



Tunnel Temp Issues (Limitations, Requirements, Desirable Features, Design)

Tom Lackowski
Fermilab



Major Breakdown

- Creature Comforts
 - Work environment
 - Productivity
- Machine environment
 - Life cycle cost
 - Reliability



Creature Comforts

- A combination of temperature and humidity – WB & DB Temperature
 - Initial installation, during operations, during shutdowns periods
 - OSHA Guidelines
 - Criteria is subjective, based on type of work and % of rest time allotment
 - Need to understand the type of work, duration of work, and hazards of the work in order to reach a consensus that is reasonable,



Machine Environment

- **Beam Tunnel**

- **Humidity**

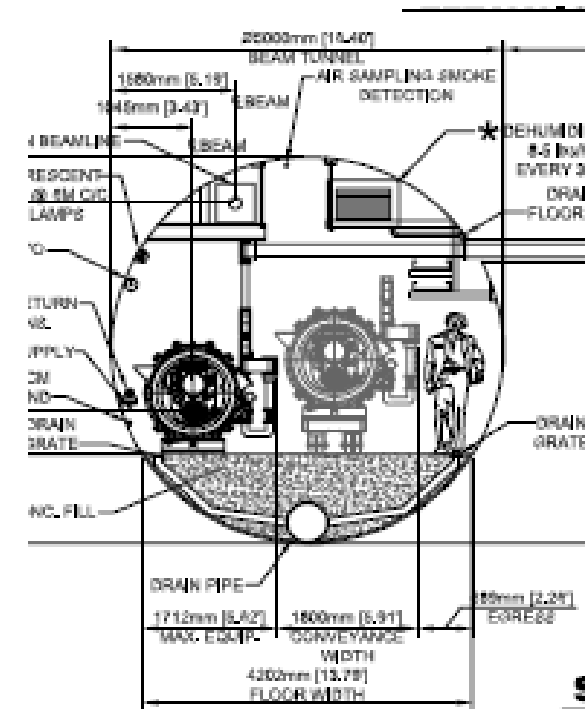
- Conventional will require the humidity to be maintained below “wet” conditions to protect conduits, concrete, and structural attachments.
 - Other requirements?

- **Air Flow**

- Flow for humidity control, personnel access, and to control gas build-up.
 - Fire and purge separate.

- **Temperature (Stability)**

- ?





Service Tunnel

- Humidity and Air Flow – similar requirements as Beam Tunnel.
- Temperature
 - Heat to air can be controlled for a number of components. Air temperature models being modeled at Fermilab. (Just started – need three weeks)
 - Certain components benefit from a reduced operating temperature – can be resolved via a number of alternative designs.
 - Currently the criteria for temperature stems from assumptions made for creature comforts.



Creature Comforts – Service Tun.

- Discussion topics
 - Current design assumptions
 - Tunnel occupancy, frequency, type of work activities
 - Consensus on OSHA description
 - Design alternatives and cost drivers