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REPORT ON MY VISIT TO SACLAY

On the 8th and 9th September 1959, I visited the Centre d'Etude Nucléaire at Saclay to hear about the organisation of the Saturne machine group and their running experiences, and to learn about target arrangements.

I. General Organisation.

Next year the "Département Saturne" (director M. Maillet) will comprise about 20 engineers, 50 technicians and 20 mechanics and handymen to cope with the running (then 3 shifts, 5 days) and the development of their machine. (In addition there exists inside the division a group building a 80 cm hydrogen bubble chamber).

The Saturne division is subdivided into 2 groups, called S.E.F.S. (section chargée de l'entretien et du fonctionnement de Saturne; leader M. Levy-Mandel) and C.E.D.A.P. (groupe de conduite, entretien, développement des appareils de physique; leader M. Stickel).

S.E.F.S. consists of 4 sections with the following respective responsibilities.

1. Van der Graaf, injection optics, beam observation, vacuum (section leader Mr. Vienet).
2. R.F. and main control room, including operating the main desk (leader Mr. Gouttefangeas).
3. Magnet power supplies and cooling, master timer, controls (leader Mr. Segalas).
4. All mechanical tasks (leader Mr. Remeur).

C.E.D.A.P. is no longer subdivided in order to facilitate the shifting of personnel from one of its various activities to another one. Their responsibilities include beam transport (complete with power supplies and cooling), floating wire measurements, shielding, running of the H<sub>2</sub> liquifier plant (500 l/day from February 1960 onwards) and of the film developing machines, (the bigger one has a capacity of 360 m/h, takes 35, 50, 60 or 70 mm film perforated or unperforated), and supervision of the construction of special buildings such as that for the hydrogen bubble chambers.

As to the running of the machine, the established policy is to work with part-time operators who are capable of repairing common faults. Having set out with about 50 o/o operation time, the tendency is now to reduce this fraction with the aim of enabling a given operator to devote 60 o/o to 70 o/o of his time to repair and development work.

In this development work the Saturne machine group is mainly assisted by 2 other groups:

1. P.A. (physique appliquée, director Mr. Winter)
2. S.P.C.H.E. (service de physique corpusculaire aux Hautes Energies, director Mr. Berthelot).

P.A. is the new name for the division that built Saturne. Its present activities correspond, very broadly speaking, to those of the P.S. research and magnet groups (excluding the propane chamber activities of the latter). In particular P.A. carry on development work aiming at improving the characteristics of the Saturne magnet and they are developing the target moving mechanisms and the slow ejection scheme.

S.P.C.H.E. have developed beam transport magnets and lenses and they design the targets proper and help locating them inside the machine. Also they are fixing the parameters of a velocity separator (along the lines of the Berkeley parallel plates one) to be built by C.E.D.A.P., and lately they started thinking about a fast ejection scheme.

## II. Experiences with machine operation.

There have been no major breakdowns or accidents so far. Some trouble was experienced with the magnet power supply (flash-overs, lubrication of main bearings) but this is overcome now.

The running schedule is still the same as described in C.E.A. no 277 (report on the Saturne operation during the first quarter of 1959). The figures for the last 6 weeks (thought to be representative) are as follows

beam available	270 h
warning up	100 h
time lost due to machine faults	62 h
" " " to outside causes	22 h
maintenance	<u>26 h</u>
	480 h

Twenty-two hours additional maintenance were done outside the 16 h - 5 day schedule.

The general impression obtained is that of a very happy co-operation between the various groups mentioned. This co-operation is probably facilitated by the fact that practically all people stay on the premises all day long (in view of the geographical location of Saclay). I understand that it is not uncommon to invite people to have lunch together rather than calling a meeting.

### III. Targets.

After some experimenting with a purely mechanical target moving mechanism one has now settled for a hydraulic (i.e. oil driven) one. It has been designed to transport a target of 1 kg weight over 200 mm in about 200 msec. The existing prototypes have worked about 300'000 times and a finalised type (with a working pressure of 30 kg/cm<sup>2</sup>) has been ordered from a commercial firm.

The same firm has developed (and delivered to Saclay) the drive for the 300 kg magnet of the slow ejection scheme (described in CEA note 1081). It is a servo-assisted hydraulic mechanism that displaces the magnet horizontally by 200 mm in 150 msec. The working oil pressure is 150 kg/cm<sup>2</sup>. All the parts for the ejection scheme have been delivered and are now being tested and assembled.

A central compressor complete with storage vessel provides all the necessary oil pressures for these as well as other hydraulic drives.

The timing of the targets and the ejection is controlled by special counting units, preset according to experimental needs. There exist 40 of these units (for all timing tasks) and 20 more are on order for ejection etc.

Documents available: Drawings of drives, report on target tests.

K.H. Reich

Distribution: (closed)

M.O.C. members	B. Kuiper
Parameter Committee	G. Plass
H. Horisberger	B. de Raad
F. Krienen	R. Resegotti

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