Spallation Neutron Source Central Control Room Design

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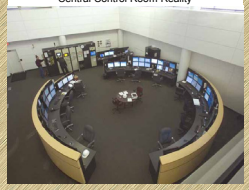
NEUTRON SCIENCES

- Separate Safety system racks and operating consoles
- Circular Arrangement
- Working on inside circumference
- 11 operating stations, 3 to 6 screens each
- Constructed from 11 identical custom-built modules

Central Control Room Design

Central Control Room Reality



Advantages:
- Interior circular design provides equal access for all staff in a concise footprint, encouraging collaboration

Disadvantages:
- Interior circular arrangement does not allow simultaneous view of all areas by the Chief Operator
- Too much daylight from windows on three sides (shades have since been installed)
- Bathroom is too far away

Operational Requirements

- Maximize Line of sight viewing of the Software Development Area window and Safety System racks.
- Dedicated, separate area for access control
- An operator work area that is allows both keyboard and standard size loose leaf notebooks, lap top computers, etc. in front of the monitor screens.
- Easy access to Machine Protection System Crash, USB ports, PA microphones, phone, AC power outlets, business network, control network, and test network
- Ability to reconfigure each operating station to split the 6 screens between Windows / Linux PC's and connections to the business, control, or test equipment networks

Ergonomic Requirements

- A quiet, office type environment (noise from CPU fans and other sources abated as much as possible)
- Adjustable flat screen mounting that will allow adjusting height, depth, and horizontal location
- Completely open foot-space in the front (operator area) **between** modules in each arc
- A table top in front of monitor screens deep enough to support arms and wrists at the keyboard or mouse and provide for additional working area for reading, writing, etc.

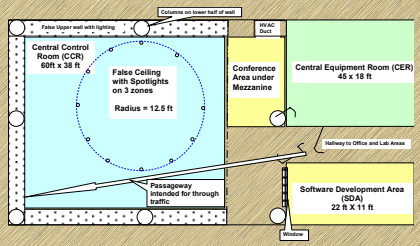
Equipment Requirements

- Adequate intake and exhaust vents for cooling the equipment compartment (CPU).
- Easy access to cable area where cabling can be added or re-arranged when needed.
  - – Front Panel access to CPU
  - – Rear Panel access to cabling
- Operating Console: Modular design and fabrication method to fit through double door entrance to control room.
  - – 11 identical modules, custom-built
- Loads divided between UPS and Clean AC power so that loss of either will not leave operators blind.
- Redundant network switches for operations, a single switch for the test network, and a single Enterprise network switch.

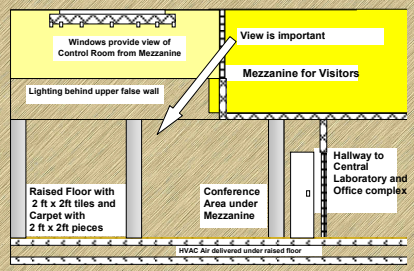
Aesthetic Requirements

- All cabling hidden from view
- Other than the work area in front of the screens, horizontal surfaces that attract clutter should be minimized
- Use materials and color schemes that present an attractive display (from above on the control room mezzanine as well as floor level), that are compatible with central control room carpet, and that match the color scheme of the CLO building (black and maple wood)
- A rear wall hiding the flat screens, as high as the screens so that personnel cannot lean over and interrupt operators, and with a wall top edge that is sloped so that items (especially coffee cups) cannot be placed on top of it.
- Nice view from visitor Mezzanine above

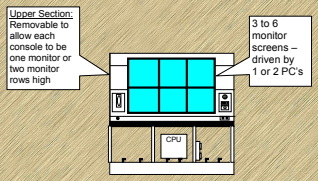
Control Complex: 4 Areas (top view)



Control Room and Mezzanine (side view)

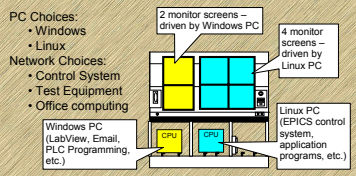


Console Module Design (front view)

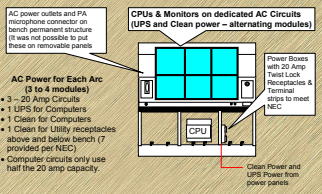


Console Module (multiple PC's)

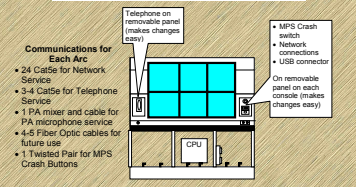
One Operator Station, 2 PC's



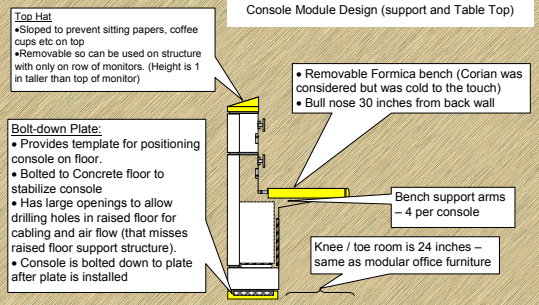
Console Module Design (front view)



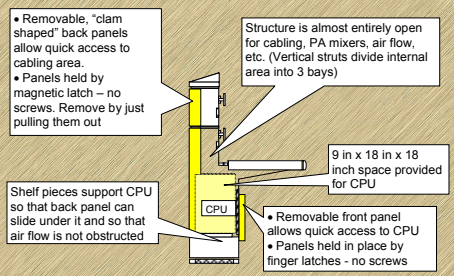
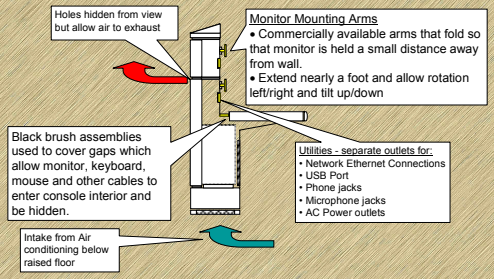
Console Module Design (front view)



Console Module Design (support and Table Top)



Console Module Design (Access and CPU Enclosure)



Console Design (Monitors, Keyboard and Utilities)