

**LUKE Test Installation at Proton Assembly Building**  
**Operational Readiness Clearance**  
**August 20, 2007**

AUTHORIZATION TO PROCEED WITH THE UNATTENDED OPERATION OF THE LUKE TEST  
INSTALLATION IN THE PROTON ASSEMBLY BUILDING.

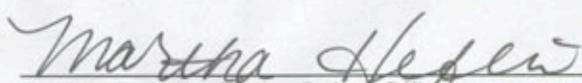
**REVIEWED AND APPROVED BY:**

**DATE**

  
\_\_\_\_\_  
Particle Physics Division Head

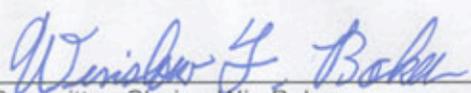
21 Aug 07

Comments/Exceptions:

  
\_\_\_\_\_  
Particle Physics Senior Safety Officer

8/20/07

Comments/Exceptions:

  
\_\_\_\_\_  
Committee Chair - Win Baker

8/21/07

Comments/Exceptions:

**Submitted By:**

  
\_\_\_\_\_  
Requester - Stephen Pordes

8/20/07

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.

**Martha Heflin**

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**From:** "Winslow Baker" <winbaker@fnal.gov>  
**To:** <martha@fnal.gov>  
**Cc:** <schuh@fnal.gov>; <dcc@fnal.gov>; <stephen@fnal.gov>; <tope@fnal.gov>  
**Sent:** Monday, August 20, 2007 9:53 AM  
**Attach:** FLARE Test Station Safety Review.eml  
**Subject:** Fwd: FLARE Test Station Safety Review

Hi Martha,

OK. I guess we have this sorted out. Steve Chappa has inspected the LUKE test setup in PAB and recommended approval; I will forward it to you. Everything else, I believe, is covered by Phil Pfund's recommendation and documentation that he sights (below). I visited the installation also and recommend approval.

Would you please prepare a sign-off sheet? I would suggest a title "Operational Readiness Clearance for the Unattended Operation of the LUKE Test Installation in the Proton Assembly Building". Stephen Pordes is the requester. This does not involve the Accelerator Division, so just PPD people need to sign.

Thanks,

Win

**Martha Heflin**

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**From:** "Stephen Pordes" <stephen@fnal.gov>  
**To:** "Steven J. Chappa" <chappa@fnal.gov>  
**Cc:** "Winslow Baker" <winbaker@fnal.gov>; <lar\_at\_fnal@fnal.gov>; <tope@fnal.gov>; <waltj@fnal.gov>; <clk@fnal.gov>; <stephen@fnal.gov>; "Bob DeMaat" <demaat@fnal.gov>  
**Sent:** Friday, August 17, 2007 10:02 PM  
**Subject:** Re: Review for the Luke station in the Proton assembly building

Dear Steve and Win,

thank you for your prompt responses. We have taken care of the issues Steve brought up - as he notes. And yes, the system he looked at (Luke) is the system for which Jim Strait wants us to obtain an ORC. In practice, we do not plan to operate the electronics unattended but it was very helpful of Steve to do his review. In the future, we will be requesting an ORC for our second system (Bo) which we will want to operate unattended and has a larger electronics setup. I expect this will be towards the end of the accelerator shutdown (early October).

Again, many thanks.

Stephen

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

**From:** "Steven J. Chappa" <chappa@fnal.gov>  
**Date:** Friday, August 17, 2007 7:02 pm  
**Subject:** Review for the Luke station in the Proton assembly building  
**To:** Winslow Baker <winbaker@fnal.gov>  
**Cc:** [Stephen@fnal.gov](mailto:Stephen@fnal.gov), Bob DeMaat <demaat@fnal.gov>

> Hi Win,

>  
 > Yesterday, Stephen Pordes requested a review for the LUKE Material  
 > Test System located in the Proton Assembly Building. I went out there  
 > at 3:30 to conduct the review. During the review Stephen and Walter  
 > Jaskierney were present for questions and discussion. I reviewed only  
 > one rack of equipment and wiring going to just one of the purifier  
 > units. There is more to be installed but this was not completed yet.  
 > Thus, I am not sure if my recommendations apply for the ORC that they  
 > are seeking for the whole installation or if I will need to do another  
 > review(s) in order for them to get their ORC. You may have to talk  
 > with Stephen about this.

>

> Anyway, of what I reviewed, I found:

>

> 1) The custom HV NIM modules to be used were opened up and inspected.  
 > The purity monitor module used required NIM power and it was confirmed  
 > to be fuse-protected. The other module was passive and thus required  
 > no power. The input and output HV bulkhead jacks were isolated from  
 > the NIM modules' chassis GND. However, operational parameters required  
 > that the cable's shield be single point GNDed at the source. The  
 > custom HV NIM modules carried this shield GND through the modules and  
 > into the purifier unit. The HV source used are two NIM units from PREP  
 > that do have the shield grounded to its chassis metal. Thus, the HV

> connections are OK.

