle Physics Division - ES&H
(630)840-3701, MS 355

From: Steve Chappa <chappa@fnal.gov>
Subject: RE: SeaQuest Final Approval
Date: March 1, 2012 3:55:12 PM CST
To: 'Leo Bellantoni' <bellanto@fnal.gov>
Cc: 'Eric D McHugh' <emchugh@fnal.gov>, 'Robert J Bushek' <bushek@fnal.gov>, 'Karen M Kephart' <karenk@fnal.gov>, 'Teri L Dykhuis' <dykhuis@fnal.gov>, 'Walter F Jaskierny' <waltj@fnal.gov>, 'James L. Priest' <priest@fnal.gov>, 'Russell A Rucinski' <rucinski@fnal.gov>, 'Paul E Reimer' <reimer@anl.gov>, 'Charles N Brown' <chuckb@fnal.gov>, 'David C Christian' <dcc@fnal.gov>, 'Andy Stefanik' <stefanik@fnal.gov>, 'David R. Pushka' <pushka@fnal.gov>, 'James R Kilmer' <kilmer@fnal.gov>, 'Gary L Lauten' <glauten@fnal.gov>, 'Joseph W Howell' <howell@fnal.gov>, 'Robert J Woods' <rjwoods@fnal.gov>, 'Tug T Arkan' <arkan@fnal.gov>, 'Kathy J Graden' <graden@fnal.gov>

Hi Dr. Leo,

After conducting a final walk-through of the SeaQuest installation in the collision hall, I did not see any other concerns that would warrant corrective action. Therefore, I reiterate my recommendation for the issuance of the ORC.

However, in the control room, I did a walk-around and there were two or three instances of daisy-chained power strips or power strips connected using extension cords. These instances need to be corrected. There are enough outlets on the overhead raceway so daisy-chaining power strips is not necessary.

Second, in the control room, there is a UPS unit powering computer or control equipment that needs to be labeled. Eric has these labels and they should be prominently displayed so it can be clearly seen as you approach the rack with the UPS unit.

Regards,
Steve Chappa

From: Leo Bellantoni [mailto:bellanto@fnal.gov]
Sent: Thursday, March 01, 2012 9:00 AM
To: Eric D McHugh; Robert J Bushek; Karen M Kephart; Teri L Dykhuis; Walter F Jaskierny; James L. Priest; Russell A Rucinski; Steve J Chappa; Paul E Reimer; Charles N

From: Steve Chappa <chappa@fnal.gov>
Subject: RE: The UPS
Date: March 5, 2012 9:41:31 AM CST
To: 'Leo Bellantoni' <bellanto@fnal.gov>
Cc: <reimer@anl.gov>, 'Walter F Jaskierny' <waltj@fnal.gov>, 'Eric D McHugh' <emchugh@fnal.gov>, 'David C Christian' <dcc@fnal.gov>

Hi Dr. Leo,

The UPS now has the sticker on it. Paul put it there while we were there.

Second, the rack in question (E906) has been checked during one of the previous walk-throughs. I just did not recognize the rack from your picture since the picture was upside-down and I did not realize the picture was upside-down (chuckles had by all). So, there are no upside-down racks and I think we are good to go.

While looking at the UPS, we took a closer look at the auto-transformers next to it and Walter noticed that the wires attached to it were on a NEMA15-P plug and these plugs should be not used as connected to the signal cable wire. Thus, since these transformers are not part of the installation and are currently not being used, we removed the plugs from the signal cable and removed the transformers from the rack.

Now I can say I am satisfied with the installation.

Regards,
Steve

From: bellanto [mailto:leobellantoni@me.com]
Sent: Sunday, March 04, 2012 2:49 PM
To: Steve Chappa
Subject: The UPS

Hi Steve, please to remember to check that they labeled the UPS tomorrow -

From: Karen M Kephart <karenk@fnal.gov>
Subject: FW: SeaQuest Final Approval
Date: March 2, 2012 6:35:32 AM CST
To: Leo Bellantoni <bellanto@fnal.gov>

Leo:

I concur with Jim's assessment below, and want to add that if/when flammable is needed any Tygon tubing should be replaced at the least with Polyflo or a like non-permeable material.

