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Draft proposal for discussion by M.O.C.

A way of organising the commissioning of the C.P.S.

The general nature of this proposal was discussed by R.I.C. on 19.1.1959, and some parts modified accordingly.

1. General.

It is suggested that during the process of commissioning the C.P.S. there should, at any moment, be two men physically present and supervising the work.

One may be called the engineer-in-charge (E.I.C.) whose main duty is to operate the machine. He will be one of the future section leaders of the Machine Group.

The other could perhaps be called X (for want of a good descriptive name), who is supposed to be making some progress in commissioning the machine.

An individual would probably do one of these jobs for a period ranging from about 1 day to a week. The particular individuals chosen at a particular time (especially in the case of X) would depend on the nature of the work to be done at that time.

2. Staff.

It is suggested that the rota of men for X, and the work that they should do (this can only be planned in advance in rather general terms) should be discussed and decided by the fortnightly R.I.C. meeting, with the possibility that the Parameter meeting or the Division Director can alter it if the situation changes between R.I.C. meetings.

It is suggested that the rota of men for E.I.C. should be discussed and agreed by the Machine Operating Committee. (To a good approximation this Committee consists of the men from whom E.I.C. is to be chosen). X would sometimes be another member of this committee, sometimes not. Depending on what aspect of commissioning the machine is being worked on at the time, one can imagine that almost any of the engineers and physicists in the division might be the appropriate X for that time. A few examples are given, by way of illustration, further on.

3. Responsibilities of E.I.C.

(a) To operate the whole machine in the regime required for the work of X.

(b) Safety of personnel, especially in the ring.

(c) To make the adjustments to the controls of the machine required to keep it running.

(d) To make adjustments to the controls of the machine as required by X.

(e) Safety of the machine.

(f) Supervise the operators in the other control centres and give them the necessary instructions for all the above.

(g) Make records of the running-time, running conditions, behaviour and faults of the machine.

(h) To report to the Machine Committee on the work done.

It should be emphasized that the responsibility of E.I.C. with regards to safety is limited to carrying out the work as it has been discussed and decided in the M.O.C. The M.O.C. members take, for their group leaders, the responsibility for the appropriate parts of the machine, including safety.

4. Responsibilities of X.

(a) To make the tests or measurements etc. which have (in a broad and general way) been decided by the R.I.C.

(b) To tell E.I.C. how the machine should be operated and adjusted for the above purpose.

(c) To make records of the results obtained or measurements made.

(d) To report to the R.I.C.

5. The relationship between E.I.C. and X is fairly clear from these lists of responsibilities, but there are two further points worth mentioning.

(a) X must contact the M.O.C. in order to get agreement on a programme, (for the day or a few days) for the work. This would be within the framework of some general Division policy about hours of work, shifts, and availability of operators in the other control centres. The M.O.C. discusses the proposed programme in detail and puts it, when agreed, on paper.

(b) E.I.C. does with the machine whatever is asked by X inside the programme of operation discussed and agreed by the M.O.C. His responsibility for safety of personnel and the machine makes it his duty to refuse to do anything unsafe; and he should have some regard to the long-term behaviour of the machine, and refuse, for example, to disturb some machine adjustment if he knows that it has taken a lot of work to get it set up correctly. He cannot be expected to make quick decisions (on his own knowledge and responsibility) on such questions, so all such questions that are likely to arise in connection with a particular job should be discussed at the meeting between M.O.C. and X, and thereafter E.I.C. will be instructed to refuse to X any alteration in the programme before it has been discussed in the M.O.C.

6. The relationship between E.I.C. and operators in the other control centres.

(a) E.I.C. should know what men are available for operating the other control centres, and would arrange that they are there when required and do the necessary switching-on and warming-up so that all necessary machine parts are either working or available at the time when the running is planned to begin.

(b) Since the major fraction of machine adjustments or changes of regime are executed in the other control centres, E.I.C. has the job of telling the other operators what to do.

(c) In general, the other operators are under the orders of E.I.C. But (in a similar way to 5(b)) they have certain duties to refuse to do unsafe or unreasonable things. In this respect they should regard themselves as working under certain permanent orders laid down by their Group Leaders.

