

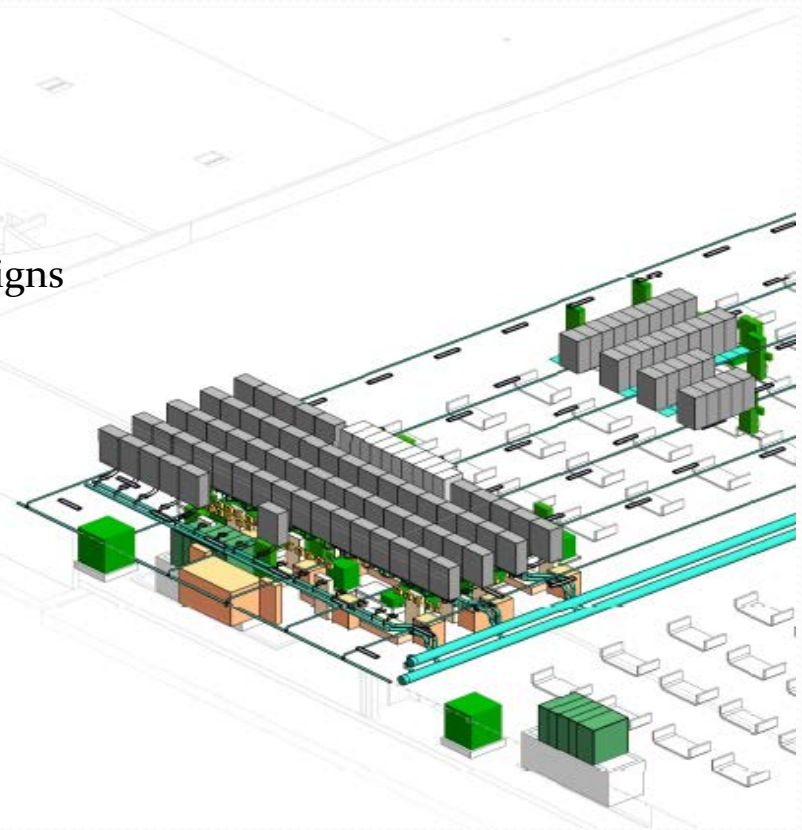
NWSC-3 Facility Requirements



An overview of the NWSC Facility and Support Design Preferences

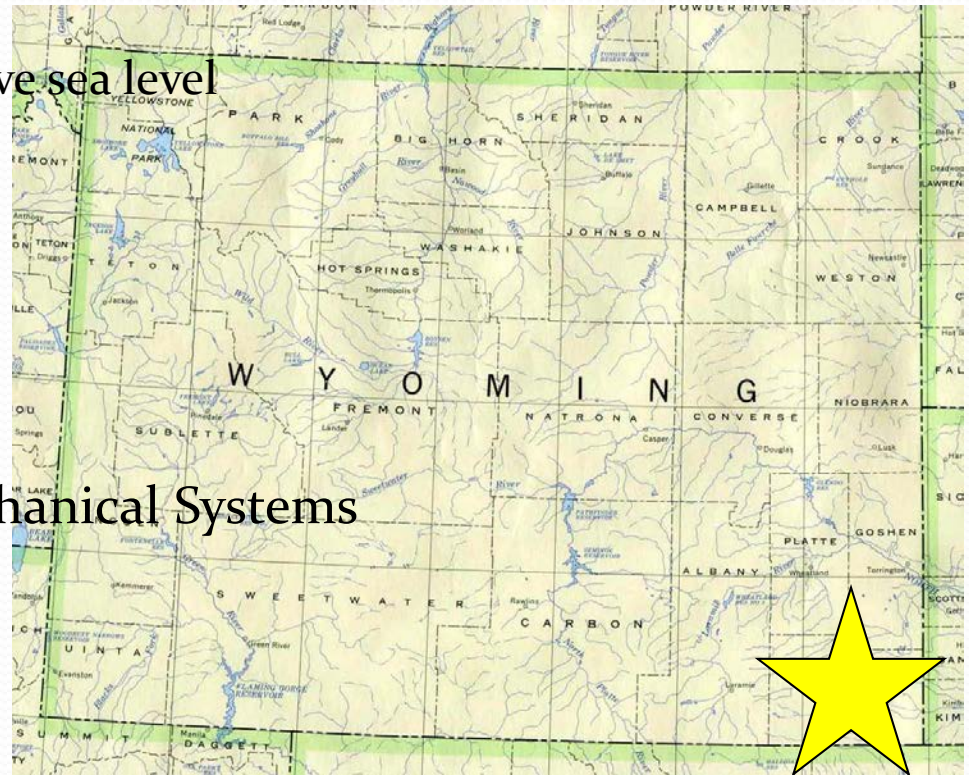
NWSC Facility Design

- Efficient
 - Location – Cheyenne WY
 - High Flow, Low Pressure Mechanical Designs
 - Low PUE (Power Usage Effectiveness)
 - 480V electrical distribution
- Flexibility:
 - Modular Design
 - 10 Foot Raised Floor
 - Power Flexibility
 - Mechanical Flexibility



Efficiencies at the NWSC

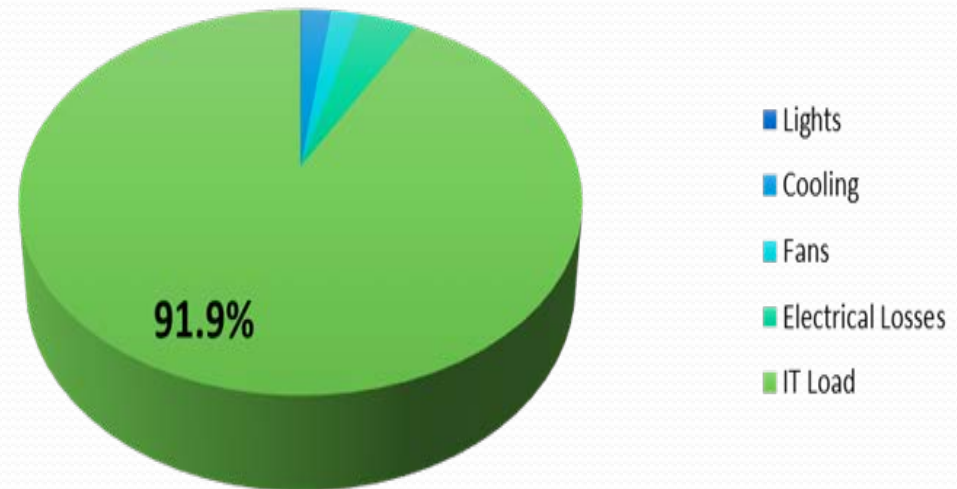
- Location
 - Cheyenne WY – 6,063 feet above sea level
 - Reliable electrical grid
 - Dry and Cool –
 - average temp of 46.4 deg F
 - Average humidity of 42.4%
- High Flow – Low Pressure Mechanical Systems
 - 24” chilled water mains
 - Oversize ductwork
- Efficient Power Systems



Efficiencies Cont.

- 480v Distribution
 - Higher voltages/kw available closer to HPC systems
- PUE of 1.08 when multiple HPC systems are running
- UPS Variable Module Management System (VMMS)

NWSC Design



Flexibility at the NWSC

- Modular Design
 - Allows facility to adapt to systems
 - Easily configurable to new technologies
- 10 foot raised floor
 - Allows for undisturbed conditions during construction
 - No need to “shoe horn” systems into spaces

Flexibility Cont.

- Power Flexibility
 - 480v distribution throughout
 - Space for cutting edge power supplies
- Mechanical Flexibility
 - Free Cooling
 - Re-use excess heat from HPC
 - Ability to change CHWST “on the fly”



NWSC-3 Facility Preferences

- Water Cooled System
 - Current 65F deg CWST – plan to raise during Cheyenne’s lifetime for efficiencies
 - Open to Warm Water Cooling
- Electrical Distributions
 - 480v preference for compute nodes – utility power
 - Critical log-in nodes/network devices can be segregated for UPS power
 - All mechanical systems provided by HPC vendor will be supplied via UPS power
- Air Cooled Equipment
 - Hot Aisle Compatible

Mechanical System Preferences

- Water cooled to chip
 - 65 deg F and higher supply temps
 - Allows support of dense HPC
- Air Cooled Equipment
 - Hot aisle compatible
 - Support 42U racks and larger

Electrical Distribution Preferences

- 277/480v three phase system for compute nodes
- 208 / 120 or 277 / 480v for storage / head-end nodes
- Highly dense racks with high KW ratings
- Networking Equip capable of having a separate power infrastructure



Questions?