I also recommend the issuance of the ORC.

K.

Karen M Kephart
Fermi National Accelerator Laboratory
Particle Physics Division
Assistant Head for Technical Support
630-840-6625
630-485-0587
karenk@fnal.gov

From: James L. Priest
Sent: Thursday, March 01, 2012 8:43 PM
To: Karen M Kephart
Subject: Re: SeaQuest Final Approval

Leo, Karen Kephart and I conducted the final walk-through of the SeaQuest installation in the KetV (SeaQuest) collision hall from a fire safety and safety view point. I did not see any issues that require corrective action for running with non-flammable gas. When and if flammable gas is found necessary SeaQuest will require another review which will include the gas shed and the installation of flammable gas detectors and submittal of leak data for the detector.

Therefore, I reiterate my recommendation for the issuance of the ORC and I am forwarding by recommendation to Karen to add her comments and she will forward to you.

Regards

Priest

Dr. James Priest PhD / MS119
Senior Fire Strategist / Researcher
ES&H Section
Fermi National Accelerator Lab
Office of Science/U.S. Department of Energy
Managed by Fermi Research Alliance
PO Box 500
Batavia IL 60510
Tel. 630-840-4283
Cell. 312-636-6259
Fax. 630-840-3390

On Mar 1, 2012, at 10:59 AM, Leo Bellantoni wrote:

We probably have to drop the interlocks.

I do not believe that all the persons involved are up-to-date on their controlled access training.

Better than 20 to 1 odds they aren't.

May as well MCR now, they will appreciate the heads-up.

Leo

Dr. Leo Bellantoni
(630)730-2155
MS 357, Fermilab Batavia, IL 60510

From: David Christian <dcc@fnal.gov>
Subject: **Re: Sea-Quest ORC**
Date: March 1, 2012 4:27:20 PM CST
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: Teri L Dykhuis <dykhuis@fnal.gov>, Paul Plucinsky <plucinsk@head-cfa.harvard.edu>, Angela M Sands <asands@fnal.gov>, David C Christian <dcc@fnal.gov>

Hi Leo,

We will use methane; our gas is a mixture of Argon, Methane, and CF4. We start with premixed bottles of 92% Argon, 8% Methane (agreed non flammable) and mix with CF4 (also non flammable).

At some point I would like to do tests using an Argon, Isobutane, Methylal mix, but not now.

- Dave

On 3/1/2012 4:01 PM, Leo Bellantoni wrote:

I believe this is still accurate. It calls out methane, which is not planned by the experimenters. I do not see discussion of isobutane and methylal in the NEPA. These are being discussed by, but not requested by, the experimenters. I'm sure they will try to get by without them!

Leo

Dr. Leo Bellantoni
(630)730-2155
MS 357, Fermilab Batavia, IL 60510

On Mar 1, 2012, at 3:32 PM, Teri L Dykhuis wrote:

Hi Leo,
Please review project NEPA documentation attached and if it's still accurate then we're good to go.

From: Andy Stefanik <stefanik@fnal.gov>

Subject: RE: SeaQuest Final Approval

Date: March 1, 2012 6:26:19 PM CST

To: Leo Bellantoni <bellanto@fnal.gov>, Paul E Reimer <reimer@anl.gov>, David C Christian <dcc@fnal.gov>, Joseph W Howell <howell@fnal.gov>

Leo,

Just finished reviewing the EN. I will write a summary report and send it to you tomorrow. I want to tell you that I accept this frame in the two currently installed positions. However, work remains to be done. As discussed at the last walk-thru I attended, we want a permanent warning sign attached at both hanger friction connections on the detectors with vertical tubes as a pre-requisite to taking beam. The warning sign must state that the connection is a friction connection and the bolts must not be loosened when the detectors are hanging.

