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C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

9.2.7.b Design Criteria for Experimental Flammable Gas System Environment

Text Pages 2 through 3

C-A-OPM Procedures in which this Attachment is used.		
9.2.7		

Hand Processed Changes

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Approved: \_\_\_\_\_ ***Signature on File*** \_\_\_\_\_  
 Collider-Accelerator Department Chairman Date

A. Etkin

## **1. FLAMMABLE GAS DETECTION AND ALARMS**

- 1.1 The design of operational systems and indoor storage of flammable gas shall be provided to the ESRC for review. It shall include an appropriate array of point detectors which alarm at the experimental operations control panel(s) and, when deemed necessary, at the Collider alarm panel in the Main Control Room. The ESRC may require certain automatic functions in conjunction with alarm conditions; i.e., start of ventilation fans, electric power crash, etc.
- 1.2 Consideration should also be given to also providing status signals to the PASS.
- 1.3 A minimum of two alarm set points shall be established. An emergency action level set to 25% of the LEL shall cause any pre-established automatic protection functions to actuate. These functions shall be reviewed by the ESRC. The experimental group shall establish a warning level set somewhere below the emergency action level. The basis of the warning level shall be reviewed by the ESRC.

## **2. ENVIRONMENT**

- 2.1 There shall be no combustible materials or ignition sources in or around the device. The layout shall be approved by the ESRC.
- 2.2 A flammable gas burn test shall be conducted on the prototype chamber to determine the area of the burn. The specifications on test conditions shall be approved by the ESRC.
- 2.3 Turn-to-turn short protection shall be provided on any associated spectrometer magnet that is in the vicinity.
- 2.4 If vacuum windows are in close proximity to flammable gas devices they shall be pumped or purged down for 24 hours prior to introduction of flammable gas. These vacuum windows shall be classified and operated as a QA-1 device.
- 2.5 The surrounding power and electronics shall be turned off during routine and emergency purge cycles of flammable gas.

## **3. PROCEDURES**

- 3.1 Detectors with flammable gas volumes greater than 50 ft<sup>3</sup> or flammable gas flow rates greater than 1 ft<sup>3</sup>/hr require trained watch personnel to be present 24 hours/day.
- 3.2 An Operations Procedure shall be provided to the ESRC for approval for the purge/fill and quiescent operation for all chambers containing flammable gas.
- 3.3 The cognizant engineer shall provide alarm response procedures for shift personnel to the ESRC for approval.
- 3.4 Only personnel who are trained on the procedures shall be designated to stand watch on the system.

- 3.5 At a minimum, notifications to the ES&H Coordinator, Main Control Room (if standing watch) and the Fire/Rescue Group shall be a stated requirement in the fill procedures. They shall be made before introduction of flammable gas in the device and after flammable gas is purged for maintenance or extended shutdown.

**4. OPERATIONAL LIMITS**

- 4.1 All flammable gas counters and systems are considered approved for five (5) calendar years after their first run, unless otherwise determined by the ESRC. After this period, they must be re-certified.
- 4.2 A summary document outlining the operational and safety envelope shall be provided for each system.