Special Test Request Form	**STR Number 27X**

Part 1 – Test Definition Section

Test Title: TKR readout redundancy test using the ACD as a trigger	**Test Requestor**: Eduardo do Couto e Silva and Anders. W. Borgland

Test Purpose and Justification:
We want to verify that the TKR readout redundancy (reading out a plane from one side only) does not affect the TKR hit/cluster multuplicity. In the 8 towers and ACD configuration we will take cosmic ray data and trigger on 15 top ACD tiles that shadow the 8 towers in the grid. This will be the only allowed trigger.

By using the ACD as a trigger and – offline - using the CAL to define MIPs we will obtain straight down tracks and we avoid triggering on the TKR when we study the TKR.

We will collect muon data in four different TKR readout configurations (see below). Configurations #2 and #3 stress the data transport a maximum, while configuration #4 puts a maximum of stress on TkrRecon.

1. Collect 2h of muon data in flight configuration. This will be the baseline.
2. Collect 2h of muon data reading out the TKR from the LEFT side only.
3. Collect 2h of muon data reading out the TKR from the RIGHT side
4. Collect 2h of muon data reading out the TKR from LRLRLR .... i.e. Alternating planes are read out from alternating sides.

Test Description:

1. Use the three top rows of ACD tiles that shadow the 8 towers in the grid as a trigger: Tile names 000, 001, 002, 010, 011, 012, 020, 021, 022, 030, 031, 032, 040, 041, 042. This can be done by defining two identical Regions of Interest (ROI) containing the 15 tiles and trigger on the coincidence of the two identical ROI. This is necesssary since the GEM can only trigger on the coincidence between two ROI. We will use the ROI as the only trigger.
2. Assuming a trigger rate of 100 Hz per tile - as given by the ACD people - the trigger rate will be a maximum of 1500 Hz. The main goal of this test is to have tracks in the towers i.e. The ACD thresholds should be chosen for purity i.e. Something like 0.64 of a MIP.
3. Collect 2h of muon data where we read out the TKR from both sides. This is the baseline.
3. Collect 2h of muon data where we read out the TKR from the Left side only.
4. Collect 2h of muon data where we read out the TKR from the Right side only.
5. Collect 2h of muon data where we read out alternating planes in the TKR on alternating sides i.e. LRLRLR....

GSE Configuration:

Current configuration used for 8 tower and ACD data taking under LATTE 4.x

LAT Configuration:

Eight towers in the grid with the ACD, EM GASU and EM PDU.

Expected Results/Acceptance Criteria:

Expected results:

1. Offline analysis of TKR quantities in the different readout modes.
2. Offline verification that the ACD ROI functioned properly as a trigger.

Acceptance criteria: Data taking completes with no errors.

Expected Duration:

10h including setup.

Expected Analysis Duration:

2 weeks

Test Procedure:

Same as any SVAC run with the configurations modified as described above. Each test should be divided into 30 minute runs by the operator.

Test Script:

We will need four test scripts, one for each of the different TKR readout modes.

Part 2 – Impact Assessment Section

Procedure development:
Procedure used for data taking with 8 towers and ACD: No impact.

Script development and checkout:

1. SVAC needs to define the ROI that is used for the trigger. This is done.
2. Online needs to write four scripts for data taking with 8 towers and ACD in flight configuration with the specified ACD ROI set to be the only trigger and with the relevant TKR readout. The first three configurations can be based on the End2End runs B-2, 2-6 and 2-7.

Impact to schedule:

No impact.

Risk Assessment:

Procedure does not have any risk.

Required Resources:

1. Eight towers and ACD in the grid, EM GASU and EM PDU.
2. Presence of an operator to power on and off the instrument at test start and end, run the test script and manually end each run after a predermined length/
3. Please notify Anders W. Borgland when the test starts.

.

Other Affected Parties:

1. SVAC: Needs to define the ROI that shadow the 8 towers. This is done.
2. Online: Needs to write the four test scripts.

Part 3: Signature Approval:

Required Authorizations	Printed Name	Signature	Date
Quality	Joe Cullinan		
I&T	Elliott Bloom		
Program Office	Lowell Klaisner or Dick Horn		
Systems Engineering	Pat Hascall		
Affected S/S managers	N/A		
Instrument Scientist	Steve Ritz or Eduardo do Couto e Silva		
Other	N/A		
Other	N/A		
Other	N/A		

Other	N/A		