

### SITUATION:

A Canadian oil sands producer planned an expansion to their production facilities in Northern Alberta. Smith LaRock Architecture was tasked with collaborating with the owner and their engineering procurement contractor to design the Control Suite for the new facility.

The bitumen production mine control facility was to be housed on the second floor of a new administrative building being designed by others. The initial phase included a control room equipped with operations consoles, plus room for expansion at a future date. The room was sized based upon recommendations and design considerations developed by SLA and its Human Factors consultant.

### APPROACH:

Several primary challenges to the second floor concept existed.

- Access: Design a control center on the second level of a new commercial/industrial building.
- Structural simplicity: Maintain the function of coplanar floor levels in an environment requiring irregular floor-to-floor heights through its need for a depressed slab and tall ceiling height requirements.
- Security: Prevent unnecessary access to the control suite while fostering visibility from adjacent spaces.
- Lighting: Allow the use of natural light to foster a connection to the outdoors.
- Situational Awareness: Design a theatre-style control room to encourage a face-forward, heads-up control posture while sharing common information about extraction processes

The Smith LaRock team focused on the fundamental needs of the room: console to console visibility, acceptable noise levels, minimal glare, and proper overview ergonomics within the room. The client's requirements were based upon operator need, particularly viewing corridors to 100" displays at the front of the room. Using SLA's collaborative human factors approach, ergonomic view planes from each console position to the overview displays were defined.

At full build-out, the room would typically house 12-14 operators per shift, plus a shift coordinator and occasional application engineers.

During start-ups, upsets and shift changes, this number (and noise levels) could easily double. This posed several dilemmas for the key design goals and face-forward room plan.

Furthermore, with so much activity expected, significant radio traffic and noise was also anticipated. Based upon its past experience, the owner initially requested parabolic sound domes - acrylic domes designed to focus sound down onto the operator from above. SLA noted immediately that the utility of the theater style would be challenged by the disruptive character of suspended domes. Filling the control center with these suspended bubbles would interrupt views to the display wall and create reflective glare from planned lighting placement.

Smith LaRock's design solution addressed the lighting, visibility and acoustical dilemmas posed, resulting in an innovative and significant departure from traditional design examples. Lower ceilings and reduced structure height lead to reduced core and shell costs, elimination of exposed light fixtures in the control room, sound isolation at each console, and a visually pleasing and calming atmosphere. A 3D walkthrough of the solution is available on SLA's video compendium.

### RESULT:

The design developed by Smith LaRock reconciled the client's expressed challenges in a single, simple and cohesive design. Visibility is maximized for all operators. Ambient sound levels are akin to a quiet office. Illuminated ceilings meet the required vigilant light levels prescribed by the owner and industry best practices.

Despite challenges, SLA created a room design that achieves the owner's goals and allows operators to perform their jobs oblivious to the complex architectural gymnastics surrounding them.

