

**Part A: Suitable for Beginners: Airflow, Stages, Calibration & more...**

| Day | Topic                               | Content  |
|-----|-------------------------------------|--|
| 1   | <b>Ventsim / Ventilation Basics</b> | <ul style="list-style-type: none"> <li>• Introduction to mine ventilation simulation.</li> <li>• Using the mouse and toolbars.</li> <li>• Managing the display (colours, data, views).</li> <li>• Drawing, moving, copying and deleting airways.</li> <li>• Creating airflow.</li> <li>• Specifying airway attributes – sizes, friction factors and resistances.</li> </ul>  |
|     | <b>Building a Model (Tas)</b>       | <ul style="list-style-type: none"> <li>• Constructing shafts, ramps and stopes in 3D.</li> <li>• Import mine design, simplifying and filtering.</li> <li>• Using grouping, levels, layers and saved views.</li> <li>• Constructing and simulating ventilation ducts and auxiliary ventilation systems.</li> <li>• Multiple duct arrangements and methods.</li> <li>• Leakage factors and techniques.</li> </ul>  |
|     | <b>Optimisation of Airway Sizes</b> | <ul style="list-style-type: none"> <li>• Calculating the most efficient airway sizes.</li> <li>• Ventilation power, fan and mining costs.</li> <li>• Selected and global optimisation of models.</li> </ul>  |
|     | <b>Fans</b>                         | <ul style="list-style-type: none"> <li>• When to utilise fans, fixed pressures and fixed flows to produce ventilation.</li> <li>• Entering a fan curve into Ventsim DESIGN, FSP versus FTP.</li> <li>• Fan efficiencies, power and operating density.</li> <li>• Fan configurations, parallel vs series, shock losses, diffusers.</li> <li>• Fan problems, stalling and low / no pressure.</li> <li>• Fan stall predictor tool, Fan database.</li> </ul> |
|     | <b>Practical Exercise</b>           |  |
| 2   | <b>Stages</b>                       | <ul style="list-style-type: none"> <li>• Recapitulation on building a model.</li> <li>• Advantages of using stages.</li> <li>• How to use stages.</li> <li>• How to apply specific changes.</li> <li>• Common mistakes and how to avoid them.</li> </ul>   |
|     | <b>Surveying for Modeling</b>       | <ul style="list-style-type: none"> <li>• How to plan for an efficient survey.</li> <li>• Where and what to measure.</li> <li>• Which instruments to use (advantages and disadvantages of different units).</li> <li>• How to use VentLOG to take readings.</li> </ul>  |
|     | <b>Model Calibration</b>            | <ul style="list-style-type: none"> <li>• Using VentLOG to compare reading and simulation.</li> <li>• How to calibrate the model.</li> </ul>  |
|     | <b>Practical Exercise</b>           |  |

**Part B: Suitable for Advanced Users: Trade Offs, Gas, Heat, Fire & more...**

| Day | Topic  | Content   |
|-----|--|---|
| 3   | <b>Recapitulation Exercise (Pajingo)</b>         | <ul style="list-style-type: none"> <li>• DXF construction techniques.</li> <li>• Error finding and solutions.</li> <li>• Placement of ventilation controls.</li> <li>• Installing fans and optimising airway sizes.</li> <li>• Methods of improving ventilation quality.</li> </ul>   |
|     | <b>Contaminant, Gases and Recirculation</b>      | <ul style="list-style-type: none"> <li>• Simulating smoke, fumes and other contaminants in a mine.</li> <li>• Concentration and spread of contaminants.</li> <li>• Modifying ventilation models during simulation – open / closing doors, fans etc.</li> <li>• Graphing contaminant levels over time, reducing clearance times.</li> <li>• Calculating gas and fume building over time in a mine (dynamic and steady state simulations).</li> </ul> |
|     | <b>Heat and DPM Simulation</b>                   | <ul style="list-style-type: none"> <li>• Introduction and theory to heat simulation.</li> <li>• Types of heat present in a mine.</li> <li>• Configuring the simulation environment for heat simulation.</li> <li>• Physiological effect of heat on people.</li> <li>• Simulating equipment, diesel machines and electrical motors in models.</li> <li>• Problems and solutions in thermodynamic modelling.</li> </ul>                               |
|     | <b>Practical Exercise</b>                        |   |
| 4   | <b>Trade Off Simulation (BEV, Cooling, etc.)</b> | <ul style="list-style-type: none"> <li>• Estimate ventilation reduction when using BEV.</li> <li>• Study pro's and con's of different cooling options.</li> </ul>   |
|     | <b>Fire Simulation</b>                           | <ul style="list-style-type: none"> <li>• Introduction and theory to fire simulation.</li> <li>• Adding a fire in Ventsim.</li> <li>• Adding events in Ventsim.</li> <li>• Analysing results from the Fire Simulation.</li> <li>• Using the escape routes simulation.</li> </ul>   |
|     | <b>Blast Pressure</b>                            | <ul style="list-style-type: none"> <li>• Blast simulation demonstration used to display potential control failures.</li> </ul>  |
|     | <b>Question Time</b>                             |   |