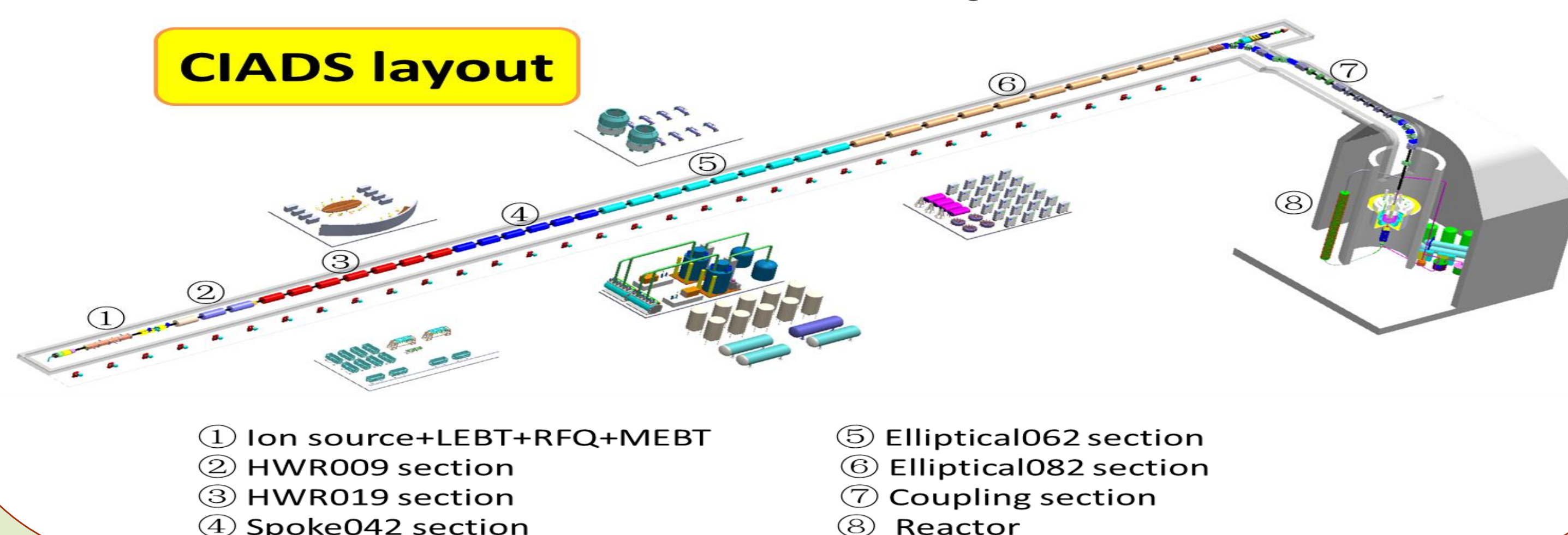


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Introduction

The Accelerator of CIADS (China Initiative Accelerator Driven System) will be built in the nearly future at IMP in china. All the superconducting cavities will be running at 2K. A helium cryogenic system has been designed according to the requirements of the CIADS Accelerator. Total heat load of the cryogenic system is about 3kW at 2K, 1.6kW at 4.5K and 5.8kW at 60K . And the total 4.5K cooling power is 12.84kW. A 15kW/4.5K helium refrigerator is needed.



Cryogenic system design

Requirements

- Cooling mode: **Bath-cooled**
- Running temperature : **2K**
- Running pressure in cryomodule: **31.7mbara**
- Pressure stability in cryomodule : **±0.1mbar**
- Liquid level stability in cryomodule: **±1%**