7. Examples.

The sort of way this system would operate can be illustrated by giving a few examples of how one might tackle certain jobs which might arise. It is convenient to put individual names into these examples, just to illustrate the type of man who would be suitable in the various circumstances, but the whole function of these examples should be taken as illustration only. We take a fairly advanced case first:

(a) Work: First tests with beam of beam-control acceleration.

E.I.C. = Georgijevic
X = Schnell

E.I.C. would be in the main control room, would supervise the switching-on and warming-up of the various machine parts by their operators, and at an agreed time would have everything working in a state ready for X to begin. Since the work of X is on the R.F. system, and X is an R.F.-group man, E.I.C. would not have much to do with R.F. in this case, but would leave it to X. However, if the machine has reached this phase of commissioning, E.I.C. and his operators (including R.F. specialists in the central building etc.) should be perfectly capable of getting the machine going

with beam accelerated by programmed R.F., and keeping it peoperly in this state, so that X does not need to look after anything that he is not interested in. On demand from X, E.I.C. would arrange to inject more beam or less beam, etc.

For such a piece of work there might be advantages in having say Fischer as E.I.C., since he is an R.F. man. But there are also advantages in having Fischer free of all the safety and similar duties of E.I.C., so that he could help in the central building to make sure that the basic parts of the R.F. system are functioning as they should.

b) Work: Basic tests of magnet pulse (V, I, B as functions of time).

E.I.C. = Bonaudi
X = Nilsson

This is a much earlier example than (a) above. The only main machine parts required are the magnet, magnet power supply, and magnet cooling system. The main reason for having an E.I.C. (rather than letting X and the power-house operator do the job alone) is that somebody must be responsible for safety. In fact he also has a little to do under the other heading of 3: it would be from him that the other operators hear that they are not required to perform, but that they can do whatever seems useful in the way of running or adjusting or modifying subject to safety requirements and the fact that they must be ready to run again at the next time or date on the programme.

c) Work: Measurement and eventual improvement of noise and interference in beam observation system.

E.I.C. = Brianti
X = Gabillard.

If this is being done without an accelerated proton beam it is (like (b) above) a case where the C.P.S. is not really being run as a whole machine. But X may wish to have all sorts of different parts of the Linac, R.F., Power Supply etc. turned on and off and up and down in order to locate or investigate different sources of noise etc. It seems desirable to have an E.I.C. to arrange this, and watch the safety situation, while X concentrates on making his measurements and asking for the conditions he wants.

8. Time-filling.

This is a further duty of E.I.C. which may be quite important in getting the machine commissioned as quickly as possible. One must expect it to be relatively common that the work on the programme cannot be done: either Mr. X has some trouble with his own specialised equipment, or a part of the machine (essential to what X is supposed to do) has a temporary failure. It is then for E.I.C. to make the best possible use of the time available. It may be that the next piece of commissioning work on the programme

is something that can be done at short notice, and with the facilities available. Another way of using such time profitably is to have a list of relatively low-priority jobs that individual groups would like to do, and of jobs that can be done without Linac, or without R.F., or without vacuum, etc. As one example, take the case that the beam-control tests of 7(a) above are on the programme and the linac fails. E.I.C. looks on his list and finds that the R.F. people have a low-priority desire to repeat some checks on the R.F. frequency programme at different rates of rise. This involves most things apart from the Linac, so is a profitable use of the situation; E.I.C. should go ahead and get it done.

This sort of thing obviously needs further discussion, as it may be difficult to have a proper allocation of responsabilities for the case where some work is begun at short notice.

9. Starting date.

It is not necessary to begin operating the above scheme when individual groups are testing and commissioning their own parts of the machine, except in the cases where safety considerations require it. It seems that there would be the second half of commissioning the magnet, when the magnet is being pulsed at appreciable power, which would need such a scheme on grounds of safety. And most of the commissioning of inflector equipment would involve a radiation hazard in the ring and so require an E.I.C. These phases may very likely overlap: during them the E.I.C. would have very little to do outside the safety field. There would be a phase of injection studies in which R.F. would not be required and would remain more or less outside the scheme.

The result seems to be that if any two or more of the main parts of the machine are supposed to be working together, or if there is any safety hazard in the ring, then one needs an E.I.C. either to be in charge of safety or to organise and coordinate the work or to do both.

Distribution: (closed)

M.O.C. members

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