Operational Readiness Clearance
T-1058 Secondary Emission Calorimetry
22 Aug 2014

AUTHORIZATION TO PROCEED WITH THE REMOTE OPERATION OF T-1058 IN FTBF

REVIEWED AND APPROVED BY: **DATE**

K.M. Kephart — 08/22/14
Particle Physics Division Head
Comments/Exceptions:

S Wagner 11291 — 8/22/14
Accelerator Division Head
Comments/Exceptions:

Daniel Johnson 5157 — 8/22/14
Accelerator Division Operations Department Head
Comments/Exceptions:

Wayne Schmidt — 8/22/14
Accelerator Division Radiation Safety Officer
Comments/Exceptions:

Madelyn Wolz 163444N — Aug 22, 2014
Particle Physics Senior Safety Officer
Comments/Exceptions: for Eric McHugh

Leo Bellantoni — 22 Aug 2014
Committee Chair
Comments/Exceptions: NOT VALID AFTER SEPT-OCT 2014 SHUTDOWN

Fermilab Test Beam Coordinator — 8/22/14
Comments/Exceptions:

Submitted By:

Anatoly Rohzhin — 22 Aug 2014
Requester Anatoly Rohzhin

Electronic approvals for this form are acceptable. Please forward your responses to all recipients. 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.

Rev Aug 2008

Steve J Chappa <chappa@fnal.gov> August 22, 2014 3:18 PM
Leo Bellantoni <bellanto@fnal.gov>, David Mertz <mertz@fnal.gov>
Aria Soha <aria@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>
RE: T-1058 is ready!

Hi Dr. Leo,
Yes, T1058 is Ok for operation. T1015 has made the corrections suggested and they are OK to run if they need to over the weekend.
Later,
Steve

From: Leo Bellantoni
Sent: Friday, August 22, 2014 2:57 PM
To: Steve J Chappa; David Mertz
Cc: Aria Soha; Eric D McHugh
Subject: Re: T-1058 is ready!

Hi Steve

To be certain: Our conversation in the hall was to the effect that you recommend operation

Thanks,
Leo

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

On Aug 22, 2014, at 2:19 PM, Steve J Chappa <chappa@fnal.gov>
wrote:

Hi Aria, Leo,

For T1058:

I verified the two cables that have the MHV connectors on it. They do mate up properly with the flange MHV connectors. The labels are adequate and relay the required information. Therefore, for this run of T1058 only, these connectors are permitted to be used.

Second, the amplifier setup will require an inline fuse. The 12 VDC power comes from a bench supply that can output a maximum of 5 amps. The RG58 cable is OK at 5 amps but the fanout into 3 RG174 cables and LEMO style connectors are not rated for 5 amps. a LEMO style connector is generally rated for no more than 1.5 amps. Therefore, a fuse no larger in value than 1.5 amps is **required** to be placed at the power supply output lead. Also, since the DC is carried by coaxial cable similar to that used for signals, both ends of the cable is **required** to be labeled as DC power at 12 V. Other aspects of the amplifier addition, placement, etc., look OK.

Steve J Chappa <chappa@fnal.gov> August 22, 2014 2:13 PM
Aria Soha <aria@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>
Anatoly Ronzhin <ronzhin@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Henry J Frisch <frisch@hep.uchicago.edu>
RE: T-1058 is ready!

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Once these two corrections are made, I can visually verify their completion and then I can recommend that this installation be issued the ORC.

For T1015:

The electronics setup and cabling are almost complete. Therefore, I can do a re-inspection prior to the weekend of the corrective actions suggested in a prior advisory review (DC power split-up wiring, grounding (NO floating pieces of metal) configuration, and cabling dress).

A review of the "Power" PC board shows three regulators with fuses (for current protection for the FPGAs) at the regulator's output but no fuse protection at the DC power input connector. Therefore, to provide over-current protection for the PCB, the input DC power cables will be fused. The power supply used can put out 10 amps but the DC lead wires are 18 AWG (rated for 12 amps) and the Molex power connector looks to have 15 amp post on them but if a regulator's input shorts out or some other short happens on the PCB, the board will smoke. The power supply is limited to 5 amps but if a short does happen, the power supply can put out 5 amps all day and this will damage the PC board. The fusing on the input power leads, therefore provides the over-current protection for the PCB.

Regards,
Steve

From: Aria Soha
Sent: Friday, August 22, 2014 10:08 AM
To: Steve J Chappa; Leo Bellantoni
Cc: Anatoly Ronzhin; Eric D McHugh
Subject: T-1058 is ready!

