CLIC

Compact Linear Collider Study

Meeting Minutes

CLIC CEIS WORKING GROUP

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Participants

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Links to Indico: https://indico.cern.ch/event/642471/

Contents

1 AGENDA

- 09:00 – 09:20: Meeting begins, John Osborne goes through the minutes from the last meeting and introduces the Agenda for the meeting.
- 09:20 – 09:40: Simon Marsh Presented an introduction and recap for CLIC Safety and requirements moving forward.
- 09:40 – 10:10: Matthew Stuart presented an update on CLIC Civil Engineering.
- 10:10 – 10:25: Any other business discussed.
- 10:25 – 11:00 Visit to the CLIC Test Bench Facility.

2 PRESENTATIONS

2.1 INTRODUCTION

John Osborne opened the CLIC CEIS working group Meeting 3 at 09:05.

John Osborne went through the minutes from the last meeting, in particular the actions that had been recorded.

Key points:

- Mauro Nonis is still looking for a Fellow or PJAS student to undertake some of the CV tasks.
- Turnaround radii to be defined by A.Latina
- Safety requirements have been extracted from the CDR, these requirements should be refined and included in a hazard register to be produced by S.Marsh
- The BDS tunnel is to be the same size as the main Linac. tunnel to ensure compatibility with future upgrades.
- Drive beam complex is no longer required for the Klystron design, this is to be removed and the drawings to be updated to show the Klystron surface layout.

2.2 SAFETY INTRODUCTION AND REQUIREMENTS

Simon Marsh presented the safety requirements of the CDR and an updated schedule on how to move forward with safety on the CLIC project, this identified the key responsibilities of each discipline in the hazard register procedure.

Key points:

- A hazard register will be produced for CLIC, however, the population of this register is still to be defined:
    - Overall population of the hazard register to be done by S.Marsh
    - Who will define the hazards and the associated risk within each discipline?
- Guidelines will be required by each discipline on how to proceed, this will allow continuity between all disciplines when reporting hazards.
- For a preliminary hazard register it is recommended to use the FCC hazard list as a starting point as there will many common elements between the two projects.
- It is a recommendation to include safety protection within the design of equipment instead of trying to add safety protection measures at a later date. Self-protecting material is preferred.
- The amount of oil required for the Klystron design is a challenging scenario and a fire suppression system will be required to prevent extreme damage in the event of a fire.
    - Is there the potential to build this suppression system into the modules?
- It is to be noted that there is a change in regulation on the use of halogen cables, this should be considered when designing the electrical services within the tunnel.
- Noise sensitivity within the local area needs to be considered when looking at the location of CLIC surface buildings and shaft locations.

2.3 CIVIL ENGINEERIG UPDATE.

Matthew Stuart presented an update on the Civil Engineering, this included the updated civil drawings and an update on the CLIC-TOT.

Key points:

- It is imperative to understand the requirements for electrical alcoves within the Klystron and Drive beam tunnels, this will have a bearing on the overall cost and design of the Civil engineering structures.
- It is assumed that the same shafts can be used for the klystron design as has been presented for the drive beam design.
    - The shaft requirements will depend on the transportation requirements, at present it is foreseen that the lifts will be adequate to transport machinery into the tunnels. If this is the case the handling opening can be reduced.
    - A list of equipment to be transported down the shafts is essential to understand the minimum requirements for the shaft dimensions, Keith Kershaw has a list of transport requirements from the CDR.

- The shaft layout is to be amended to include lifts either side of a staircase, this is the same as FCC.
- The klystron surface building layout design is to be produced, this will show the same layout as the Drive beam design however the drive beam complex will be removed, this includes:
    - Drive beam building and injector tunnel.
    - Combiner rings one and two and the associated cut and cover tunnels.
- Return beam pipe to be added to the cross-section of the Klystron designs, the same dimensions as that included in the drive beam design.
- For the klystron design, any services that are required for the beam machine need to be identified by the relative discipline and collated by Civil Engineering.
- Access requirements between the two caverns of the klystron design need to be considered, if access is required for safety purposes the Linac will have to be extended to allow for “gaps” for access purposes.

3 SITE VISITS

3.1 CLIC TEST BENCH FACILITY

Walter Wuensch provided a visit to the CLIC Test Bench Facility at CERN:

Key points:

- There is potential for the current modulator tank to change, there may also be changes to the klystron itself as it currently uses a solenoid design. The dimensions of this part of the machine will have a significant bearing on the tunnel layout and cross section.

4 TASKS

Tasks are ordered by completion status, new and ongoing tasks first. Status is one of {New, Ongoing, On hold, Completed, Postponed or Cancelled}.

