

# SD Manufacturing, Assembly and Deployment in SE Colorado

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# Re-thinking the SD for SE Colorado

- SD optimization in SE Colorado may be significantly different from Argentina for several reasons:
  - Colder winters may require extra thermal insulation to prevent freezing
  - Significantly higher unit labor cost
  - Different logistical and customs problems
  - Likely easier deployment environment

# Re-thinking involves...

- Re-optimizing component design
  - Can we reduce the required labor for assembly?
  - Can we re-optimize tank design to incorporate insulation (foamed PE? Insulating sheets?) as structural elements and perhaps reduce total material requirements?
  - Can we re-design the SD stations to speed deployment (Larger hatches for easier access? Molded-in cable mount points? Improved tank surface properties to reduce handling after delivery? Less internal access required? Fewer screws?)
  - Can we modify the tank design to facilitate deployment (More strong points? Built-in tie points to hold PMTs during deployment?)
  - Etc....

# Re-Evaluating Assembly...

- Where should assembly occur
  - How much diversified assembly, how much at (or near) the site
  - How much assembly can/should be sub-contracted out?
  - What facilities are required in SE Colorado?

# And Re-evaluating Deployment

- Project personnel vs. external contractor?
- Optimal Deployment Rate
  - Vehicles required
  - Facilities required
  - Labor required
  - Funding profile required

# Time is of the Essence

- We should begin now because
  - With luck, Southern SD assembly and deployment will be completing “soon” (One year?), and we want to gather information from the experts before they disperse
  - It is likely we are near peak efficiency in southern SD station production now, and we should take a snap-shot of the actual techniques used after significant refinement from the original planning documents
  - Some information (e.g. freezing studies) takes time to collect, and can't be accurately accelerated
  - The longer we think about it, the longer we have to have great ideas, and test them
  - This information is critical to producing an accurate proposal for the Northern site.

# A Suggestion...

- Establish a working group to collect and re-evaluate the detector design (from a production and deployment standpoint) and update the procedures documents (if necessary), and make a preliminary report at the spring collaboration meeting (while deployment will still be ongoing and the experts still available for consultation).

# Short-term Plans in Colorado

- Approximately \$15K is available from the State of Colorado to purchase equipment for use in SE Colorado.
  - 1 or 2 SD tanks for freezing studies
  - Monitoring and measuring equipment to make these tests
  - Automation of LIDAR system
- We will request approximately \$15K in matching funds from CSU to support personnel to use this equipment, and to begin to study deployment issues.
- We hope to begin freezing tests and thermal modeling of insulated SD tanks this winter

# Another Rotational Molder...

- RMB Products; Fountain, Co. (2 hours west of Lamar)
- Oven currently slightly too small (12' sphere), but "Very excited to enlarge"
- Solid technical staff (3 ME, 1 CE...)
- Extensive testing facilities (mechanical and materials properties)
- Work extensively in pharmaceutical, chemical, and semiconductor industries (used to tighter mechanical specifications than typical for agricultural applications)

