

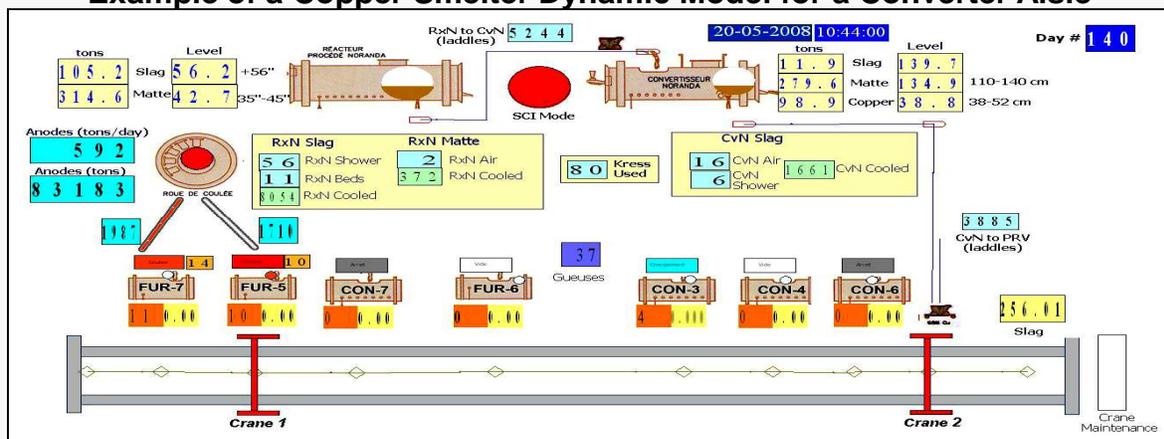
## Dynamic Simulation / Scheduling

**Dynamic simulation** is the time-based simulation of an operating plant or process such as a copper smelter. Computer-based dynamic simulation has become an increasingly powerful tool over the last two decades aimed at optimization of complex industrial operations. The ability to dynamically simulate a given plant or process over time, such as a week or a year of operation including running times and potential downtimes, can provide invaluable insight to the understanding of a plant. This can help in projects to increase throughput, plant de-bottlenecking exercises, or in brownfield expansion projects (**discrete event modelling**).

Combining XPS expertise in metallurgical processing along with the dynamic modelling capability of the Arena® software, the Extractive Metallurgy Group at XPS now has full dynamic modelling capability. XPS is now using this capability to completely model a given plant, such as mineral processing, hydrometallurgical or pyrometallurgical operations. User-friendly interfaces are used to allow effective presentation and interpretation of the results.

Combining thermodynamic modelling (Factsage®), heat and mass balance modelling (Metsim®) and now dynamic simulation (Arena), the Extractive Metallurgy Group at XPS can be considered a leader in metallurgical modelling.

### Example of a Copper Smelter Dynamic Model for a Converter Aisle



## Key Capabilities

**Arena®** software is a commercial software package, which along with plant knowledge, allows for effective dynamic simulation of complex processes. It is well adapted to the modelling of a complete metallurgical plant having a number of complex and interacting operations. All types of unit operations can be incorporated into the model. This can range, for example, from systems for materials handling - feed conveyors, slurry pumping or crane and ladle transfers - to individual unit operations such as a high temperature smelting furnace, a leach tank or a milling operation.

Arena® has been applied in the following situations:

- Understanding and resolving a number of plant bottlenecks to allow full plant entitlement to be reached.
- Determining plant capacity under certain upset conditions (such as maintenance situations, unexpected shutdowns, etc.).
- Optimizing operating schedules.
- Overall flow-sheet optimization

**Recent projects successfully completed by XPS using Arena® include:**

- Sudbury Integrated Nickel Operations smelter, Sudbury, Ontario - Model to examine alternative expansion options.
- Glencore Copper Canada smelter, Rouyn-Noranda, Quebec - Model to evaluate a brownfield expansion situation.