Hi Steve, Leo,
There is no beam all day to day due to the lightning storm last night.
Anatoly has confirmed he has the correct cables, for HV now, and has installed them. Could you please stop out at test beam and take a look, so we can finish up the approval process?
I should be there around 10:30...
(Hot dogs at 11:30)

From: Steve J Chappa <chappa@fnal.gov>
Subject: RE: ORC Status
Date: August 21, 2014 4:25:41 PM CDT
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: Eugene E Schmidt Jr <jj@fnal.gov>, Aria Soha <aria@fnal.gov>, Karen M Kephart <karenk@fnal.gov>, David Mertz <mertz@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Tug T Arkan <arkan@fnal.gov>, "James L. Priest" <priest@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Ryan A Rivera <rrivera@fnal.gov>, Andrew Brandt <brandta@uta.edu>, Eric Oberla <ejo@uchicago.edu>, Corrado Gatto <gatto@fnal.gov>, Anatoly Ronzhin <ronzhin@fnal.gov>

Hi Dr. Leo,
OK, now for the rest of the story. During the ORC reviews conducted this morning at FTBF at 11:00, I found:

For T1058 (located in the section 2C enclosure):

1) A loop of about four cables with unused connectors are nor secured and located at the top of the detector HV flanges. **Require** that these cables be secured and the connectors taped/insulated. Done during the review. –OK.

2) The table's position is out of the beam path but the cables, HV and power cord, are dressed with no slack. Therefore, when the table is moved into position, the cables will be pulling on the connectors and there will not be enough cable slack to allow for the table's travel. **Require** that the cables be loosen, the table's travel be adjusted, the table's stops installed, and the cables redressed with the proper slack. This was completed and verified on a follow-up check conducted later this afternoon. –OK.

3) The HV connectors on the detector vessel's flange were found to be incompatible with the facility's HV cable connectors. These flange connectors were of the wrong sex and also are MHV style connectors. FESHM chapter 5045, requirement #3, prohibits the use of MHV style connectors for use with HV. Therefore, to help get this particular installation operational for **this time only**, **Require that**:

1) The flange MHV connector voltage rating be checked to verify a rating of 2KV or more. This was verified. The connector is rated for 5 KV.

2) A patch cable, red in color, be fabricated with the proper connector end to mate with the flange MHV connector, also with proper rating.

3) The flange connector to be used and the cable's mating connector be clearly labeled as to be used **specific and only for this installation and position.**

4) After this, the cable connection and fabrication be inspected for proper implementation of the above steps.

5) No subsequent MHV connections or cables will be allowed to be added to this installation.

Upon the completion of this installation's run and when the detector vessel is removed, it will not be allowed for re-installation or use until the proper SHV connectors are installed on the flanges.

Until the steps in (3) are implemented and re-inspected, I recommend that this

David Mertz <mertz@fnal.gov> August 21, 2014 4:34 PM
To: Leo Bellantoni <bellanto@fnal.gov>
Cc: Eugene E Schmidt Jr <jj@fnal.gov>, Aria Soha <aria@fnal.gov>, Karen M Kephart <karenk@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Tug T Arkan <arkan@fnal.gov>, "James L. Priest" <priest@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Ryan A Rivera <rrivera@fnal.gov>, Andrew Brandt <brandta@uta.edu>, Eric Oberla <ejo@uchicago.edu>, Corrado Gatto <gatto@fnal.gov>, Anatoly Ronzhin <ronzhin@fnal.gov>, Steve J Chappa <chappa@fnal.gov>
RE: ORC Status

I (unsurprisingly) concur with Steve's summary below, also noting that T1015 included a PMT with a spring-loaded metal cap and exposed metal on its tube. Based on measurements taken during inspection, the cap appeared to be connected through resistance to the exterior portion of the HV connector, which will be connected to the barrel of the (grounded) HV cable. This is acceptable. The exposed metal on the tube did not appear to be grounded and should either be grounded of insulate d to prevent incidental contact.

Thanks

Dave

David E. Mertz, P. E. / MS119
Electrical Engineer, SME
ESH&Q Section
Direct 630.840.6322
Mobile. 630.352.7461
Fax 630.840.3390
mertz@fnal.gov

From: Steve J Chappa
Sent: Thursday, August 21, 2014 4:26 PM
To: Leo Bellantoni
Cc: Eugene E Schmidt Jr; Aria Soha; Karen M Kephart; David Mertz; Eric D McHugh; Tug T Arkan; James L. Priest; Gary L Lauten; Ryan A Rivera; Andrew Brandt; Eric Oberla; Corrado Gatto; Anatoly Ronzhin
Subject: RE: ORC Status

Hi Dr. Leo,
OK, now for the rest of the story. During the ORC reviews conducted this morning at FTBF at 11:00, I found:

For T992 (the Si telescope, located in the upstream hut):

1) A new PC board, with the 3-D ASIC mounted on it, was added to the downstream end of the telescope. Powering this PCB was a National PXI crate that uses PX- 4110 modules. The max output of these modules for the low-level DC power is 1 amp. Thus, the wires used (ribbon cable for in-series current monitoring) does not have their ampacity exceeded. –OK.

