

Technical Parameters–SNS

Primary Parameters

Proton beam power on target	1.4 MW
Proton beam kinetic energy on target	1.0 GeV
Average beam current on target	1.4 mA
Pulse repetition rate	60 Hz
Protons per pulse on target	1.5×10^{14} protons
Charge per pulse on target	24 μ C
Energy per pulse on target	24 kJ
Proton pulse length on target	695 ns
Ion type (Front-end, Linac ^a , HEBT ^b)	H minus
Average linac macropulse H- current	26 mA
Linac beam macropulse duty factor	6%
Front-end length	7.5 m
Linac length	331 m
HEBT length	170 m
Ring circumference	248 m
RTBT ^c length	150 m
Ion type (Ring, RTBT, Target)	Proton
Ring filling time	1.0 ms
Ring revolution frequency	1.058 MHz
Number of injected turns	1060
Ring filling fraction	250 ns
Maximum uncontrolled beam loss	1 W/m
Target material	Hg
Number of ambient/cold moderators	1/3
Number of neutron beam shutters	18
Initial number of instruments	5

Beam Line Allocation

Beam Line	Position ^a	Moderator	Instrument
1A	TU	Hydrogen decoupled	Ultra-Small-Angle Neutron Scattering Instrument (USANS) ^b
1B	TU	Hydrogen decoupled	Nanoscale-Ordered Materials Diffractometer (NOMAD) ^b
2	TU	Hydrogen decoupled	Backscattering Spectrometer (BASIS)
3	TU	Hydrogen decoupled	Spallation Neutrons and Pressure Diffractometer (SNAP)
4A	TD	Hydrogen coupled	Magnetism Reflectometer
4B	TD	Hydrogen coupled	Liquids Reflectometer
5	TD	Hydrogen coupled	Cold Neutron Chopper Spectrometer (CNCS)
6	TD	Hydrogen coupled	Extended Q-Range Small-Angle Neutron Scattering Diffractometer (EQ-SANS)
7	BU	Water	Engineering Materials Diffractometer (VULCAN) ^b
8A	BU	Water	Future development
8B	BU	Water	Future development
9	BU	Water	Elastic Diffuse Scattering Spectrometer (CORELLI) ^b
10	TU	Hydrogen decoupled	Future development
11A	TU	Hydrogen decoupled	Powder Diffractometer (POWGEN)
11B	TU	Hydrogen decoupled	Macromolecular Diffractometer (MaNDi) ^b
12	TU	Hydrogen decoupled	Single-Crystal Diffractometer (TOPAZ) ^b
13	BD	Hydrogen coupled	Fundamental Neutron Physics Beam Line
14A	BD	Hydrogen coupled	Future development
14B	BD	Hydrogen coupled	Hybrid Spectrometer (HYSPEC) ^b
15	BD	Hydrogen coupled	Neutron Spin Echo Spectrometer (NSE) ^b
16A	BU	Water	Future development
16B	BU	Water	Chemical Spectrometer (VISION) ^b
17	BU	Water	Fine-Resolution Fermi Chopper Spectrometer (SEQUOIA)
18	BU	Water	Wide Angular-Range Chopper Spectrometer (ARCS)

^aT=Top, U=Upstream, D=Downstream, B=Bottom.

^bUnder development.

^aLinear accelerator. ^bHigh-energy beam transport (system).

^cRing-to-target beam transport (system).