

## Job Hazard Analysis and Mitigation

Task : DIRC PMTs

Routine     Non-routine

**Retention:** Completed Routine JHAMs are retained by the employee and supervisor. Non-routine JHAMs are retained until the task is fully closed out. In the case of an accident, the form is to be retained for use by the review team.

Complete instructions and supporting information is available at <https://www-internal.slac.stanford.edu/esh/SLACsafety/jham/>. Enter information into boxes which will expand to accommodate whatever length of text is entered. Once this JHA is complete, all participants should sign in the Acknowledgement section. Add rows by placing cursor in the right box of the last row and entering a tab.

**This document covers people on non-routine DIRC system work, specifically work on PMTs , like disconnecting the HV from a faulty PMT (“Christmas tree”). Completion of the routine DIRC System Worker JHAM is required.**

Other relevant BABAR safety documents are:

BABAR Care and Feeding Manual (<http://www.slac.stanford.edu/BFROOT/www/Detector/Operations/CareAndFeeding/care/care.html>)

BABAR Safety Assessment Document

BABAR Fire Hazard Analysis

DIRC Area Hazard Analysis (<http://www.slac.stanford.edu/BFROOT/www/Detector/DIRC/DircOperations/Safety.html>)

Sequence of Basic Job Steps	Potential Hazards	Controls & Recommended Actions
<ul style="list-style-type: none"> <li>Worker ramps down HV using EPICS control</li> </ul>	<ul style="list-style-type: none"> <li>Same as in Shifter JHAM</li> </ul>	<ul style="list-style-type: none"> <li>Same as in Shifter JHAM</li> </ul>
<ul style="list-style-type: none"> <li>Worker turns off HV crates using key</li> </ul>	<ul style="list-style-type: none"> <li>If output voltage is not already at zero, disable will cause output voltage to go abruptly to zero, and may damage PMTs. No personnel hazards.</li> </ul>	<ul style="list-style-type: none"> <li>Worker should wait for HV monitor to read zero volts before applying hardware disable.</li> </ul>
<ul style="list-style-type: none"> <li>Worker removes key from HV crate and keeps key on person</li> </ul>		
<ul style="list-style-type: none"> <li>Worker gains access to the PMTs. PMT sectors are located on the backward side of BaBar, and some require access with a ladder or manlift.</li> </ul>	<ul style="list-style-type: none"> <li>Fall from ladder or manlift</li> <li>PMTs may be at HV if the supply is not set to zero volt and disabled.</li> </ul>	<ul style="list-style-type: none"> <li>Use of harness is required.</li> <li>Ensure that steps 1-3 are done</li> <li>Ladder and harness training required</li> <li>IR-2 controlled access training for controlled access</li> </ul>
<ul style="list-style-type: none"> <li>Worker performs the task (i.e. disconnect faulty PMT)</li> </ul>	<ul style="list-style-type: none"> <li>HV cable end remains connected to the HV supply</li> </ul>	<ul style="list-style-type: none"> <li>Isolate the connector end</li> <li>Use of hard hats required</li> </ul>

Sequence of Basic Job Steps	Potential Hazards	Controls & Recommended Actions
	<ul style="list-style-type: none"> <li>Fall-off of hand tools</li> </ul>	
<ul style="list-style-type: none"> <li>After task is completed worker returns key to HV crate and turns on HV crate. Worker ramps up HV in epics</li> </ul>		

<b>Acknowledgements</b>	<b>Print Name</b>	<b>Signature or Initialed</b>	<b>Date</b>
<b>DIRC System/Operations Manager:</b>			
<b>DIRC System Worker:</b>			