

Magnet attraction

CERN Director General Herwig Schopper (right) shows the distinguished visitor's book to Swiss President Pierre Aubert (centre) and French Prime Minister Jacques Chirac.

(Photo CERN 038.6.87)

On 4 June, CERN hit the headlines and prime time TV slots again when French Premier Jacques Chirac and Swiss President Pierre Aubert ceremonially installed the first magnet in the 27 kilometre tunnel for the LEP electron-positron collider, less than four years after French President François Mitterrand, with President Aubert, came to CERN for LEP's official ground-breaking.

Away from the hoopla, LEP tunnel piercing is nearing completion, and the remaining civil engineering work is progressing well. A vast programme for the installation of the thousands of LEP magnets will soon get underway to continue where Chirac and Aubert left off.

Multiton elements for 744 straight sections and 1640 pairs of dipole magnets to bend the beams are being put together on the surface, and will be taken by monorail to pithead PM18 for their descent to the tunnel 80 metres below. Here the LEP monorail will take the elements round the ring to their final destination.

The tricky business of placing the heavy magnets to a fraction of a millimetre in the tight confines of the tunnel (3.8 m diameter) will be handled by specially-developed 'Lobster' and 'Crayfish' manipulators.

With the room to manoeuvre underground necessarily limited, certain components are nevertheless being built as long as possible (up to 12 metres) to speed up installation. The crunch comes when 60 000 tons of equipment have

Flanked by LEP Installation Group Leader Gérard Bachy and LEP Project Leader Emilio Picasso on the left and by CERN Director General Herwig Schopper and French Research Minister Jacques Valade on the right, Jacques Chirac and Pierre Aubert manipulate LEP's first magnet into position.

(Photo CERN 068.6.87)



to be lowered into the tunnel and installed. Rotating beams on the gantry cranes at five shafts will upend long units so that they can be eased down the narrow (6.7 x 2 m) shafts.

As the four large areas to house LEP experiments also near completion, work on the four complex detectors pushes forward, with thousands of components from all over the world arriving at CERN for final assembly and installation.

On 2 June, two days before the magnet installation ceremony, the big superconducting coil for the ALEPH experiment arrived at CERN from the French Saclay Laboratory, where it had left three weeks earlier (see page 14).

The superconducting coil for the DELPHI experiment will soon be tested at the Rutherford Appleton Laboratory in the UK.

Preparations for the big machine's electron and positron beams also gather momentum as CERN's 28 GeV 'Proton' Synchrotron, the hub of CERN's unique subnuclear particle supply system, restarted operations after a six-month shutdown and a major face-lift.

LEP's particles, supplied by the LEP Injector Linacs (LIL) via the EPA Electron-Positron Accumulator, will be pre-accelerated in the PS and the 450 GeV SPS Super

'Proton' Synchrotron before being injected into LEP. The PS had its first taste of electrons last year. Work on the positron supply continued during the six-month shutdown of the big machines, and the first positron beam was stored in EPA in April. The next step is to feed positrons into the PS and from there to the SPS (see April issue, page 13).

LEP's next major public exposure should be in spring 1989, when its colliding beams will open up a new domain of physics. Meanwhile, plans to install a second ring in the LEP tunnel, for colliding proton beams, are being pushed forward.

Jacques Chirac — synergies are possible between European and US projects.

(Photo CERN 101.6.87)



Caring about LEP

The ceremonial installation of the first magnet for CERN's LEP electron-positron collider by French Prime Minister Jacques Chirac and Swiss President Pierre Aubert on 4 June reflected their pride in Europe's achievements in particle physics, and the strong motivation to maintain its position.

CERN Director General Herwig Schopper underlined that the electron-positron collider was not the end of the road. 'This is why the new investment agreed by the CERN Member States, which is beginning to take shape as LEP, is worthy of all our care and attention and is of paramount importance for

the future of European research. This is also why it is absolutely vital that this investment be exploited in the long term for all it is worth... Knowing that the LEP tunnel will probably be the last large ring to be excavated in Europe, at least for some considerable time to come, we contrived to optimize LEP's dimensions so as to be able to install a new machine in the same tunnel at some future date.'

After referring to LEP and to the US Superconducting Collider project, Jacques Chirac declared 'synergies are without doubt possible between the two projects'.