

VLT Contracts

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The 8.2-metre Mirrors

Last year, ESO awarded the contracts for manufacture of the 8.2-metre blanks to Schott Glaswerke AG in Mainz and for their polishing to R.E.O.S.C. in Paris, respectively (cf. *Messenger* 53, p. 2 and 57, p. 34.)

At Schott, each of the three annealing/ceramizing ovens was filled with a meniscus blank. On November 12 one blank came out after completion of the annealing and was transported onto a CNC machine for machining to the desired meniscus shape. This activity was followed immediately by the next cast.

At REOSC the new building reached the roofing stage in October (Fig. 1). In December the installation of the INNSE turntable and SOCOFRAM computer-controlled polisher will start. It is expected that the new 8-m polishing factory will be ready for the first tests on the 8-m dummy in April 1992.

The Main Structure

On September 24, another major VLT contract was signed with the "AES Consortium" of three Italian companies during a small ceremony at the ESO Headquarters in Garching. It concerns the construction of the main mechanical structures of the four 8-m VLT unit telescopes, each of which will weigh more than 440 tons and yet must be machined with sub-micron precision in order to allow astronomical observations of the highest quality.

The Consortium partners are: *Ansaldo Componenti* (of the IRI Finmeccanica Group, leader of the Consortium and active in the field of energy generation components, located in Genova), *EIE* (European Industrial Engineering, in the field of engineering design, in Mestre) and *SOIMI* (Società Impianti Industriali, member of the Asea-Brown Boveri (ABB) Group, an integrated multi-service organization specialized in construction and maintenance of industrial plants, in Milan).

The contract was signed by Messrs. Ferruccio Bressani (Director General of Ansaldo Componenti), Gianpietro Marchiori (Member of the Board of EIE) and Luigi Giuffrida (Managing Director of SOIMI) on behalf of the Consortium, and by Professor Harry van der Laan, Director General of ESO.

It includes the design, manufacture, pre-erection and thorough testing in Europe of the four VLT unit telescope

structures, as well as the subsequent dismantling, packing and transport to the VLT Observatory at Paranal. The contract also covers the erection and final testing at Paranal.

The items to be supplied by the contractors include all of the steel structures which will carry the optical mirror cells and astronomical instruments; advanced hydrostatic bearings on which these heavy structures will rest; direct drive motors with 9-metre diameter which will move the telescopes (the design of these motors is based on an axial, dual air-gap configuration and they will be some of the biggest ever built), and high-precision encoders that will measure the exact position of the telescopes, so that they can be correctly and accurately pointed. A schematic drawing of one of the four VLT unit telescopes with all of these components is shown in Figure 2.

This contract requires very high engineering quality with respect to technical reliability, safety and lifetime in order to guarantee the planned performance of the VLT and to fully satisfy the high expectations of European astronomers in the scientific capabilities of their future giant telescope. For this reason, the Italian firms have decided to pool their extensive resources and experience. EIE and Ansaldo Componenti have made important contributions to the constructions of the ESO 3.5-m New Technology Telescope, including the

construction of the octagonal, rotating building and the mirror cell with actuators for the computer-controlled, active-optics NTT mirror. EIE was also involved in studies of the VLT domes. Another Italian Consortium, formed by Ansaldo Componenti (leader), CRIV and INNSE, constructs the 3.5-m Galileo Telescope for Italy, a twin of the ESO NTT.

The construction of the VLT main structures will start within a few months and the parts for the first of the four 8-m telescopes will be delivered to Paranal in late 1994. The erection and testing will be ready in September 1995, whereafter the giant mirrors, which are made in Germany and polished in France, will be installed. The other three telescopes will then follow in one-year intervals, so that the entire VLT complex can be ready in 1998, just over ten years after the decision by the Council of ESO to build the world's largest optical telescope.

Next Contracts

The years 1991 and 1992 represent the culmination of the VLT planning period. During the next 12 months, another dozen VLT contracts will be awarded after the normal tendering procedure has led to the identification of the best suppliers.

Among these contracts are the M1/M3 units, the M2 units, M2 and M3 mirrors, the VLT enclosures, the civil



Figure 1: The REOSC building at the new site in Saint-Pierre du Perray. In the foreground is the 10-m entrance door, in the background the tower for the interferometry tests. (Architect: AITEC, Construction company: IPAC).