Calculations in the EN need to be finished correctly. Hopefully, this will happen even though I'm saying the detector frames are ok hanging as they are now. I'm concerned that once the experiment receives the ok to take beam they will quit working on the EN.

Also, Paul knows he has some work to do based on the calculations they added for us. The calcs revealed weak connections where the lifting frame bolts to the detector frame when the frame is rotated between horizontal and vertical as described in the EN. One fix for this is to design a way to install the swivel hoist rings for this operation directly to the detector frame rather than to the lifting frame.

Must I attend a walk-thru tomorrow?

Andy

From: Andy Stefanik <stefanik@fnal.gov>
Subject: RE: SeaQuest Final Approval
Date: March 2, 2012 11:36:11 AM CST
To: Paul E Reimer <reimer@anl.gov>, Leo Bellantoni <bellanto@fnal.gov>
▶ 2 Attachments, 364 KB

Paul,

To confirm our conversation:

I've attached a very nice image from the EN and a photo that shows the friction joint. The 4 lower black bolts are bolted into the 8020 rail. If these 4 lower bolts are loosened or overloaded the frame will want to slide downwards and load will transfer to the upper 4 gray bolts. The upper 4 bolts bolt into the ends of the 8020 rail and we don't want the load shifting to those bolts, unless you revise the EN and show it is ok.

Andy

-----Original Message-----

From: Paul E. Reimer [mailto:reimer@anl.gov]
Sent: Thursday, March 01, 2012 10:06 PM
To: Andy Stefanik; Leo Bellantoni
Subject: Re: SeaQuest Final Approval

Hi Andy,

Thanks a lot for the rush work on this. Getting the note from my collaborators has been difficult for me as well. I'll try to get the revisions made to the note (possibly by passing the Los Alamos people).

I'm not completely clear on which connections you are calling the "hanger friction connections" Can I stop by tomorrow morning with a drawing so that you can point it out to me--I want to make sure that the correct thing is labeled.

Paul

On 3/1/12 6:26 PM, Andy Stefanik wrote:

Leo,

Just finished reviewing the EN. I will write a summary report and send it to you

From: Kurt J Krempetz <krempetz@fnal.gov>
Subject: RE: Steel in SeaQuest
Date: March 5, 2012 11:20:12 AM CST
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: David C Christian <dcc@fnal.gov>, Paul E Reimer <reimer@anl.gov>

Hi Leo,

I've reviewed the information Paul has sent. Typically we consider a structures which can withstand .1g force in any direction as an acceptable criteria. Paul used .15g's in his calculations and showed the wall was stable. This .1g number is derived from an older version of ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures.

I hope this helps, if you have any other questions please let me know.

Cheers,

Kurt

-----Original Message-----

From: Paul E. Reimer [mailto:reimer@anl.gov]
Sent: Monday, March 05, 2012 8:58 AM
To: Leo Bellantoni
Cc: Kurt J Krempetz; David C Christian
Subject: Re: Steel in SeaQuest

Hello Kurt,

Over the weekend, I had a few of my people think about this. Below is there response.

Paul

Hi Guys!

OK, here's what I came up with for stability of the iron wall under seismic loading. I attached a PDF. See what you think...

Looking at the force vector from the Iron Wall Center of Gravity the line of force is within the Iron Wall...so it should be stable...

Kevin

Good Afternoon Kevin and Paul,

I agree with your analysis Kevin. It should be stable under such a load but I have two comments:

I think your method implies a solid wall instead of the individual iron blocks. However, the individual blocks are of such a geometry that individual seismic loads will produce the same line of force. This line is within the blocks too so there is no chance of tipping over. They would slide before they tipped which brings me to my second comment.

