

SC-SS01: INTRODUCTION TO STEADY STATE PROCESS SIMULATION

OBJECTIVES

The course content covers the basic needs of process simulation users. The basic unit operations are introduced in a stepwise manner with the objective of being able to build flowsheets by the end of the course. The use of several software functionalities will show users how to explore operating alternatives for the processing plant units that are being studied. The course has been designed to include many hands-on exercises to facilitate a more efficient and interesting learning experience. Theory is used to introduce the objectives of every module in the course as well as to help attendees to understand how the underlying calculations are performed.

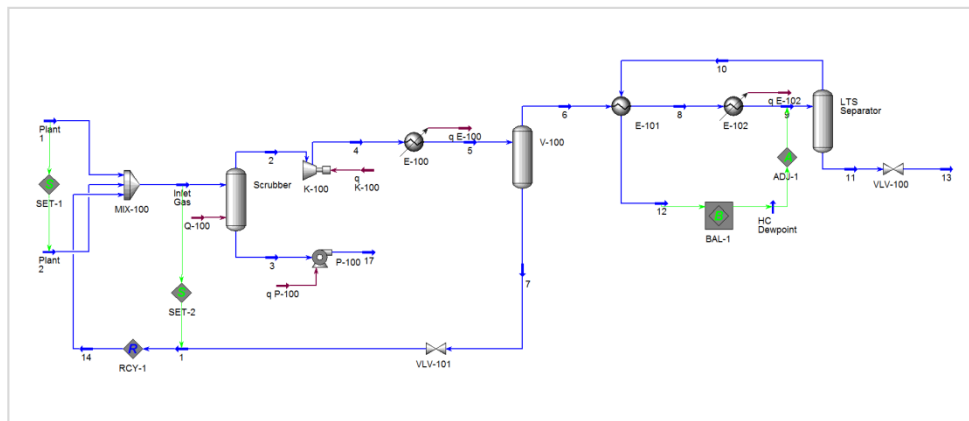
PARTICIPANTS

This course is intended for engineers beginning to use process simulation as well as for those who already use it but who need a refresher to experiment with new software features or extend the applications they use process simulation for. The workshops have been designed with an increasing complexity, in order to help in developing the attendees' learning curve.

The course content is aimed at process engineers, control engineers, safety and environmental engineers, planning engineers and engineers from other departments where process simulation is or could be in use.

CONTENTS

The concepts acquired during the course will allow engineers to build their own process simulation cases to solve problems in their daily design studies. Basing decisions on rigorous simulation results will lead to better and quicker decision-making and furthermore, to improve confidence in the decisions taken.



THREE-DAY AGENDA

MODULE	MODULE TITLE AND SHORT DESCRIPTION	TIME	DAY
1	INTRODUCTION TO THE PROCESS SIMULATOR Working with an existing case. Getting used to GUI elements. Setting-up a user preferences file. How to work with fluid streams. How to install stream utilities. How to install and connect unit operations. The Degrees Of Freedom concept.	3 hours	Day 1
2	BASIC THERMODYNAMICS Creating a new case. How to select components for a simulation: Traditional - hypothetical. The need for thermodynamic correlations and methods.	1 hour	
3	HEAT TRANSFER UNIT OPERATIONS Heaters, Coolers, Shell & Tube Heat Exchangers. Air coolers. Design calculations. Rating simulations.	2 hours	
4	REPORTING Exploring how to extract the results obtained in the simulation calculations by the generation of internal reports or by exporting them to a third software.	1 hour	
5	LOGICAL OPERATORS, SPREADSHEET & CASE STUDY Additional mathematical tools sometimes needed to drive the simulation results to the desired optimal or conditional solution. Set. Adjust. Balance. Recycles. Use of the internal Spreadsheet to enhance the level of possible flowsheet calculations. Sensitivity Analysis (Case Study Tool).	4 hours	Day 2
6	DISTILLATION COLUMNS Distillation columns: How to install, define and solve distillation columns. Absorbers. Condensers and Reboilers. Column Design. Column Sizing.	3 hours	
7	REACTIONS AND REACTORS How to define several types of reactions. How to use them inside reactors in the flowsheet. Basic reactors (conversion, equilibrium, Gibbs). CSTRs. PFRs.	3 hours	Day 3
8	COMPRESSORS, PUMPS AND PIPELINES Simulation of compressors and pumps, with and without curves. Calculation of outlet conditions. Modelling of pipelines for pressure drop and heat transfer calculations.	3 hours	
9	ECONOMIC EVALUATION In order to develop the most economical design of a process or a unit, not only must the production and the purity be considered, but the operating costs as well. The use of internal spreadsheet will enhance the level of possible flowsheet and economical calculations. Case Studies for Sensitivity Analysis.	2 hours	