No.	Description and Comments	Start Date	End Date	Status	Assigned
1	**PJAS or Fellow required to take on Cooling and Ventilation integration – Should be available from the summer.**	31/03/2017		Ongoing	M. Nonis
2	**Tunnel Optimisation Tool – Costing and development study.**	31/03/2017	01/10/2017	Ongoing	M.Stuart/ J.Osborne

3	**Turnaround radii may be inadequate, the correct turnaround layout needs to be determined as this ill influence the Civil layout for the higher energy stages.**	31/03/2017	21/07/2017	Ongoing	A.Latina
4	**Draft Civil layouts to be produced by a CE draftsman – Especially Klystron layout. Draftsman to be confirmed**	31/03/2017	22/12/2017	Completed	P.Serafino & G.Giorgianni
5	**Machine heat load calculations required to enable HVAC system requirements to be determined.**	31/03/2017	16/06/2017	Ongoing	M.Aicheler
6	**List of changes to the Civil engineering layouts since the CDR. This will allow the existing drawings to be edited or new drawings to be produced. Include booster Linac. surface buildings, cross check with CDR**	05/05/2017		Completed	M.Stuart
7	**Safety Requirements to be cross checked with CDR and current design. Potential presentation on the safety needs going forward. Meeting to take place to discuss the requirements and a presentation is to be produced for the next meeting.**	05/05/2017	21/07/2017	Updated	M.Stuart S.Marsh
8	**Cooling and ventilation – Presentation to be produced on the current layout for cooling and ventilation, any foreseen changes and any requirements for moving this forward.**	05/05/2017	25/08/2017	Updated	M.Nonis/ Alejandro Mejica
9	**Klystron low energy stage layout – It is to be decided whether to move forward with a single or double tunnel in principle, a cost analysis of both should be undertaken.**	05/05/2017	16/06/2017	Ongoing	CLIC Team M.Stuart/ J.Osborne
10	**Access requirements during beam operation: it is to be determined when access to the modulators will be required, this will affect the layout and cross section of the tunnel/s. Look at examples from the ILC.**	05/05/2017	16/06/2017	Ongoing	TBC (Raised during C.Rossi presentation)

11	**BDS Layout: Decision to be made on the layout of the BDS tunnel – should this be the same as the main tunnel to allow integration with future upgrades?**	05/05/2017	16/06/2017	Completed	D.schulte
12	**Cost comparison required for reducing the size of the large Klystron building for the first energy stage.**	05/05/2017	31/08/2017	Ongoing	M.Stuart/ J.Osborne
13	**The main beam dump is to be reinvestigated to ensure the dimensions are adequate.**	16/06/2017		New	A.Yamamoto & M.Calviani
14	**Update surface buildings drawings to show new substations.**	16/06/2017	21/07/2017	Completed	P.Serafino & G.Giorgianni
15	**Discuss with Steinar whether or not to initiate informal discussions with the French Power Transmissions System Operator on availability and feasibility of power supply from the existing grid.**	16/06/2017	21/07/2017	New	S.Stapnes & D.Bozzini
16	**Cost analysis of the power supply requirements to be done for 380 GeV stage and for the required upgrades.**	16/06/2017	21/07/2017	New	D.Bozzini & D.Aguglia
17	**Plan layouts of equipment that is to be provided in the 2.5km long drive beam building is to be produced**	16/06/2017	21/07/2017	New	D.Aguglia
18	**A solution for the cooling and/or reduction of the heat loads for the CLIC modules needs to be studied and defined before an appropriate ventilation system can be implemented. This could require reducing the amount of heat load to air or by localised cooling. All options to be considered.**	16/06/2017	TBC	New	M.Nonis, M.Aicheler & D.Schulte
19	**Transport to give an update and presentation on the current crane solutions and provide alternative options due to the unrealistic method of transporting modules up to 25km along a tunnel by crane.**	16/06/2017	21/07/2017	New	I.Ruehl & C.rossi
20	**Klystron Surface building requirements are to be provided to**	16/07/2017	21/07/2017	Completed	D.Schulte & M.Stuart

	Civil Engineering to allow a layout drawing to be produced.				
21	**Services within the Tunnel to be updated in a new cross-section**	16/07/2017	21/07/2017	New	M.Stuart M.Nonis & S.Marsh
22	**Location of the new service Cavern needs to be confirmed.**	16/07/2017	21/07/2017	Completed.	M.Stuart
23	**Hazard Register and procedure guidelines on how to populate the register to be produced by safety**	21/07/2017	25/08/2017	New	S.Marsh
24	**Electrical Alcove requirements are to be defined for the Klystron design, Civil drawings will then be updated to show this.**	21/07/2017	25/08/2017	New	TBC (CLIC Team)
25	**A list of items that are to be transported down the shafts is required for transport design**	21/07/2017	25/08/2017	New	M.Czech
26	**Service requirements for the klystron design to be collated by Civil Engineering.**	21/07/2017	13/10/2017	New	SMB: M.Stuart & R.Fernandez

5 NEWS

No other news.

6 AOB

- A safety contact for ILC should be identified to allow collaboration on safety elements of both CLIC and ILC.

7 PLANNED MEETINGS

This section contains planned meetings.

Title	Date	Location	Convener
CLIC Civil Engineering & Infrastructure Working Group Meeting	25th August 2017	6/2/004	J.Osborne
CLIC Civil Engineering & Infrastructure Working Group Meeting	13th October 2017	6/2/004	J.Osborne
CLIC Civil Engineering & Infrastructure Working Group Meeting	01st December 2017	6/2/004	J.Osborne

7.1 TENTATIVE AGENDA FOR NEXT MEETING: 25TH AUGUST 2017

- Presentation on Cooling and Ventilation, this should include a brief overview of the CDR requirements and proposed solutions to the cooling and extraction of the given CLIC module heat loads – **M.Nonis & A.Mejica**
- Presentation on the CLIC Transport systems. – **I.Ruehl & M.Czech**
- Civil Engineering Update – **M.Stuart**
- ***10:*20 – 10:40:** AOB – Any other business.

Note: Formal agenda to follow once finalised.