

## ‘OK, I’ve finished my job now’

**Emilio Picasso** talks about the early days of the LEP project and the start-up 20 years ago.

On 14 July 1989 beam circulated for the first time in CERN’s Large Electron–Positron (LEP) collider and a month later the experiments saw their first Z particles, created as the particles and antiparticles met at just the right energy. By 20 September the machine was ready for serious physics. It was a period of enormous satisfaction for the teams that had worked together to bring the project to fruition, and especially so for the project leader Emilio Picasso.

Picasso joined CERN as a physicist in 1964. Twenty years later he found himself immersed not just in accelerator design and construction but in project management and civil engineering, as the 27 km tunnel for LEP began to take shape. Appointed project leader in 1980 by the new director-general Herwig Schopper, he was well known in particular for his work on the g-2 experiments at CERN. These had involved a storage ring 40 m in circumference, but LEP was something on an entirely different scale.

This was precisely what made Picasso decide to accept the challenge of being project leader. “Everything that is new is attractive,” he says, an outlook that has guided his career from cosmic-ray studies with balloons, through bubble chambers and g-2. So he set about learning how to run a major project, starting with advice from John Adams who had masterminded the construction of the SPS.

### Moving mountains

His first task was to set up a management board with the best people available: Gérard Bachy on installation; Roy Billinge for the PS; Franco Bonaudi on experimental halls; Giorgio Brianti as head of accelerators; Bas de Raad for the SPS; Andrew Hutton on machine parameters; Henri Laporte for civil engineering; Günther Plass as deputy leader; Hans Peter Reinhard on vacuum; Lorenzo Resegotti for the magnets; and Wolfgang Snell for the RF. Schopper joined in regularly, mainly only to observe. “I was like the conductor of an orchestra,” Picasso recalls. “It was a good team. We all knew each other



*The then director-general, Herwig Schopper (centre), with Henri Laporte (right) in charge of civil engineering, and LEP project leader Emilio Picasso inside a mock-up of the LEP tunnel in 1983.*

well and respected each other.”

Civil engineering was the main aspect of the project in which Picasso had no experience. One of the first important issues concerned the exact siting of the tunnel, which in the initial plans was to pass 12 km under the Jura mountains with some 1000 m of water-bearing limestone above. This allowed the tunnel to avoid the larger communities in France and Switzerland. Laporte advised that this would be a major challenge, so Picasso and Brianti went with him to meet tunnelling expert Giovanni Lombardi, whose advice was “to get out of the Jura or get out of the project”.

One solution was to downsize, but to keep the ring as big as possible Picasso decided to look into moving it away from the mountains, towards the towns. “I had this idea”, he remembers, “I cannot talk to the Jura, but I can talk to the people.” So they talked to the people, setting up regular meetings with the local communes, and by moving the position of the tunnel to pass for only 3.3 km under the Jura, the team was able to reduce the greatest

height above the ring to 200 m, and with it the maximum water pressure.

The final design for LEP was approved in December 1981 and, following a standard public enquiry in France, construction of the tunnel started in 1983. The mountains had not had their final say, however. The part under the Jura had to be blasted because the mixture of rock was not suitable for the tunnelling machines used elsewhere. For the first 2 km all went well and Schopper had commented to that effect, Picasso recalls, but “two days later, the mountain answered”. Water burst into the tunnel, forming an underground river that took six months to eliminate. The smooth planning for construction and installation now became a complex juggling act.

### A momentous start

By June 1987 part of the tunnel was complete and ready for installation, when Jacques Chirac, then French prime minister, visited CERN with Swiss president Pierre Aubert. Asked to arrange an event for the visitors, Picasso proposed that they position the first magnet. Not surprisingly, Chirac asked when the machine would be ready. At the time, there was no definite date, so Picasso decided there and then, answering “14 July 1989 – the 200th anniversary of the storming of the Bastille.” Chirac responded: “Very good.” But Picasso’s colleagues were less impressed: “Is Emilio crazy? How will we be ready?” By July 1988, however, the first sector was completely installed and a test with beam by the LEP operations team led by Steve Myers proved that the machine was indeed well designed. A year later Picasso’s prediction was confirmed, when the first beam went round the ring at 11.00 p.m. on 14 July 1989.

A month later there was great jubilation as the first collisions occurred. “For a long 10 minutes, Steve Myers and I didn’t know whether the beams were colliding or not,” Picasso recalls, “and then Aldo Micheli called: ‘We have the first Z<sup>0</sup>.’ It was a beautiful moment. Steve had done an excellent job – and I thought, OK, I’ve finished my job now.”

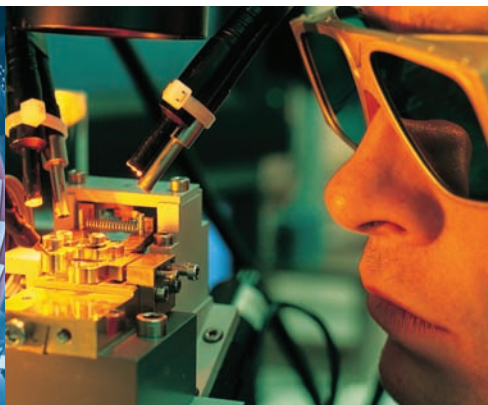
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