These blocks are not secured to the floor or to each other so someone might wonder if the seismic load could result in slipping between blocks or between the blocks and the concrete floor. The assumed load is 15% of the weight so if the coefficient of friction is less than 0.15 (either between iron/iron or iron/concrete) then slippage may occur. I did some casual searching and found an iron/iron coefficient 1.0 so that's not a problem. I couldn't find anything for iron/cement but I bet it's high enough too. As an example, nylon/nylon has a coefficient of about 0.15, which seems quite slippery by comparison. I don't think we need to change Kevin's analysis unless this comes up in your discussions and they ask for more details.

Any thoughts?

CU,
Tom

On 3/5/12 8:52 AM, Leo Bellantoni wrote:

Dear Kurt,

There is a wall of iron in SeaQuest, called "The Iron Wall" between stations 3& 4. We would like to get this experiment an ORD PDQ. Will The Iron Wall need a seismic stability study? The experimenters have some rough calculations -

I distinctly remember discussion from my days in KTeV that a seismic stability study had to be done for the KTeV steel; that is not an issue.

Leo

Dr. Leo Bellantoni (630)730-2155

From: Russell A Rucinski <rucinski@fnal.gov>
Subject: RE: SeaQuest Final ORC Approval
Date: March 2, 2012 1:18:38 PM CST
To: Leo Bellantoni <bellanto@fnal.gov>

Hi Leo,

I took another look at the SeaQuest detector today and did not see anything different from my last walk thru. You have my positive endorsement of recommending operational readiness clearance.

Russ Rucinski
Mechanical Safety representative

From: Leo Bellantoni
Sent: Thursday, March 01, 2012 10:17 PM
To: Steve J Chappa; Eric D McHugh; Robert J Bushek; Karen M Kephart; Teri L Dykhuis; Walter F Jaskierny; James L. Priest; Russell A Rucinski; Paul E Reimer; Charles N Brown; David C Christian; Andy Stefanik; David R. Pushka; James R Kilmer; Gary L Lauten; Joseph W Howell; Robert J Woods; Tug T Arkan; Kathy J Graden; Michael I Geelhoed; Nathan J. Duff
Subject: Re: SeaQuest Final ORC Approval

My notes from today. Please correct as need be.

See (many of) you tomorrow.

Leo

Dr. Leo Bellantoni
(630)730-2155
MS 357, Fermilab Batavia, IL 60510

From: James R Kilmer <kilmer@fnal.gov>
Subject: **Recommendation to operate E906 H2 targets**
Date: March 5, 2012 9:31:44 AM CST
To: Michael A Lindgren <mlindgre@fnal.gov>, Roger L Dixon <roger@fnal.gov>
Cc: Leo Bellantoni <bellanto@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, John E Anderson Jr. <jea@fnal.gov>, Michael W Mcgee <mcgee@fnal.gov>, Thomas J Peterson <tommy@fnal.gov>, "James L. Priest" <priest@fnal.gov>
▶ 1 Attachment, 13.0 KB

Please find attached a recommendation from the H2 Target Safety Panel to allow operation of the E906 H2 Targets. I believe that because of the geographical placement of the target we will need OK's from both Division Heads for this target system to operate. Jim Kilmer for the panel


E906 Recom...ocx (13.0 KB)

From: Michael Lindgren <mlindgre@fnal.gov>
Date: March 5, 2012 2:41:07 PM CST
To: David Christian <dcc@fnal.gov>
Cc: Eric D McHugh <emchugh@fnal.gov>, Erik E Gottschalk <erik@fnal.gov>, Paul E Reimer <preimer@fnal.gov>, <d_johnson@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>, <geelhoed@fnal.gov>, <glauten@fnal.gov>, <wschmitt@fnal.gov>, <newhart@fnal.gov>, "Nathan J. Duff" <nduff@fnal.gov>, Richard Ford <rickford@fnal.gov>
Subject: **Re: SeaQuest ORC status & request**

Dear Dave,

I would like to get beam to SeaQuest as soon as possible, and as the question of CAL lists seems to be about to cause some holdups, I suggest a work around for the initial phases of beam and experiment commissioning.

