

Prepared by: Wencan Xu

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Reviewed by: Dana Davis

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Approved by: T. Roser

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Date: 5/12/14

**ERL RSC Check-Off List for Low Power Beam Testing of the ERL SRF  
electron gun**

**Completion of this ERL RSC Check-Off List is a prerequisite for beam testing.**

Upon completion of this check-off list in the MCR, the ERL cold emission testing (CET) of the SRF electron gun may commence.

1. \_\_\_\_ (LP) **RSC LOTO has been applied to prevent the 1 MW klystron from being energized. This or equivalent must remain in place until the check-off list is complete.**
2. \_\_\_\_ (LP) RSC LOTO has been applied to prevent excitation of five-cell cavity.
3. \_\_\_\_ (LP) C-AD OPM 2.5.6 must be followed for the low power test.
4. \_\_\_\_ (LP) Sweep procedure in place for the blockhouse and west area.
5. \_\_\_\_ (IG) Chipmunk operation verified.
6. \_\_\_\_ (IG) Chipmunk alarm and interlock levels checked against table below.
7. \_\_\_\_ (LE) ERL block house shielding and barriers inspected and acceptable low power beam operations
8. \_\_\_\_ (LE) ERL block house shielding prints approved.
9. \_\_\_\_ (LE) Barriers are in place at both ends of the trench and posted.
10. \_\_\_\_ (LE) The ladder at the power supply house has a locked barrier and is posted.
11. \_\_\_\_ (LE) Access panel on side of electronic room is locked closed.

12. \_\_\_\_ (RCD) Second floor access panel posted with "HP escort required when ERL is operating. Contact ERL control room at ext 3135 for operating status"
13. \_\_\_\_ (RCD) Post area between West wall of the ERL and building wall as "HP escort required when ERL is operating. Contact ERL control room at ext 3135 for operating status"
- 14.
15. \_\_\_\_ (ACG) Chipmunks required for CET have interlock function checked. (See attached list).
16. \_\_\_\_ (ACG) PASS test is complete for ERL.
17. \_\_\_\_ (ACG) State Tables approved for ERL beam operations.
18. \_\_\_\_ (ACG) PASS wiring prints approved.
19. \_\_\_\_ (ACG) PASS software under configuration management.
20. \_\_\_\_ (RCD) Entrance gates to Building 912 NEEBA as "Controlled Area, TLD required for entry.
21. \_\_\_\_ (RCD) East side support building, first and second floors posted "HP escort required when ERL is operating. Contact ERL control room at ext 3135 for operating status"
22. \_\_\_\_ (LE) Area surrounding ERL is posted as no ladders/no climbing.
23. \_\_\_\_ (LE) First dipole after gun is RS LOTOed off.
24. \_\_\_\_ (ACG) All bypasses or temporary jumpers in place have been discussed with RSCC.
25. \_\_\_\_ (ACG) ODH interlocks certified.
26. \_\_\_\_ (RSCC) Chipmunk response reviewed for low power test.
27. \_\_\_\_ (RSCC) ERL shielding has been examined and found acceptable.
28. \_\_\_\_ (RSCC) Building roof requirements given to LE and RCD.
29. \_\_\_\_ (RSCC) Radiation survey precautions discussed with RCD.
30. \_\_\_\_ (RSCC) Chipmunk response for low power tests acceptable.
31. \_\_\_\_ (RSCC) Seam analysis and penetration updates provided to RSC for low power test.

32. \_\_\_\_ (RCD) Building roof over ERL posted " No access to this area of roof when ERL is operating. Contact ERL control room at ext. 3135 for operating status".
33. \_\_\_\_ (CEE) Conditions from review of Laser and ICT for beam intensity completed, as per review memo.
34. \_\_\_\_ (LP) Blockhouse and west fenced areas have been verified as swept.
35. \_\_\_\_ (LP) Five-cell Cavity RS LOTOed off.
36. \_\_\_\_ (LP) A procedure provides operators instruction for responding to ICT interlocks.
37. \_\_\_\_ (LP) Access procedure for locked west area to ensure any accesses do not leave the area unlocked without requiring a sweep of ERL.
38. \_\_\_\_ (LP) LP will notify R. Karol or E. Lessard when beam operations begin.
39. \_\_\_\_ (LP) ERL ready for low power test.
40. \_\_\_\_ (OC) List completion verified by on-duty operations coordinator.

**When the list above is complete then the ERL SRF electron gun may begin operations with beam.**

**The on-duty RCT needs to be in the area to conduct surveys of the shielding and penetrations. After the surveys have been reviewed, the configuration of the area posting near the ERL block house will be determined. A detailed survey will be conducted and documented after stable operations of the gun at 1W are achieved.**

RCD	Radiological Control Division: P. Bergh or designee
LE	Liaison Engineer: D. Phillips or designee
LP	Liaison Physicist: D. Kayran or designee
MCRGL	MCR Group Leader: P. Ingrassia or designee
RSCC	Radiation Safety Committee Chairperson: D. Beavis or designee
OC	Operations Coordinator
ACG	Access Control Group: J. Reich or designee
RCT	Radiation Control Technician
IG	Instrumentation Group: M. Minty or designee
CEE	Chief Electrical Engineer: J. Sandberg or designee
RGDC	C-AD RGD Custodian: A. Etkin or designee

**CHIPMUNKS**

Name	Location	Interlock [mrem/hr]	Alarm [mrem/hr]
NMO170	North Labyrinth	2.5	1
NMO171	North Gate	2.5	1
NMO172	1 MW Waveguide port	2.5	1
NMO173	50 kW Waveguide area	2.5	1
NMO174	West cryo pipe exit	2.5	1
NMO175	South Gate	2.5	1
NMO176	South Labyrinth	2.5	1
NMO177	Internal to ERL1	-	-
NMO178	Internal to ERL 2	-	-
NMO181	Gun power limit	20	10
NMO182	Power limit gun and dump	20	10