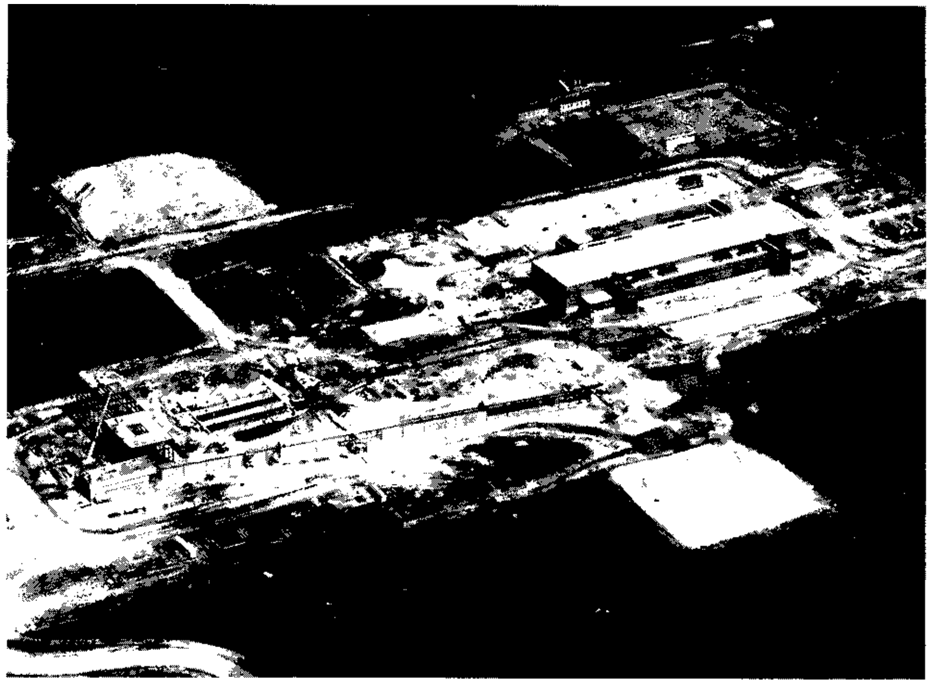
of likely scenarios.

Two working groups on the conceptual design of possible detectors have been set up, one for extracted beams and external targets, headed by Lucien Montanet (e-mail montanet at cernvm.cern.ch) and the other, on internal target possibilities, headed by Claude Amsler (e-mail amsler at cernvm.cern.ch).



Construction at the Ellis County, Texas, site of the Superconducting Supercollider (SSC). Right is the football-pitch size Magnet Development Laboratory (MDL), and at lower left the Accelerator String Test System (ASST, some 200 metres long, and now complete). Under construction alongside are the refrigeration buildings. Nearby, work for the first magnet delivery shaft has now also begun.

SUPERCOLLIDER Texas meeting

With preparations pushing forward for the Superconducting Supercollider (SSC) to be built in Ellis County, Texas, there was a full agenda at the third SSC fall conference, held in Corpus Christi, Texas, from 14-17 October.

Participants heard that civil construction is progressing at the N15 area, with staff and equipment already moving into the Magnet Development Laboratory. The Accelerator System String Test (ASST) building was completed in October, and installation of refrigeration equipment has now begun. The ASST will be used for system testing of a string of full-length 50-mm collider dipole magnets, now being assembled by industry using facilities at Fermilab and Brookhaven.

On the machine side, the design of the accelerator complex continues to be refined, with the low-, medium- and high energy boosters better optimized. Soviet accelerator physicists working at the SSC Laboratory have contributed to this work.

An SSC site development plan, drawn up by the architectural and engineering contractor, covers technical facilities and lays out buildings, roads, utilities and other services for the east and west complexes. A zoning plan for Ellis County is being prepared by an independent contractor. The first campus building contracts are expected to be awarded by the end of the year, and 'pioneers' should start moving onto the campus during 1994.

On the experimental side, the first major proposal - the Solenoidal Detector Collaboration (SDC) - has selected scintillating tiles with wavelength-shifting fibre readout for its central calorimeter. The tracking radius has been fixed at 1.7m, while the number of layers of silicon and other trackers has been reduced to lower costs and reduce thickness of material near the interaction point.

The second major detector candidate - the Gammas, Electrons and Muons (GEM) collaboration - involved 300 physicists from nine countries as of October, and was growing rapidly. Detector technology options were being selected - for the electromagnetic calorimeter, barium fluoride and an accordion geometry liquid argon or krypton were being studied. The magnet is planned as a large (17m diameter x 30m long) unshielded superconducting solenoid.

