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0650

SIGNIFICANT FEATURES OF POWER AND COOLING SYSTEM CONSIDERATIONS FOR EXPERIMENTAL AREA SECONDARY BEAMS

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1. From ~~Lamination~~ Summary for Electrical Power Requirements

   4 Years After Turn

   Total Exp. Area Magnets = 205
   "Assigned" to M.R. Exp. Areas = 164

   41 are in injector exp. area, development area or in reserve

   "Assigned" magnets (164) represent 64 MW nameplate rating

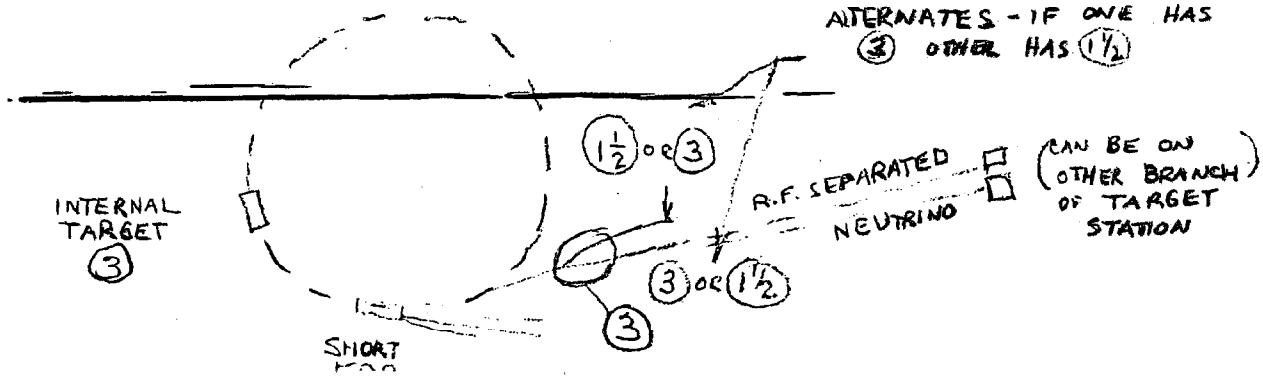
2. Meuser's Recap of July 22, 1966

	Peak Power	Average Power
R. F. Separated Beam	8.0 MW	5.6 MW
Neutrino Beam	6.0	4.2
164 Misc. Secondary Beam Magnets		
Average Power =		18.5
Peak or "Demand" Power = .6 x 64 =	38.3	
TOTALS	52.3 MW	28.3 MW

In discussions in October, in comparison with Bevatron and BNL experience, it was decided a cooling plant of 55 MW including power supplies was adequate (Meeting Notes Oct. 13, 1966).

It remained to determine the proportion of fixed to portable cooling making up the 55 MW.

MAXIMUM NUMBER OF EXPERIMENTAL BEAMS AT VARIOUS TARGET STATIONS



Setup Criteria

a) 11-1/2 beam lines of 14 magnets each will be formed from 164 experimental area magnets.

b) From additional magnets 2 long beams (rf and neutrino) of power shown will also exist.

c) At any given time 8 of these 13-1/2 beam lines will be operating in any combination not to exceed the total number per station shown in the sketch.

d) To accommodate fairly severe load conditions it was agreed that the maximum operating conditions at any given 1-1/2 or 3 beam stations should be:

1) One beam line operating at 100% rating = 5.5 MW
2) 2 other lines at "demand" rating = 2x.6x5.5 = 6.6 MW

An Example of Maximum Usage

Beams			
	1. 2 long beams operating		
2	a) One at peak power (rf separated)	8.0	MW
	b) One at average utilization	5.6	MW
	2. Long EPB		
1-1/2	a) Left outboard station $5.5 + \frac{3.3}{2}$	7.15	MW
3	b) Right outboard station $5.5 + 2(3.3)$	12.1	MW
1-1/2	c) Inboard target station $5.5 + \frac{3.3}{2}$	7.15	MW
8 Beams (of 13-1/2)	TOTAL for 8 Beam Lines	40.0	MW

Since 55 MW is available, 15 MW of cooling are still available to check out the 5-1/2 beams in standby and setup, etc.

i.e., if criterion d) is used the 8 beam lines in service will never use all of the 55 MW of cooling.

NOTE ALSO--These assumptions apply to a time 4 years after turn on. Lambertson estimated approximately 2/3 of the magnets would be available at turn on. Therefore, initial cooling capacity (i.e. Initial construction) should be somewhat in proportion.