

# CLIC

## Compact Linear Collider Study

# Meeting Minutes

## CLIC CEIS WORKING GROUP

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|-----------------------------|-----------------------------------|
| <b>Date and Time:</b>       | 2017-12-01, from 09:00 to 11:00   |
| <b>Place:</b>               | 6/2/004                           |
| <b>Work package/Domain:</b> | CLIC CEIS Working Group Meeting 7 |
| <b>Document status:</b>     | IN WORK                           |
| <b>Type:</b>                | Scheduled Update                  |

### Participants

Akira Yamamoto , Alejandro Mejica , Alex Vamvakas , Alexej Grudiev , Andrea Latina , Carlo Rossi , Daniel Schulte , Davide Aguglia , Davide Bozzini , Dominique Missiaen , Edu Marin , Eliseo Perez-Duenas , Fabio Corsanego , Gerard McMonagle , Helene Mainaud , Ingo Ruehl , John Osborne , Jukka Vainola , Katy Foraz , Konrad Elsener , Lars Strom , Lucia Maricalva Brun , Marco Andreini , Markus Aicheler , Marzia Bernardini , Matthew Stuart , Matti Tiirakari , Mauro Nonis , Michal Czech , Nicolas Bellegarde , Philip Burrows , Raul Fernandez , Roberto Corsini , Sarah Aull , Seppo Uimonen , Simon Baird , Simon Marsh , Steffen Doebert , Steinar Stapnes , Stewart Russ , Walter Wuensch

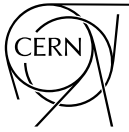
**Links to Indico:** <https://indico.cern.ch/event/650782/>

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## 1 AGENDA

- 09:00 – 09:15: Meeting begins, John Osborne goes through the minutes from the last meeting.
- 09:15 – 09:35: Lucia Maricalva Brun presented an updated schedule for the 380 GeV CLIC CDR Design and Klystron Design.
- 09:35 – 09:50: Alexej Grudiev presented the status and plans for updating CLIC Power output.
- 09:50 – 10:10: Simon Marsh presented an update for the CLIC safety procedure and hazard register
- 10:10 – 10:30: Matthew Stuart presented an update on the Civil Engineering Cost, schedule and TOT.
- 10:30 – 10:45: Akira Yamamoto presented on the uses and advantages of superconducting solenoids in the CLIC Klystron design.

## 2 PRESENTATIONS

### 2.1 INTRODUCTION & ACTION LOG

**John Osborne** opened the CLIC CEIS working group Meeting 6 at 09:05.

John Osborne went through the minutes from the last meeting in particular the outstanding actions.

Key points:

- Andrea Latina is to comment on the drive beam turnaround radii and the possibility for any changes.
- Steinar Stapnes and Daniel Schulte to schedule a meeting with the radiation team to discuss the access requirements for CLIC, input should also be given by those looking into the accessibility requirements for CLIC. **(Accessibility meeting being held on the 21<sup>st</sup> of December)**.
- Roberto Corsini to discuss the drive beam building layout with Steffen Doebert and Gerard McMonagle and provide a layout to Civil Engineering (Note that drive beam building layout could be affected by a change to the Klystron design).
- The main beam dump will remain the same from an infrastructure point of view and therefore this action can be closed for the CEIS working group.

- A fellow is to start on the 01<sup>st</sup> of January to work on CLIC cooling and ventilation studies.
- Michal Czech to work on the underground transport rail system and Matthew Stuart is to send all component information to Michal via email.

## 2.2 SCHEDULE

**Lucia Maricalva Brun** presented an update on the CLIC schedule, this included a new initial schedule for the 380 GeV Drive Beam and 380 GeV Klystron design.

