



OPERATING PROCEDURE FOR THE ER HIGH VOLTAGE SYSTEM OF THE PHENIX RICH DETECTOR

procedure name

PHENIX Procedure No. PP-2.5.2.7-05

Revision: A

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Hand Processed Changes

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Approvals

[Signature] 5/12/99
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REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	WRITTEN BY	APPROVED BY	TYPED BY
A	First Issue	5/11/1999	n/a	W. Lenz, 2 others unitelligible.	n/a
RETIRED	Procedure no longer needed, ER run completed.	3/6/2007	(Retirement note written by. D.Lynch)	Retirement approved by D. Lynch, R. Pisani and P. Giannotti for the PHENIX experiment	n/a

1.0 Purpose

This document describes the operating and emergency procedures for the High Voltage System for the PHENIX RICH Detector during the Engineering Run (ER) and the first year physics running. In those periods, the RICH detector gas vessels are filled with carbon dioxide (CO₂) radiator. As RICH detector is filled with CO₂, there is essentially no danger of fire or danger to personnel. The main purpose of this procedure is to protect the detector itself.

2.0 Responsibilities

In normal circumstances, only personnel authorized for the operation operate the RICH high voltage system. The list of authorized personnel is maintained by the PHENIX RICH subsystem. In an emergency situation, the PHENIX shift crew turns off the RICH HV.

3.0 Precautions

High voltage is used only for the RICH PMTs. The PMTs are housed in gas vessels that are filled with CO₂ gas during operation. The HV power supplies are housed in closed electrical racks whose doors are closed when HV is turned on. There is no danger of damage to the RICH due to overheating of the PMTs. Tests have shown that the PMT array temperature will rise to only 95 F even without water cooling.

4.0 Operating procedure

4.1 Turn on the RICH HV

1. The RICH gas vessels is filled with CO₂ as for PHENIX procedure No. PP-2.5.2.7-04 (RICH CO₂ Gas System Operating Procedure). Turn on the cooling water of the RICH PMTs. The HV electric racks should be closed.
2. Turn on and slowly ramp up one HV channel, which supplies 8 PMTs. The ramp up starts with a high voltage well below the nominal operating voltage. In each ramp up step, verify that there is no significant light leak. Repeat the ramp up steps until the HV reaches the nominal operating voltage.
3. Turn on one super-module (4 HV channels and 32 PMTs) and ramp up the HV slowly to the nominal operating voltage. Verify that all channels are working properly.
4. Repeat steps 2 and 3 for the super-module N0, N19, N39, S0, S19 and S39. This is to assure that there is no significant light leak. This step is skipped during the Engineering Run since only a small part of the RICH is turned on.
5. Turn on the remaining super-modules and set the HV to the nominal

operating voltage. Verify that the modules are working properly. Verify that the internal temperature of the RICH is appropriate. If any localized problem (bad HV channel, too much current, etc) is found, shut off the HV channel that has a problem.

4.2 High voltage turn off

Turn off the HV power supply for the RICH.

5. Emergency procedure

There are the following situations that threaten the RICH detector when its HV is turned on.

- (1) Presence of O₂ in the vessel is detected
- (2) Cooling water leak is detected
- (3) Large light leak is detected

In those cases, the HV power supply for the RICH should be immediately shut off. PHENIX shift crew can do this when personnel authorized for RICH HV operation are not available.

6. Documentation

None