As long as there is a period after beam is turned off for air activation measurements, and an AD person is going to come to NM4 and make a controlled access, there is no need to add additional procedures beyond following the current Fermilab controlled access procedure. I would like to revisit that once AD determines that their measurements are no longer needed. We can continue that discussion without causing any further delays in getting your experiment operating.

Mike

On 3/2/12 6:13 PM, David Christian wrote:
Hi Mike,

I had a conversation with Eric McHugh about controlled access by SeaQuest experimenters and he agrees with me that PPD should not require any procedure in addition to the Fermilab controlled access procedure. I would appreciate it if you would send email to the following list of people stating this as PPD policy:

Dan Johnson (d_johnson@fnal.gov), Leo Bellantoni (bellanto@fnal.gov), Mike Geelhoed (geelhoed@fnal.gov), Gary Lauten (glauten@fnal.gov), Wayne Schmitt (wschmitt@fnal.gov), Duane Newhart (newhart@fnal.gov), Nathan Duff (nduff@fnal.gov), and Rick Ford (rickford@fnal.gov).

Leo has a short punch list of questions and requests for people to write documentation that he has circulated. He says he wants to call one more meeting to review the answers & documents on Monday before recommending ORC.

- Dave

From: John E Anderson Jr. <jea@fnal.gov>
Subject: RE: Procedures & CAL list
Date: March 2, 2012 8:49:25 AM CST
To: David C Christian <dcc@fnal.gov>
Cc: Paul E Reimer <reimer@anl.gov>, Michael I Geelhoed <geelhoed@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>, Daniel A Johnson <d_johnson@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Wayne A Schmitt <wschmitt@fnal.gov>

Hello Dave,

The CAL List for SeaQuest seems to defeat the purpose of the CAL program if everyone is a CAL. I believe there should be a select few names that are responsible for authorizing and supervising accesses into the experimental hall.

In regard to the operating procedure, I'll point out that the FMAG is not interlocked to the radiation safety system for beam operations although it could be. We don't believe it needs to be interlocked from the radiological perspective.

John

-----Original Message-----

From: David C Christian
Sent: Thursday, March 01, 2012 5:20 PM
To: Leo Bellantoni
Cc: Paul E Reimer; David C Christian; Michael I Geelhoed; Gary L Lauten; John E Anderson Jr.
Subject: Procedures & CAL list

Hi Leo,

I lost the list of who I agreed to send this to, so please forward this to anyone who was supposed to be on the list & isn't!

Attached please find "Procedures for operation of SeaQuest & access into NM3 & NM4" and the SeaQuest "CAL" list, both dated 3/1 /12.

- Dave

From: "Nathan J. Duff" <nduff@fnal.gov>
Subject: RE: SeaQuest operations procedure review
Date: March 5, 2012 10:40:12 AM CST
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: Paul E Reimer <reimer@anl.gov>

Yes, that is correct.

- Nathan

From: Leo Bellantoni
Sent: Monday, March 05, 2012 10:39 AM
To: Nathan J. Duff
Cc: Paul E Reimer
Subject: Re: SeaQuest operations procedure review

Thank you Nathan. Now, as I recall from our phone conversation, while this is an important recommendation for the experimentors, you do feel this is not strictly necessary for the ORC which will cover beam tuning and initial commissioning, correct?

Leo

Dr. Leo Bellantoni (630)730-2155
MS 357, Fermilab Batavia, IL 60510

On Mar 5, 2012, at 10:22 AM, Nathan J. Duff wrote:

Hi Leo,

Regarding the general items which are currently stored in the

down-stairs portion of NM4; It is my recommendation that all unnecessary equipment or material be removed from the area surrounding the experimental target, magnet and detectors. This is due to the small (but greater-than-zero) chance of neutrons slipping through shielding cracks and activating the material. If items must be stored in the down-stairs portion, those items should be stored downstream of the old KTeV absorber (the big, grey battleship blocks). Please let me know if you have any questions or concerns.

