CNGS - Status of works

presented by

Konrad Elsener, CERN SL Division
CNGS: the main components

700 m  100 m  1000m  67 m

Target Horn  Helium bags  Decay tube  Hadron stop  Muon detectors
Proton beam  Reflector  Pion / Kaon

π/K - decay  Muon Neutrino

vacuum

CNGS - Status of works
NUFACT-WG meeting - presented by K. Elsener (CERN)
Proton beam (1)

New fast extraction system at point 4 of SPS (common with LHC): FIRST TESTS IN 2003
Proton beam (2)

73 deflection (dipole) magnets (6.4 m long) +

21 quadrupole magnets + correction dipoles
+ vacuum + beam observation + ...

prototypes under construction
design phase
Target Box - under design
(5 target units, i.e have spares in-situ)
Target Unit

13 graphite elements, 10 cm long, Ø 4 or 5 mm elements held by C-C “cards”, inside Ti tube
overall target length: 2 metres
**Status: Horn / Reflector**

in-kind contribution from France (IN2P3)

- 7 m length (approx.)
- horn axis height: 1.6 m
- 1 ton (approx.)
- pulsed 150 kA, 1 ms

10 September 2002
Inner conductor

⇒ most difficult part of a magnetic horn under construction at CERN Workshop

- length: 6.65 m
- min. thickness: 1.8 mm
- diameter: 30.8 to 136 mm
- made up of 9 conical parts and 2 flanges
Mechanical stress from electric pulsing:

Experimental results on prototype horn (W. Coosemans, CERN)
Status: Decay Vacuum Tube

Steel tube $\phi = 2.45$ m (6 m long sleeves) welded in-situ;
- buried in concrete

Adjudication: 19 Sept. 2002

Works:
- $\approx$ August 2003 -
- $\approx$ February 2004
Hadron stop (beam dump)

- Exit window
- Decay tube
- Iron blocks
- Concrete wall (300mm thick)
- Graphite blocks
- Cooling system

(R=3m)
♦ Design is ready
♦ Graphite blocks: call for tender
♦ Iron blocks recuperated from WANF

**Installation:** summer 2003

490 iron blocks,
56 graphite blocks,
16 aluminum blocks + ...
CNGS schedule

2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006
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**Civil Engineering**
- excavate civil engineering pit, tunnels and caverns;
- concrete / shotcrete tunnels and caverns

**Install hadron stop**
- iron + graphite blocks, aluminum plate + water cooling

**Install decay tube**
- lower decay tube sleeves, weld together, pour concrete

**Install general services**
- electrical services, ventilation, cooling water, etc.

**Install equipment**
- proton beam line, target, horn+reflector, shielding

**Commissioning**

First beam to Gran Sasso: May 2006
Start excavation Sept 2002

Target Chamber concreting now under way
Accuracy of the decay tunnel (cf. EST-SU):
\[\Delta X = -6 \text{ mm} \quad \Delta Y = +36 \text{ mm} \quad \Delta Z = -4 \text{ mm}\]
...will be corrected at installation of decay tube
SUMMARY

- CNGS Civil Engineering is “on schedule”
- Design of components well advanced, prototypes of magnets, final horns under construction
- First beam in 2006