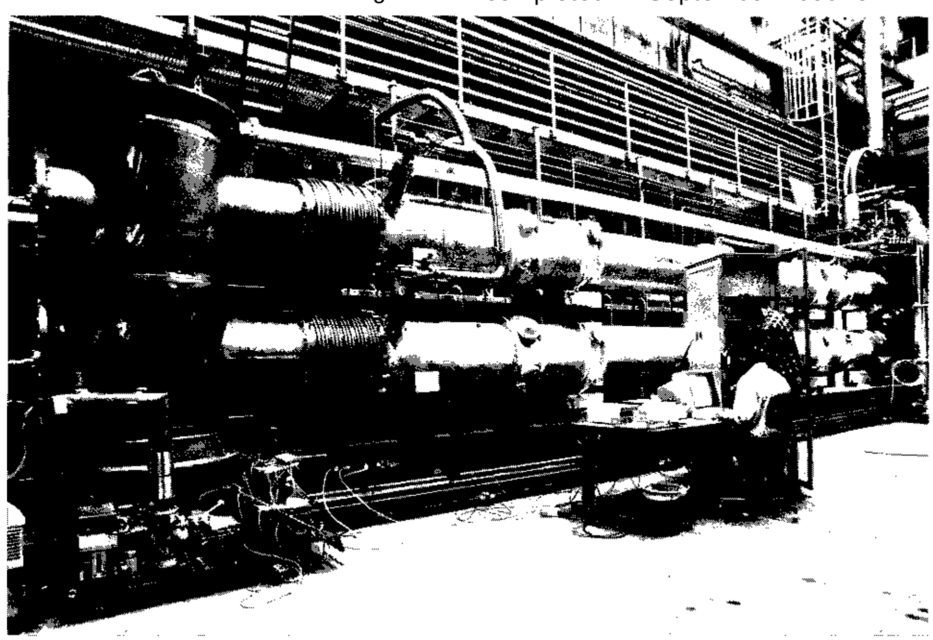
A full day of the Corpus Christi meeting was devoted to detector research and development, with talks on calorimetry, tracking, electronics, muon systems, and computing.

Meanwhile magnets are being built at the SSC Laboratory, and the first SSCL-built magnet has been assembled and successfully tested. This short 50-mm-aperture dipole went to 'short sample' (the superconductor current limit, about 7500 amperes at 4.35 K) on the first quench when testing began at Fermilab in October, and has continued to perform consistently.

The first prototype 'spool piece' has been sent to Fermilab as part of the 40-mm magnet test programme (December 1991, page 6). Each half-cell of the collider lattice will include a spool piece to provide the interface between the magnets and the outside world of electrical power, liquid helium, and control systems. A spool piece contains superconductors and hence must operate at liquid helium temperatures like the dipoles and quadrupoles.

The first magnet delivery shaft is under construction. T.L. James and Co, of Kenner, Louisiana, have begun excavation of a 60 by 30 foot elliptical shaft, 250 feet deep. Two 75-foot-long horizontal tunnels leading from the base of the shaft will be provided to serve as 'starter' tunnels for excavating the main tunnel. Using the shaft and stub tunnels, a subsequent subcontractor will lower and assemble a tunnel boring machine and drive the first section of tunnel northward for 2.7 miles. The shaft, to be completed by mid-1992, will later be used for delivering magnets to the tunnel; its 60-foot dimension will allow them to be lowered in a horizontal position.

Meanwhile the first two full length 50 mm collider dipoles have been tested successfully at Fermilab and Brookhaven. Both went well above the design current of 6500 amperes and performed well. These are the first of a series of dipoles being built at the two Laboratories to transfer the magnet technology to industry. General Dynamics will now build seven dipoles at Fermilab, and Westinghouse will build five at Brookhaven. Of these first dozen industrially assembled magnets, five will be used in the string test next fall at the SSC Laboratory.



Potentially troublesome persistent currents in the superconducting magnets of the proton ring for the HERA electron-proton collider at DESY, Hamburg, are constantly monitored by these two superconducting reference magnets switched into the main magnet circuit. Although the effects are quite strong, they are sufficiently reproducible that field errors can be corrected.

Photo P. Waloschek

DESY
HERA commissioning

The commissioning of the world's first electron-proton collider - the 6.3 kilometre HERA ring at the DESY Laboratory in Hamburg - last year was the result of more than a decade of careful planning, design and construction.

Although 1991 will be remembered as HERA commissioning year, trials began back in August 1988 when 7 GeV electrons were injected into the electron ring. Just three days later, electrons were being held for 20 minutes.

This initial success was followed by a six-week study which confirmed that the electron machine behaved as expected. Commissioning continued eleven months later, and by the end of September the following year, the electron energy had climbed to 27.5 GeV, limited at the time by the radiofrequency power available from the 84 conventional accelerating cavities. Beam optics and multiturn injection were well understood and completely under control. The maximum single bunch electron current of 2.5mA achieved so far is almost a factor of ten above the design value.

A powerful bunch-to-bunch damper system is needed to control the instabilities which develop if the design intensity is stored in 200 bunches. Such a damper system implemented in the downstream PETRA ring enabled design intensity to be reached in this machine. The same system was then built for HERA where its damping capability has been successfully demonstrated.

With the installation of 12 superconducting four-cell cavities the ring is now fully equipped with r.f. power, and last July HERA-e reached its design energy of 30 GeV.

A laser polarimeter to measure transverse spin polarization was tested last summer, and on 20 November, an 8 per cent transverse spin polarization was picked up.

For the proton ring, equipped with superconducting magnets and completed in September 1990 for