Thank you,

Nathan Duff

PPD/RSO

x4742

From: Leo Bellantoni

Sent: Monday, March 05, 2012 10:13 AM

To: Eric D McHugh; Paul E Reimer; David C Christian; Michael I Geelhoed; Gary L Lauten; Nathan J. Duff; Aria Soha; William M Lee

Subject: Re: SeaQuest operations procedure review

This meeting will be in the 5th dimension.

No, you won't be needing to expand your metric to 5x5. But you will need your Fermilab ID badge to get into the D0 assembly building.

The main door to the D0 hall opens to the elevator and a staircase; that little landing there is the 4 and 1/2th floor. Go up 0.5 flights, bang a left and head on down to the end. It is not a large conference room, but it will do.

See you at 2PM

Leo

Dr. Leo Bellantoni

(630)730-2155

MS 357, Fermilab Batavia, IL 60510

From: David Christian <dcc@fnal.gov>
Subject: **Magnet PS configuration control**
Date: March 5, 2012 3:58:11 PM CST
To: 'Walter F Jaskierny' <waltj@fnal.gov>
Cc: Paul E Reimer <preimer@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>, David C Christian <dcc@fnal.gov>
▶ 1 Attachment, 170 KB

Hi Walt,

Please look at the attached "procedure" for configuration control of the KMAG and FMAG power supplies & let Leo know whether or not it is acceptable.

Thanks,
Dave

KMAG and FMAG Power Supply Configuration Control

The two power supplies for KMAG and the one power supply for FMAG are in NS7. When one of the magnets is going to be off for an extended period of time, a SeaQuest configuration control lock will be placed on the corresponding power supply or supplies to ensure that the magnet cannot be energized inadvertently. These three configuration control locks will be maintained by David Christian, Paul Reimer, and their designees.

Minutes of ORC meeting for SeaQuest, 1 Mar 2012

Attending

Leo Bellantoni, ORC committee chairman; Paul Reimer, Dave Christian SeaQuest; ORC committee members Karen Kephart, Teri Dykhuis, Angela Sands, Walter Jaskierny, Steve Chappa, Jim Priest; PPD SSO Eric McHugh; also Gary Lauten (AD/ESH Rad Safety) and Mike Geelhoed (AD/External Beamlines)

Version

These minutes written up by LB after the meeting, with various additional bits of information. They will be updated as needed. The file save-date is:

3/5/12 4:00 PM

Action items are highlighted like so.

Overture

SeaQuest had thought that they would be able to proceed with beam-tuneup without an ORC and discovered on 29 Feb 2012 that this was not true. This makes Operational Readiness Clearance the project's critical path.

The experiment maintains a status of inspections at http://www.phy.anl.gov/mep/SeaQuest/E906_internal/SeaQuest_Safety.html

Paul Reimer, Eric McHugh and LB met on 10 Jan and discussed what would be needed for final ORC and the summary of that meeting was reviewed in this one.

A follow-up / continuation is planned for 2 Mar 2012, 1PM.

Environmental & Toxic Materials

The NEPA for SeaQuest was approved back in 2010 and appears to still be correct. There has been some discussion by the experimenters that they may need to use a mixture of 82% Argon, 15% Isobutane, 3% Methylal and these gases are not called out in Section VI of the NEPA. This would be a flammable mixture (see below). The experimenters are however not requesting to use this mixture. At this time they are planning to use 88.3%

Argon, 7.7% Methane, 4.0% CF₄. This is covered by the NEPA and is a non-flammable mixture (see Fire, below).

There is some depleted Uranium in the hall from the KTeV experiment. According to Nathan Duff & Kathy Graden, it is fine to leave it there.

