ELENA TDR review
Infrastructure
Infrastructure means...
Racks will be installed in:

- **AD hall close to the machine** (2 floors) for those racks needing short cabling
- **AD rack room** for all others
Cabling

- Routing of cables is not defined yet
- Passages will be kept below the shielding blocks surrounding ELENA
- Main power supply will come from switchboards in the AD rack room

<table>
<thead>
<tr>
<th>Designation</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Spare Quantity</th>
<th>Room</th>
<th>Location</th>
<th>Output Voltage / V</th>
<th>Output Current / A</th>
<th>Converter Output Power / W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CERN</td>
<td>CERN_AuxPS_TYPE2</td>
<td>1</td>
<td>193_R-407</td>
<td></td>
<td>450</td>
<td>400</td>
<td>180,000</td>
</tr>
<tr>
<td>2</td>
<td>CERN</td>
<td>COBALT</td>
<td>1</td>
<td>193_R-407</td>
<td></td>
<td>50</td>
<td>200</td>
<td>10,000</td>
</tr>
<tr>
<td>3</td>
<td>CERN</td>
<td>CANCUN_50</td>
<td>5</td>
<td>193_R-407</td>
<td></td>
<td>30</td>
<td>50</td>
<td>1,500</td>
</tr>
<tr>
<td>4</td>
<td>Heinzinger</td>
<td>PTN3p 32-1500</td>
<td>1</td>
<td>193_R-407</td>
<td></td>
<td>32</td>
<td>1,500</td>
<td>48,000</td>
</tr>
<tr>
<td>5</td>
<td>CERN</td>
<td>CANCUN_30</td>
<td>0</td>
<td>-</td>
<td>193</td>
<td>75</td>
<td>20</td>
<td>1,500</td>
</tr>
<tr>
<td>6</td>
<td>FUG</td>
<td>HCE 7 -3500 PAIR</td>
<td>7</td>
<td>193_</td>
<td></td>
<td>7000</td>
<td>0.002</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>FUG</td>
<td>HCE 7 - 1250 PAIR</td>
<td>2</td>
<td>193_</td>
<td></td>
<td>2500</td>
<td>0.0</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>FUG</td>
<td>HCE 7 - 35000 PAIR</td>
<td>2</td>
<td>193_</td>
<td></td>
<td>70000</td>
<td>0.0</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>FUG</td>
<td>HCE 7 - 650 PAIR</td>
<td>8</td>
<td>193_</td>
<td></td>
<td>1300</td>
<td>0.0</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>FUG</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Courtesy: J. Baillie
With the first information given by the users:

- Length estimation of each link,
- Definition of the total quantities for each item.

Cabling activities: Strategy for a new project

- Installation priorities
- Definition of the cabling campaign
- Installation of the cable ladders
- Rack installation
- Cable database preparation
- Worksite preparation

Cable requests (DIC)

- Supply of material
- Calculation of quantities
- Price estimation
- Ordering of material
- Functional Position layout
- Naming of FP (Boxes)
- List of racks per system
- Infrastructure
- Passages Génie Civil
- Size of the cable ladders

Cabling

- Cabling activities

Strategy for a new project

- Courtesy: J.C. Guillaume
ELENA cooling systems

- Cooling in AD hall: air conditioning (lost water) and mixed water (25°C)
- General Policy: more than 3 kw to be dissipated by a system: must be water cooled

<table>
<thead>
<tr>
<th>New users</th>
<th>Location</th>
<th>Cooling power (kW)</th>
<th>$T_{in}$ (°C)</th>
<th>$\Delta T$ (°C)</th>
<th>$\Delta P$ (bar)</th>
<th>Flow (m3/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELENA</td>
<td>6 + 1 dipoles</td>
<td>50</td>
<td>24</td>
<td>15</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>GBAR</td>
<td>electron linac</td>
<td>25</td>
<td>10 to 20</td>
<td>30</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>e+/e- selector</td>
<td>15</td>
<td>24</td>
<td>10</td>
<td>6</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>e+ trap magnet</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>0.5 to 0.8</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>e+ trap duct</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>0.5 to 0.8</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Neon moderator</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>&lt; 1</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Neon re-moderator</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>&lt; 1</td>
<td>0.1</td>
</tr>
<tr>
<td>BASE</td>
<td>B192</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td>SOURCE H+/H-</td>
<td>B193</td>
<td>10</td>
<td>?</td>
<td>?</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>B393</td>
<td>kickers</td>
<td>14.5</td>
<td>?</td>
<td>10</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Power converter</td>
<td>B193-R-407</td>
<td>10</td>
<td>10</td>
<td>24</td>
<td>3.5</td>
<td>0.9</td>
</tr>
</tbody>
</table>

|Courtesy: A. Broche|

Total = 9.5
Cooling distribution principle

Connection to existing distribution

Pipes will be under false floor
New metallic structures (1)

- Rack platform and circulation gangways

Towards AD Control room

Towards bdg 393
New metallic structures (2)

- False floor around ELENA machine

Routing of cables and pipes
Technical bdg 393

- Construction progressing according to schedule
Internal distribution
Offloading area (8x4.6 m²)

Kickers 12.7 x 14.7 m²

Test bench 7 x 10 m²

Porte 5x 6 m²

Cleaning room (5 x 4 m²)

Workshop 5 x 6 m²

ATRAP Storage (6 x 3 m²)

BASE Storage (6 x 3 m²)

CV 6x1.5 m²

Storage (6 x 3 m²)

ALPHA Storage (6 x 3 m²)

ASACUSA Storage (6 x 3 m²)

Storage (6 x 3 m²)

Storage (6 x 3 m²)

Storage (6 x 3 m²)

21900 mm

27050 mm
Mezzanine not financed yet
Will require AD crane upgrade

Kickers 12.7 x 14.7 m²

Gate 6x 6 m²

Gate 2.5x 3 m²

Hook at 6.8 m

21900 mm

27050 mm

3.4 m free height below mezzanine
ELENA components supports

- ELENA component will be supported as much as possible on common aluminium beams
- Specific support feet will be used when required
- Adjustment systems to be adapted

F. Butin / ELENA collaboration
Survey work for ELENA

- SURVEY will, during the whole duration of the project, provide and execute the following tasks for ELENA and its transfer lines:
  - Implement and measure a global geodetic network, starting from the existing one for the AD machine,
  - Mark on the floor every needed position for the beam, the jacks, the girders, and the support posts,
  - Align all magnetic elements within the given tolerances,
  - Give advice for the positioning of the fiducial marks / survey targets on the magnetic elements,
  - Give advice for the construction of the moving tables / jacks,
  - Execute 3D Scans, where needed, for integration purposes.