

STATUS OF CHINA SPALLATION NEUTRON SOURCE (CSNS)

CSNS Team

The China Spallation Neutron Source (CSNS) facility is designed to provide multidisciplinary platforms for scientific research. The site of CSNS has been selected at Dongguan, Guangdong Province. In the Phase I of the project, the facility comprises an 80-MeV H^- linac, a 1.6-GeV proton rapid cycling synchrotron (RCS), beam transport lines, a solid tungsten target station, and 3 initial instruments for the pulsed spallation neutron applications. The RCS provides a beam power of 100 kW with a repetition rate of 25 Hz. The beam power can be further increased to 200 kW in the Phase II. A series of R&D for major components have been performed since 2006. The project design proposal was approved by the Chinese central government in September 2008. The preliminary site geological survey has been completed. The groundbreaking is planned in 2010.

Key Milestones

Feb. 2001	idea of CSNS discussed
Jun. 2005	project proposal approved in principle by central government
Jan. 2006	CAS funded (30M CNY) for R&D 1
Jul. 2007	Guangdong funded (40M CNY) for R&D 2
Dec. 2007	project proposal review
Sep. 2008	project proposal approved by central government
Oct. 2009	project feasibility study review
May 2010	expect to start project construction (ground breaking)

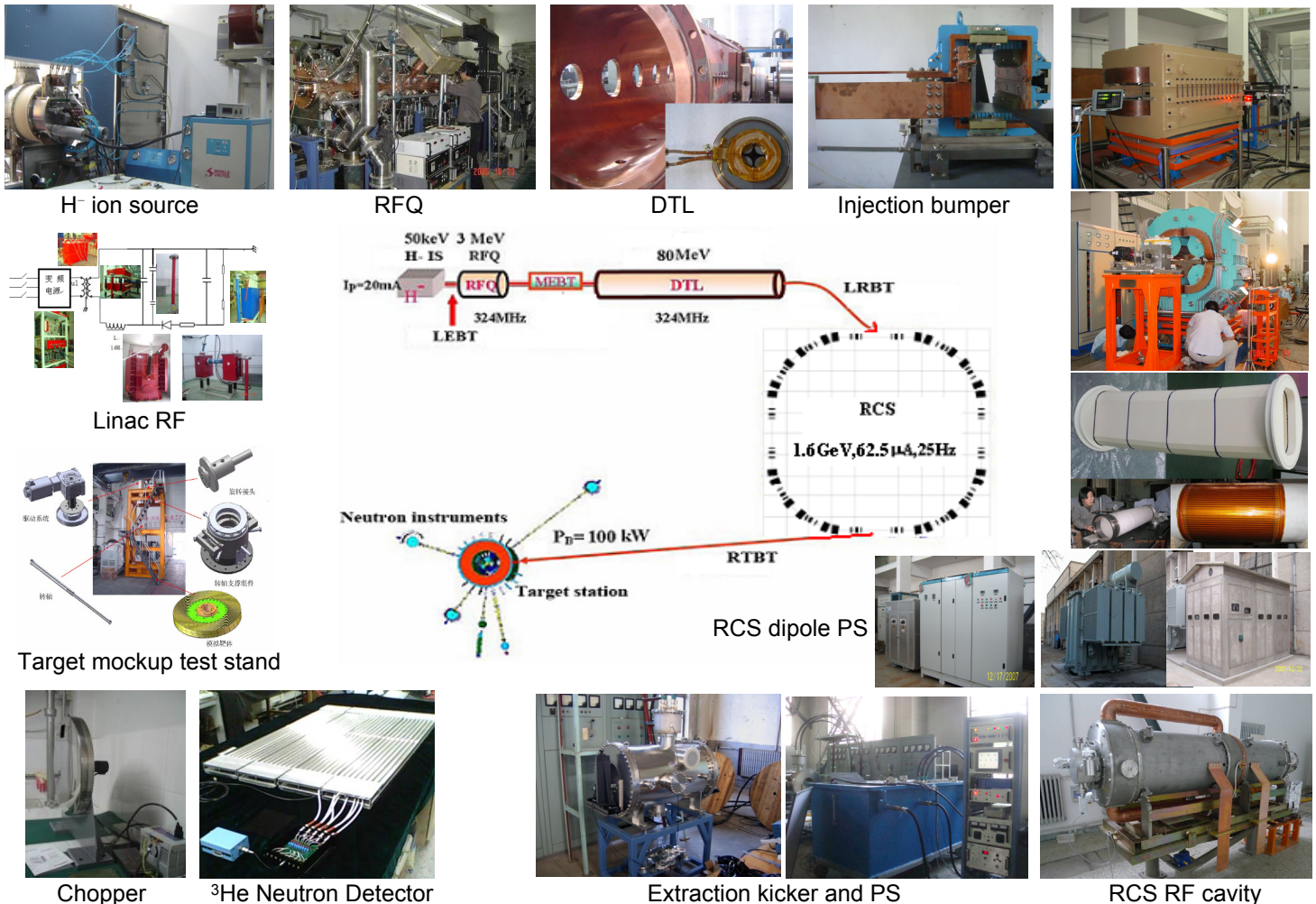
Schedule

Prototyping R&D	Jan. 2006 – Jul. 2010
Construction start	May 2010
Civil construction	May 2010 – May 2013
Component fabrication	May 2010 – May 2014
Installation & tests	Jan. 2013 – Jan. 2015
Integrated system commissioning	May 2014 – Nov. 2015
1st beam on target	Nov. 2015
Project complete/operation start	Nov. 2016

Design Goal

Beam power (kW)	Repetition rate (Hz)	Beam current (μA)	Energy (GeV)	Max neutron flux* ($n/cm^2/s$)	Number of instruments
100	25	63	1.6	10^6	3

R&D and prototyping work has been carried out since 2006. Over 30 prototyping items (covering most key technologies) have been completed and in the test process.



H⁻ ion source

Linac RF

Target mockup test stand

Chopper

³He Neutron Detector

RFQ

DTL

Injection bumper

RCS dipole PS

Extraction kicker and PS

RCS RF cavity

Neutron instruments

Target station

RCS
1.6 GeV, 62.5 μA , 25 Hz

LEBT

MEBT

DTL

LRBT

RTBT

P_n = 100 kW