2) There were several cables, RG58 used for power, ribbon cables, etc., that were loose and causing stress to be put on some small connectors. **Recommend** that the cables be checked for proper strain relief. Done during the review. –OK.

3) **Required** that the AC cord for the chiller be placed inside of the trip strip. Done during the review. –OK.

Thus with the required corrective actions completed, I recommend that this installation be issued the ORC.

For T958 (located in the upstream hut):

1) HV used. Source is the Caen NIM module. Red RG58 used. –OK.

Tug T Arkan <arkan@fnal.gov> August 21, 2014 2:32 PM
To: Karen M Kephart <karenk@fnal.gov>, Leo Bellantoni <bellanto@fnal.gov>, Russell A Rucinski <rucinski@fnal.gov>, Angela M Aparicio <asands@fnal.gov>, Madelyn Wolter <maddiew@fnal.gov>, Kathy J Graden <graden@fnal.gov>, David Mertz <mertz@fnal.gov>, Robert J Bushek <bushek@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Steve J Chappa <chappa@fnal.gov>, "James L. Priest" <priest@fnal.gov>, Teri L Dykhuis <dykhuis@fnal.gov>
Cc: Eugene E Schmidt Jr <jj@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Anatoly Ronzhin <ronzhin@fnal.gov>
RE: T1058 ORC

Hi Leo,
I looked at the vacuum chamber and discussed with Anatoly. I do not see any safety concerns to the personnel with the current vacuum chamber & system setup.
Thanks,
Tug

From: Karen M Kephart
Sent: Thursday, August 21, 2014 2:03 PM
To: Leo Bellantoni; Russell A Rucinski; Angela M Aparicio; Madelyn Wolter; Kathy J Graden; David Mertz; Robert J Bushek; Eric D McHugh; Steve J Chappa; Tug T Arkan; James L. Priest; Teri L Dykhuis
Cc: Eugene E Schmidt Jr; Gary L Lauten; Anatoly Ronzhin
Subject: T1058 ORC

T1058: Secondary Emission Calorimetry. Contact person is Anatoly Ronzhin, working with Henry Frisch. Identified hazards are HV & custom electronics (documentation exists!) and a vacuum vessel which, according to Jim Kilmer, "However I'm really not concerned with this window at all. It is a commercial window sold by MDC. In fact the whole system is too small a volume to be included in our safety standard in the FESHM. And our chapter on windows doesn't say we need to consider commercially available windows." In principle, I need an OK from Tug and Russ to sign off on this one but it does seem pretty straightforward. I will send them some other email under separate cover. I believe they are in MT6.2

This test apparatus was not yet centered on the beam, and the cables were already somewhat dressed. They needed to be loosened so the stage could be moved. In the final configuration the remote motion is advertised as +/- ~ 2". Stops must be changed to limit the travel to only slightly more than this aperture once the device is centered. Cables will need to be re-dressed, and the stage operated while attended before it can be operated remotely.

ORC will not be recommended until a visual of completion of the above requirements has been performed. Steve Chappa will recheck, and I will defer to his judgment at that point.

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

Karen M Kephart <karenk@fnal.gov>

August 21, 2014 2:03 PM

To: Leo Bellantoni <bellanto@fnal.gov>, Russell A Rucinski <rucinski@fnal.gov>, Angela M Aparicio <asands@fnal.gov>, Madelyn Wolter <maddiew@fnal.gov>, Kathy J Graden <graden@fnal.gov>, David Mertz <mertz@fnal.gov>, Robert J Bushek <bushek@fnal.gov>, Eric D McHugh <emchugh@fnal.gov>, Steve J Chappa <chappa@fnal.gov>, Tug T Arkan <arkan@fnal.gov>, "James L. Priest" <priest@fnal.gov>, Teri L Dykhuis <dykhuis@fnal.gov>

Cc: Eugene E Schmidt Jr <jj@fnal.gov>, Gary L Lauten <glauten@fnal.gov>, Anatoly Ronzhin <ronzhin@fnal.gov>

T1058 ORC

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

"James L. Priest" <priest@fnal.gov> August 21, 2014 12:14 PM
To: Leo Bellantoni
ORC FTBF T992, 958, 1058, 1015, 1058

1. The paper used for leaking testing in the upstream experiment needs to be removed if reapplied when running. It was removed during review
2. General to all experiments:
A. Signs identifying each experiment and responsible parties needs to be posted at each experiment.
3. The fire dept needs to be notified of the new experiments. A photo or two would be good. I don't think they need to tourer as I did not see access issues with the setupd.

Jim

James Priest PhD
Sr. Fire Strategist / Researcher
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