Teri Dykhuis and Angela Sands walked through the facility and did not observe any environmental issues that would prohibit their recommendation for ORC.

Angela requests that a monthly gas usage report be sent to her.

Electrical

The non-commercial electrical equipment other than that associated with the magnets (to wit, chamber electronics) was reviewed in the (partial) ORC dated 6 Feb 2012. The magnets (NM4AN and NM3S) were reviewed in the (partial) ORC of 23 May 2011.

Walt Jaskierny, Steve Chappa and Dave Christian walked through the facility and found no issues in the enclosure. In the control room however there were 2 or 3 occurrences of daisy-chained power strips or power strips connected by extension cords. There is also in the control room a UPS that powers a computer that needs to be labeled as such. Remediation of the daisy-chaining has occurred; the remediation of the UPS labeling has been verified.

During the meeting, a question was raised about the possibility that power panel lugs might not have been inspected correctly; poor lugs have caused problems in the past. Eric McHugh spoke with Leonard Nelson, building manager and learned that the annual panel preventive maintenance for the panels downstairs including thermal scanning was last done in Oct 2011; and the DHPs switchboards were cleaned, tightened and inspected in June 2011.

Fire, gas, etc.

The hall is equipped with VESDA, smoke detectors, and sprinklers, all commissioned and operational. The experiment will not use flammable gas. The gas mixture is made by purchasing 92% Argon 8% Ethane mixture and mixing it with 4% CF₄. These two being non-flammable there is no issue with that. Jim Priest has been working with the

experiment and was satisfied with the system for use with non-flammable gas at the start of the meeting.

There was a brief and potential important (but we hope irrelevant) discussion about what would be needed for the experiment to run with flammable gas: the gas shed would need upgrading, the hall would need gas detectors, and data on the detector's leak rates would be needed. The NEPA would have to be revisited. This is not known to be a complete list of things that would be needed in this scenario. Karen passes also to the experimenters the practical issue that Tygon tubing and most flammable gas mixtures are a poor combination - the ID of the Tygon will gum up.

Jim and Karen Kephart walked through the enclosure and found no issues.

Mechanical

The mechanical issues relating to tracking stations 1 and 3 were reviewed for the (partial) ORC issued 14 Feb 2012. Station 2 was covered in the (partial) ORC of 10 Jun 2011.

Station 4 remains an issue. LANL issued a revised engineering note on 29 Feb 2012. It is being reviewed by Andrew Stefanik of PPD/MechEng. There are some recommendations already known to be coming out of this:

1. Permanent warning signs attached at both hanger friction connections on the detectors with vertical tubes stating that the connection is a friction connection and the bolts must not be loosened when the detectors are hanging will be needed.
2. Some calculations in the engineering note remain to be finished.
3. The calculations reveal weak connections where the lifting frame bolts to the detector frame when the frame is rotated from the horizontal to the vertical position - an operation which has in fact already been done.

On 2 Mar, Russ Rucinski and Andy Stefanik examined station 4 and gave me a verbal OK that adequate remediation was in place. I still have an email from Andy from a day earlier that there is some work that remains to be done on the EN, although it does not stand in the way of getting beam. *I will issue an ORC for the 4 July, and to touch base with Andy before re-issuing the post-shutdown ORC. The plan is that there will be 2 more tracking chambers in place for that run anyway; also*

by that point we will want a Quiz for the Hazard Awareness and a cleanup of the hall.

A second remaining open issue has to do with the "Iron Wall" which was installed for SeaQuest. There is also a "Battleship Grey" wall and some further grey steel left in the hall from the muon system of KTeV. What, if anything, is needed here? Seismic stability studies have those been done. Eric McHugh was of the view that the KTeV era metal could be exempted from further debate.

A third remaining issue is that there is a fall hazard on the raised floor of the old KTeV HVAC area. This was announced as remedied in the course of the meeting; then on 2 Mar 2012 LB looked at the remediation and thinks that it is fine.