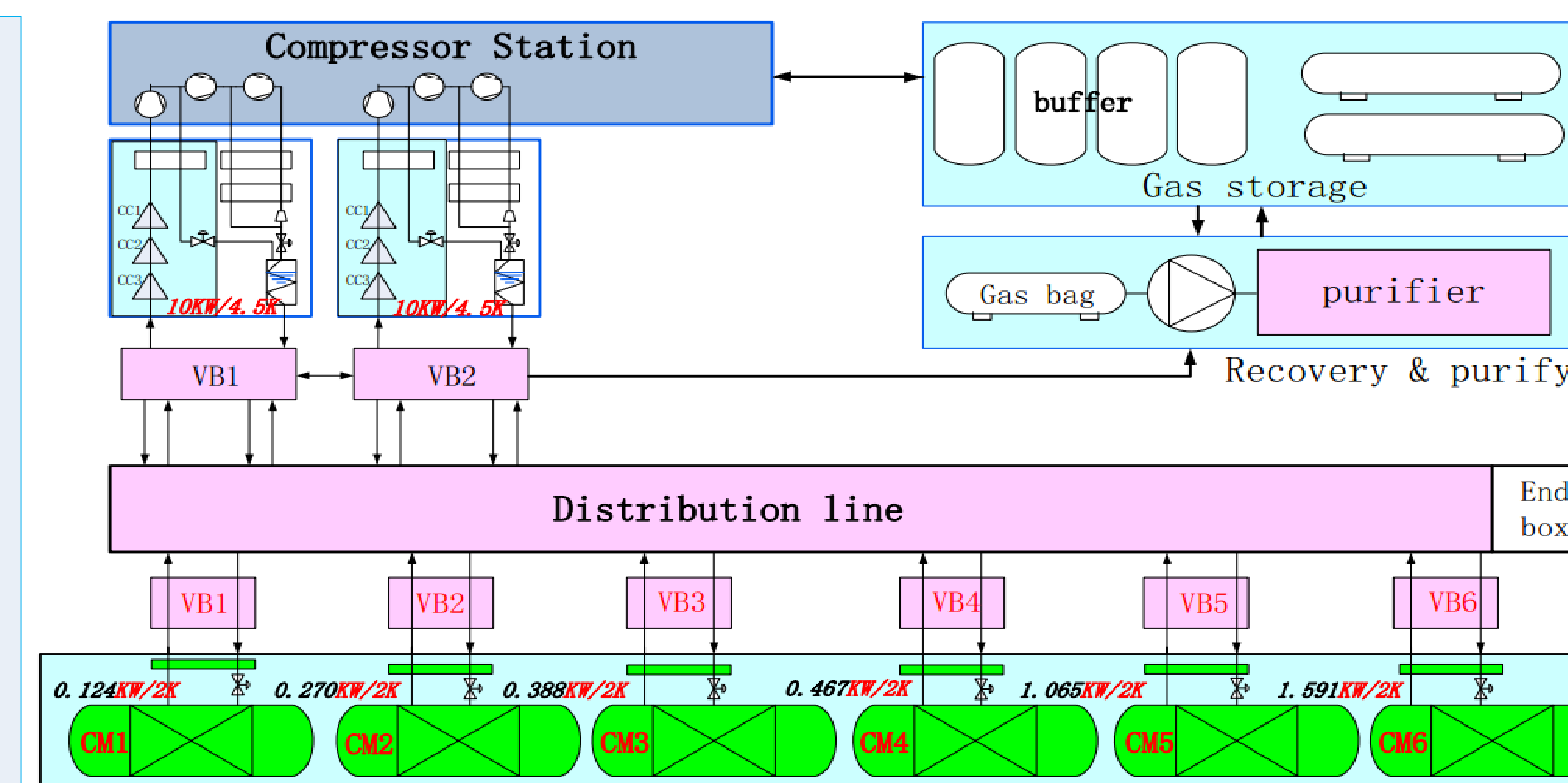
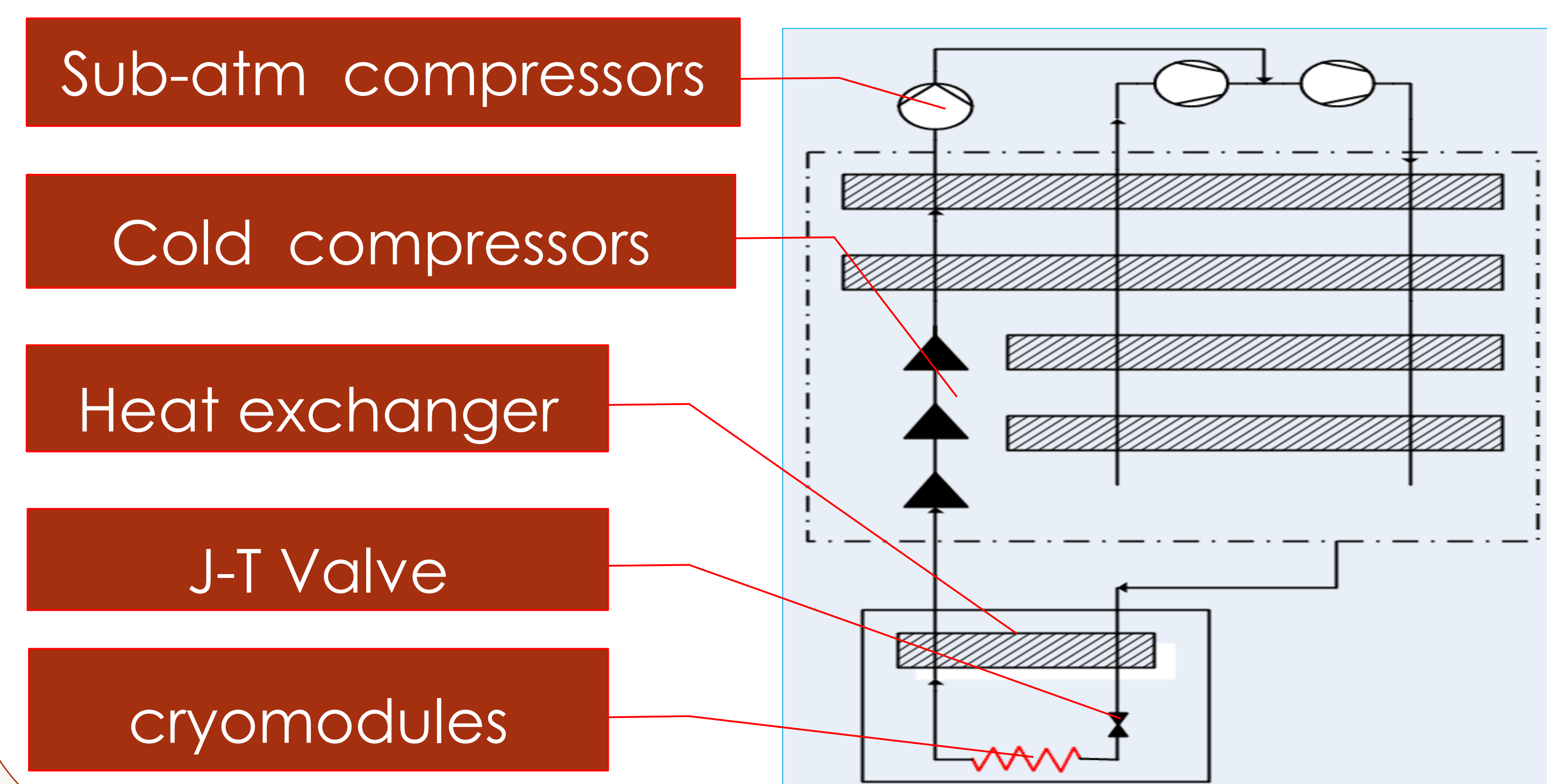
Heat load

	HWR010	HWR019	Spoke042	ellip062	ellip082
Number of cryomodule	2	4	9	11	3
Length of cryomodule	4.44	5.94	2.97	5.54	5.46
Number of cavity	7	7	6	4	5
Number of solenoid	7	7	2	0	0

Facility	2K	4.5-6K	50-65K
Cryomodule	2843	1418	5176
Valve box	80	80	200
Transfer line	100	120	395
Sum	3023W	1618W	5771W
Heat load /4.5K	12.84kW		
4.5K equivalent	15kW/4.5K		

Flow diagram

J-T Valve + heat exchanger + Sub-atm



Conclusions

- The preliminary design is considered reasonable by peer reviewers
- Engineering design will be finished in the middle of next year