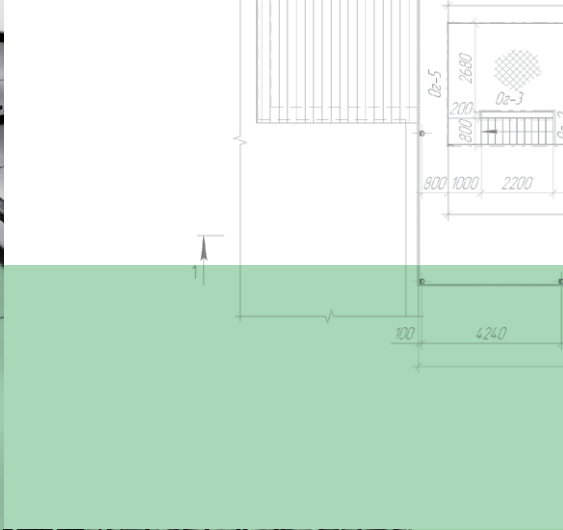




STEADY STATE SIMULATION



The fundamental model of a continuous process flowsheet is the steady state mass and energy balance. All information about material and energy flows, stream composition, chemical reactions and physical separations is combined into a single model. Although it is a standard tool in process engineering, the flowsheet balance can be a source of frustration and delays if not approached in the right way. A methodical, disciplined approach helps minimise errors, avoid repetition and give the overall shortest path to a finished flowsheet design.



Managing Scenarios and Finding the Sweet Spot

Through scoping and feasibility studies the number of flowsheet options can be large. New information about the metallurgy, plant cost and revenue stream regularly comes to light, so the optimum flowsheet is often a moving target. Economic calculations are fed back to the process design to narrow the range of attractive options, with technical risk and operability also considered. Ultimately the mine plan gets linked to the plant capital cost, operating cost and revenue, in order to find the 'sweet spot' where the NPV is optimised both in magnitude and robustness.

In this environment of uncertainty, the flowsheet model is invaluable to show which options are clearly uneconomic, which are marginal and which are robust. The model must be flexible enough to deal with alternative configurations, changing reaction conditions, different ore compositions, higher/lower tonnages and various other constraints. The guidelines above help with managing multiple scenarios and updated information.

Simulus has integrated flowsheet models with a cost estimation database, creating a tool that streamlines engineering studies and gives great flexibility in project optimisation. The model outputs a full equipment list, electrical load list and operating cost drivers. For the client this means faster delivery and, ultimately, better design.

The Simulus Approach:

- All model input data clearly listed in spreadsheet format, and traceable to the original source
- Models built using standard, controlled blocks wherever possible.
- Document control: Consistent naming conventions, model version control and scenario management, including protocols for revisions, internal approval and client approval.
- Quality control systems: A standard workflow and checksheet system for all inputs, outputs and model files.
- Documentation: Written descriptions in plain English describing model structure and operation.

The Simulus Team

Simulus has a dedicated simulation team armed with the best software along with the skills and systems to get the most out of it. We are committed to:

- Open collaborative engagements with clients
- Systematic checking and validation
- Flexibility and responsiveness
- Doing the job once, properly

From simple crushing circuits to the most complex of metallurgical refineries, the same guidelines apply. Our simulation expertise combined with years of experience in minerals testing, plant design and operation gives Simulus the ideal skill set for flowsheet modelling.

TWICE THE ENGINEERS

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