Target

The experiment has primary beam through NM3 and a target at the juncture between NM3 and NM4. This has been reviewed by a committee under the supervision of Jim Kilmer; they have a positive recommendation, except for certain signs which are now in place. What remains to be done is for Jim to meet with LB and Eric McHugh to go over what was covered in the target committee and to ensure that the experimental ORC committee covers the complement thereof.

Jim Kilmer and LB did this on 2 Mar. There is one rack which probably but not definitively looked at by the electrical experts on the ORC committee; an email with photos asking if this rack has indeed been examined was fired off shortly thereafter. Steve Chappa has verified that this rack is OK the morning of 5 Mar 2012.

Procedures

One of the outcomes of the meeting of 10 Jan 2012 was a stated need for operational and emergency procedures for the experiment's shift crews and run coordinators. The ORC committee chair is concerned about the need for clear communication and agreed upon procedures between the experiment and AD/Ops; he cited the confusion about the need for an ORC prior to beam tuning as an example of how we would all not like to do it.

In the course of the discussion, Gary Lauten informed us (1) that after beam has been run through the hall a 1 - hour cooloff time would be needed after shutting off the beam before entering (concerns re. potential airborne radiation raised in the shielding assessment process) and that (2) he or one of his rad techs, would like to be the first person to enter NM3 & NM4 in that case. Will there be an RWP for NM4 Controlled Access? This is up to Gary Lauten and Nathan Duff. Not at first.

There was also a discussion about the settings of the upstream sweeper magnet. Shielding calculations have been done assuming the magnet is energized up to saturation of the iron thereof; should MCR have some verification that this magnet is on before sending beam? Email and phone conversation with John Anderson after the meeting reveal that from his point of view, it is not needed based on shielding calculations by Wayne Schmitt. Further cleanup is nor, in Nathan's opinion, is needed for the ORC, but as a good procedure we agree that this will be addressed during the shutdown.

There was a lengthy discussion as to what documentation & procedures are required, how it should be reviewed, and, in some regards, as to what the procedures should be. From that discussion, earlier emails, the text of the target committee's recommendations, and later communications:

1. The rad-safety officers are Gary Lauten for NM3 and Nathan Duff for NM4; both names will be on the ORC sign-off sheet.
2. Leo has sent to Paul Reimer and Dave Christian the Hazard Awareness training used in FTBF and D0.
3. A call list exists in the control room and has been made available to Mary Kohler.
4. It is our understanding that scenarios such as of failure of the target to move, leaks from the target etc. have been reviewed by the target committee and that the design of the target and its associated systems are to take the proper action without any action on the part of the experimental control room staff. Indeed, we have the target review committee's report at <http://projects-docdb.fnal.gov/cgi-bin/ShowDocument?docid=1196>

Documents to be drawn up and reviewed:

a) Hazard awareness training for everyone in the control room. At this time, the stairwells are designated tornado refuges as are the bathrooms. However they are only marked as such at the bottom of the stairs, rather than at the top. If the stairwells are used, it is conceivable that people evading a tornado could enter the hall at a time where less than 1 hour of cool-down has occurred. However, the plan is to have the control room crew take a Hazard Awareness that points out that after beam has been run in the hall, the

stairwells are no longer tornado shelters. The Hazard Awareness documentation was reviewed 5 Mar 2012 by LB, McHugh, Bill Lee, Aria Soha, Nathan Duff and Wayne Schmitt.

b) Procedure for FMag and KMag energization need to be OK'd by Walt Jaskierny

The start of shift procedure is the responsibility of the experiment; it will include a check of FMag setting and a courtesy call to the control room; again the FMag setting is not a rad safety issue.

Re controlled access procedure: 1 hour cooldown and rad survey are the initial procedure which can be changed by the AD/RSO.

For the CAL list debate the PPD ORC review accepts the suggestion of Mike Lindgren in his email of 5 March 2012.