

Presentation of the CLIC Experimental Area

Version considered for CDR...

Contributions from

DGS-SC EN-CV EN-MEF GS-SEM PH-CMX F Corsanego M Nonis M Gastal J Osborne A Gaddi N Baddams H Gerwig A Kosmicki A Herve N Siegrist

CLIC Experimental Area -overview



CLIC Experimental Area -overview

Towards an integrated design:

- → Collect input from all actors
 - → Detector community (H Gerwig, A Gaddi, A Herve et al)
 - → Service groups (CV, EL, HE, ASE...)
 - → Safety bodies (RP, SC...)
- → Modify Civil Engineering layout accordingly
- \rightarrow Step 1: Basic requirements for detector
 - → See Talk by A Gaddi presented at MDI on 23/04
- → Step 2: Produce 1st set of 2D CE drawings
 - → See Talk by J Osborne presented at MDI on 07/05
- → Step 3: Collect input from EN-CV on ventilation
 - \rightarrow See Talk by M Nonis presented at CES on 09/05
- → Step 4: Present an updated CE layout and ventilation concept
 - → See Talk given at MDI on 11/06/2010
- \rightarrow Step 5: Present CDR version of the Experimental Area



CLIC- DETECTORS HALL AREA (SURFACE AND UNDERGROUND)











CLIC- DETECTORS HALL AREA (SURFACE AND UNDERGROUND)



CLIC- DETECTORS HALL AREA (SURFACE AND UNDERGROUND)

D









First considerations on Services Installation in the underground facilities



First draft concept for the ventilation system in the CLIC experimental area

FUNCTIONNALITIES ENSURED BY THE VENTILATION:

- \rightarrow Provide fresh air for personnel.
- \rightarrow Treat air according to need: heating, conditioning, dehumidify.
- → Evacuate thermal charges.
- → Ensure dynamic confinement between machine and accessible areas where 100% air tightness cannot be achieved
- → Provide extraction capabilities
- \rightarrow Filtering exhaust air before releasing into the environment.
- \rightarrow Purge of areas (after fire).

Initial assumption to be confirmed by RP:

- \rightarrow The interaction region should be a ventilation sector separated from the caverns
- → Dynamic confinement to be considered



Scheme at CMS



17

First idea:

Use of a ventilation wall in conjunction with inflatable seal and expanding fire proofing sacks (TX54)





First idea:

For CLIC moveable shielding walls, the cavern side of the opening to the transfer tunnel could be equipped similarly





The detector would be moved into beam position on a moving platform The concept could be similar to the PX56 plug (2200 tons)







Since the services should not be disconnected, Cable chains will have to be used.

Sealing off moving cable chains will be challenging Option to study:

→Trenches could be closed in an airtight fashion using appropriate cover plates







Ventilation sectors:

The underground area shall be divided in the following sectors:

- \rightarrow Cavern A
- → Cavern B
- \rightarrow Bypass and interaction region
- → Emergency escape tunnel
- \rightarrow Pressurised areas in shaft (2)





Ventilation sectors:

The underground area shall be divided in the following sectors:

martin.gastal@cern.ch

- → Cavern A
- → Cavern B
- → Bypass and interaction region
- → Emergency escape tunnel
- \rightarrow Pressurised areas in shaft (2)









Ventilation sectors:

The underground area shall be divided in the following sectors

- → Cavern A
- → Cavern B
- → Bypass and interaction region
- → Emergency escape tunnel (2)
- \rightarrow Pressurised area in shaft (2)





For each sector it is foreseen:

→fresh air supply,

- →extraction system,
- →redundant AHUs located on surface,
- →air recycling,
- →ducts via existing shafts

The ventilation system will require a secured power network (UPS, Diesel)

Assumptions for CDR:

Temperature surface buildings

 \rightarrow Summer: T_{Air}= 25deg C +/- 2deg C

 \rightarrow Winter: T_{Air}= 18deg C +/- 2deg C



Cavern Sectors

Power supply Slow dump resistor Breakers Cold box Flexible sc bus-bars Flexible transfer lines

Proposed parameters -Thermal charge 125kW ±50% for each detector (A Gaddi) -T=20°C±1 -H= [40%; 60%] -Dedicated gas extraction for Gas room

Fast dump resistor Dewar

Services at end of Cable Chains Potentially closed

A Gaddi

Summary

→The CDR version of the CLIC Experimental Area has been presented and will be used for the costing exercise

→More modifications are expected as constraints from services groups are consolidated.

 \rightarrow Next steps:

 \rightarrow Come up with a draft shaft cross section including lift, ventilation ducts, elements of detector, staircase, cable trays \rightarrow Come up with a draft layout of surface assembly halls. One idea to

investigate would be to have only one set Heavy Lowering gantry crane/ Plug