Key points:

- Information is to be provided from CV and Electrical on installation times, the schedule can then be updated using the new rates for CV and Electrical equipment.
- Civil Engineering to look into the surface building construction rates and try and optimise this to reduce the critical path of the schedule.
- The “connection” phase in the schedule should be renamed to “connection and reconfiguration” and more detail should be given to explain what this. (Detail required should just be in the form of text explaining what’s included).
- What if any extension to the drive beam building would be required for the 1.5 TeV phase?
- Solid concrete is to be installed in the klystron design, not a false floor – this would require access to be provided to the underfloor Gallery. The underfloor gallery could be moved to occupy only the space beneath the Klystrons if necessary. (This will require input from CV for the size of services that this gallery is required to contain).
- The Linac side of the tunnel can be lowered if necessary to reduce tunnel width, this would also improve the radiation shielding.
- Individual meetings should be held with each discipline to discuss installation rates etc... An update is to be given at the CLIC workshop in January.
- Start date will be postponed from 2024 to 2026 and are to be changed in future plans.

## 2.3 POWER STATUS & PLANS

**Alexej Grudiev** presented on the status and plans for CLIC Power.

Key points:

- The PBS that is being used for the costing of CLIC should also be used for the CLIC power output.
- Multiple power modes within the PBS would allow one to understand the different power consumptions of CLIC during different modes. Potentially 5 power options for CLIC. Utilising the difference in cost at different times of the year/day can bring operation costs down.
- Look into how much if any deviation from the cost PBS would be required for a power PBS, determine whether or not the same PBS can be used for both.

- The power PBS should differentiate between power to air and power to water.
- It is likely that a power PBS would give an overestimate for the power requirements of CLIC, this is based on evidence for the power estimate of previous machines being overestimated. Can a scaling factor be applied to give a more realistic estimate of the power? Therefore distinguishing between the maximum outputs and the average output.

## 2.4 SAFETY

**Simon Marsh** presented an update on the Safety requirements for CLIC and the hazard register.

Key points:

- Safety register is to use the same overall structure as the cost PBS. Simon Marsh is to speak to those responsible for each node to discuss the hazard register.

## 2.5 CIVIL ENGINEERING

**Matthew Stuart** presented an update on the Civil Engineering cost, schedule and TOT updates.

Key points:

- Civil Engineering will be responsible for editing and inputting numbers into the PBS, this will require good communication with those responsible for any node within the PBS.
- The PBS structure will be updated and complete for the 15<sup>th</sup> of December.
- Civil Engineering are to give an update at the CLIC Workshop in January.
- The schedule for the surface buildings requires a more in depth study and should be provided to the scheduling team once complete.

## 3 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. Interview to take place the week starting the 16/10/2017. | 31/03/2017 | 01/01/2018 | Complete | M. Nonis |

|    |   |                          |                          |                |  |
|----|---|--------------------------|--------------------------|----------------|--|
| 2  | Turnaround radii may be inadequate, the correct turnaround layout needs to be determined as this will influence the Civil layout for the higher energy stages.  | 31/03/2017               | 21/07/2017               | Ongoing        | A.Latina   |
| 3  | Edit: Update of heat loads is a requirement for the entire CLIC team, heat loading from all equipment should be calculated and sent through to <b>M.Nonis</b> . This will allow discussions/meetings to be undertaken and an appropriate solution to be chosen from those presented by <b>M.Nonis</b> .                             | 25/08/2017               | 01/12/2017               | Ongoing        | A.Grudiev  |
| 4  | Access requirements during beam operation in the Klystron design: 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.<br><b>Update:</b> S.Stapnes/D.Schulte to hold a meeting with radiation team and access team. | 05/05/2017<br>01/12/2017 | 01/12/2017<br>22/01/2017 | Ongoing<br>New | S.Doebert &<br>C.Rossi<br><br>S.Stapnes &<br>D.Schulte |
| 5  | 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            | R.Corsini,<br>S.Doebert,<br>G.McMonagle<br>& M,Stuart  |
| 6  | Services within the Tunnel to be updated in a new cross-section   | 16/07/2017               | 21/07/2017               | New            | M.Stuart<br>M.Nonis &<br>S.Marsh                       |
| 7  | Hazard Register and procedure guidelines on how to populate the register to be produced by safety   | 21/07/2017               | 22/01/2017               | Ongoing        | S.Marsh  |
| 8  | Electrical Alcove requirements are to be defined for the Klystron design, Civil drawings will then be updated to show this. This will be defined by the power distribution requirements.  | 21/07/2017               | 25/08/2017               | New            | TBC (CLIC Team)  |
| 9  | Service requirements for the klystron design to be collated by Civil Engineering.   | 21/07/2017               | 13/10/2017               | Ongoing        | SMB: M.Stuart &<br>R.Fernandez                         |
| 10 | Safety: propagation of smoke/gas cloud against escape time from the tunnel to be  | 25/08/2017               | 22/01/2017               | Ongoing        | S.Marsh  |