>

> 2) Another HV source is used for a commercial Flashlamp power supply.

> The HV terminals going into the power supply are not enclosed by the

> case metal or cable shield and thus the "hot" lead is not protected.

> In addition, the unit is sitting on top of the rack without being

> enclosed. Thus, I required that a cover be placed over this

> connector/terminal area of the power supply chassis. This was verified

> by a short follow-up inspection I did this afternoon. This looks OK.

>

> 3) During the review, I noticed that some electrical wiring was

> hanging down from a junction box that was placed near the rack and the

> wires are directly in a people traffic area. The ends of these wires

> were loosely taped but copper can be seen. This constitutes exposed

> wires that could be live. The wires come from a conduit that is in

> turn run to a breaker panel. By visual inspection, these wires were

> for a 3-phase circuit and a single phase circuit. There were no labels

> on the wires nor were there any labels or lock-out devices on any

> breakers in the panel. It did not appear that these wires were live

> and the circuit breaker used (after an inquiry of surrounding

> personnel) was apparently turned off. However, in my judgment, this is

> an electrical hazard and required that immediate corrective action be

> taken to ensure that no person could unknowingly touch a live 110 or

> 220 VAC wire. Thus, the wires were coiled up, placed in a bag, and

> tie-wrapped to the conduit in order to prevent inadvertent contact by

> people walking near the installation. Also, this situation needs to be

> brought to the attention of whoever left the wires in this condition

> so that proper safety and LOTO practices can be observed. In my

> opinion, one should NOT leave exposed wiring in a people traffic area

> without proper labeling and making assurances that these wires cannot

> unknowingly be turned live through the turning on of an unsecured breaker.

>

> 4) There were some other minor recommendations involving some power

> cords but the rest of the rack's equipment and its installation looks

> OK.

>

> Therefore, if what I looked at constitutes the installation for which

> Stephen is seeking an ORC, then, electrically, I recommend that they

> can operated the installed equipment unattended. If further parts of

> the installation needs looking at, then I will conduct the additional

> review(s) when they request them.

>

> Regards,

> Steve Chappa

To: Win Baker  
Particle Physics Division

From: Phil Pfund  
Chair, Village & Misc. Cryogenic Safety Review Panel

Subject: PAB FLARE Safety Review

Dear Win,

The Village & Misc. Cryogenic Safety Review Panel has completed its review of the FLARE liquid argon materials test station in the Proton Assembly Building (PAB).

Our review consisted of:

- Introduction and orientation walk-through on April 5, 2007.
- Review of safety related documentation. The documentation and updates are maintained by Terry Tope at: <http://lartpc-docdb.fnal.gov:8080/cgi-bin/ShowDocument?docid=265> login: lartpc , password: argon! The documentation consisted of:
  - System description
  - Flow schematic
  - Instrument and valve summary
  - System control loops
  - Fill procedure
  - FMEA – failure modes and effects analysis
  - “What-if” analysis
  - ODH analysis
  - “Luke” pressure vessel note
  - Liquid nitrogen pressure vessel note
  - Liquid nitrogen dewar compliance
  - Piping relief valves
  - LN2 relief valves
  - Material stresses
- Individual panel member meetings and e-mail exchanges with Terry Tope resulting in updates to the documentation listed above. In a few instances these resulted in changes to the hardware, also documented.
- Meeting to discuss final comments and walk-through with safety panel on June 15, 2007.
- Meeting with panel to review completion of “to-do” list and final walk-through on August 7, 2007. The walk-through resulted in two action items, both of which were reported complete on August 6, 2007:

- A caution tag was attached to the on/off "blade" switch on the box that provides power to the ODH fan.
- The window on the material lock was replaced by a blank 8 inch conflat flange.

Based on the above listed review activities, we are satisfied that the proposed test set-up can be operated safely. We recommend that you authorize the operation.

It should be noted that two future modifications are planned. (1) The window for the material lock will be reinstalled after sufficient work has been done to ensure its safe operation at cryogenic temperatures. (2) A second pressure vessel, referred to as "Cousin Bo", will be added to the system after the normal operational and safety related documentation has been developed. Each of these modifications is to be reviewed by this panel before this panel makes a recommendation to operate with either them in the system.

Regards,

Phil Pfund

On behalf of the Village & Misc. Cryogenic Safety Review Panel

Copy: Terry Tope  
Panel Members (Brian DeGraff, Tom Page, Dave Pushka)