|    |  |            |            |     |                          |
|----|--|------------|------------|-----|--------------------------|
|    | studied by safety. – Minimum fire design requirements to be provided instead of a full study.  |            |            |     |                          |
| 11 | Transport: Continuously update the list of equipment including dimensions and weights, this is to be sent to transport as soon as available. Produce similar tables for the Klystron design. | 25/08/2017 | 01/12/2017 | New | CLIC Team                |
| 12 | Those responsible for a node in the PBS are to give feedback on the structure to M.Stuart before the 15 <sup>th</sup> of December  | 01/12/2017 | 14/12/2017 | New | PBS Responsible person/s |
| 13 | Study to be undertaken for the Schedule for the surface buildings  | 01/12/2017 | 09/03/2017 | New | M.Stuart                 |
| 14 | Information on Installation rates to be provided for CV and electrical equipment and Marzia t hold meetings with all disciplines that have input into the schedule.                          | 01/12/2017 | 09/03/2017 | New | M.Bernardini             |
| 15 | The PBS is to be reviewed to ensure it is adequate for the power requirements of CLIC.   | 01/12/2017 | 09/03/2017 | New | A.Grudiev                |

#### 4 NEWS

- A CLIC Workshop will be held at CERN from the 22<sup>nd</sup> to the 26<sup>th</sup> of January, each discipline is to give a status update at this workshop.
- Follow this link to sign up >>> [CLIC Workshop Registration](#)

#### 5 AOB

- Presentation to be given by Transport, Civil Engineering, Schedule, Safety and HVAC at the CLIC Workshop.
- Between the 12<sup>th</sup> and the 19<sup>th</sup> of January the presentations for the CLIC workshop should be reviewed.

#### 6 PLANNED MEETINGS

This section contains planned meetings.

| Title | Date | Location | Convener |
|-------|------|----------|----------|
|-------|------|----------|----------|

|   |  |         |           |
|---|--|---------|-----------|
| Placeholder to review the presentations for the CLIC Workshop | 12 <sup>th</sup> January 2018                    | 6/2/004 | J.Osborne |
| CLIC Workshop   | 22 <sup>nd</sup> – 26 <sup>th</sup> January 2018 | CERN    |           |
| CLIC Civil Engineering & Infrastructure Working Group Meeting | 09 <sup>th</sup> March 2018                      | 6/2/004 | J.Osborne |
| CLIC Civil Engineering & Infrastructure Working Group Meeting | 06 <sup>th</sup> April 2018                      | 6/2/004 | J.Osborne |
| CLIC Civil Engineering & Infrastructure Working Group Meeting | 11 <sup>th</sup> May 2018                        | 6/2/004 | J.Osborne |
| CLIC Civil Engineering & Infrastructure Working Group Meeting | 15 <sup>th</sup> June 2018                       | 6/2/004 | J.Osborne |

## 6.1 TENTATIVE AGENDA FOR NEXT MEETING: 08<sup>TH</sup> MARCH 2018

- Update on the HVAC systems – **Pedro Cabral**
- ILC/CLIC Collaboration – **John Osborne**
- Civil Engineering Update – **M.Stuart**
- An update will be given on the CLIC module heat loads. – **Markus Aicheler**

*Note: Formal agenda to follow once finalised.*