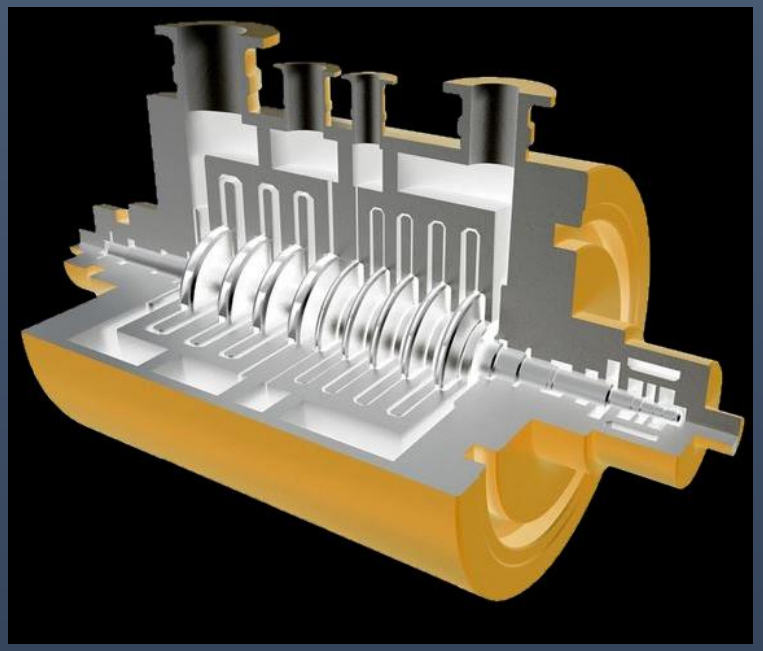
CTrend

A Performance Map Simulation and Data Trending Software for Process Centrifugal Compressors Designed to API617 (Oil & Gas / Refinery & Petrochemicals)



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Rotating Equipment

Summary

- Introduction
- Modeling Process & Software Description
- Benchmarking & Demo (Case Study)

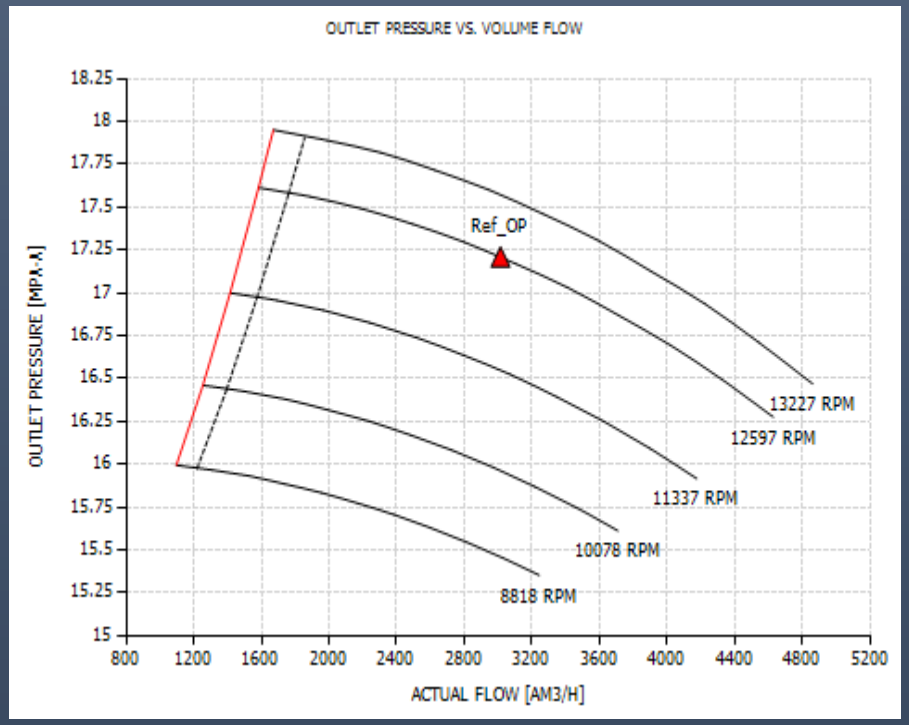
Introduction

Illustration of Existing Compressor

Photo: Siemens Energy

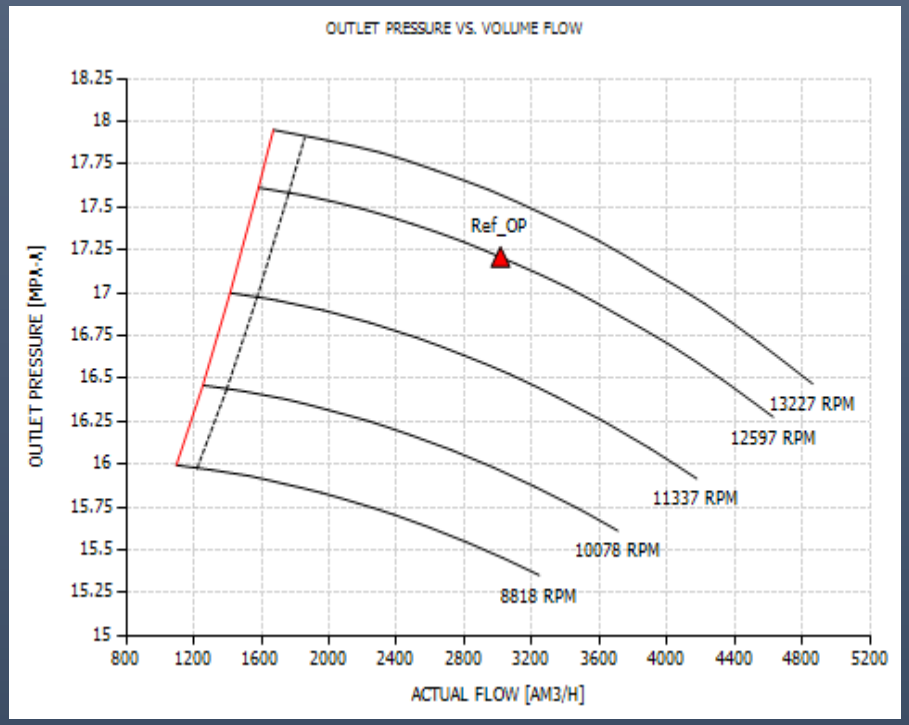
Reference Compressor Map

(provided by Vendor as part of Databook)



Introduction

Centrifugal compressor map is dependent upon inlet conditions



Compressor operating
@ REFERENCE conditions

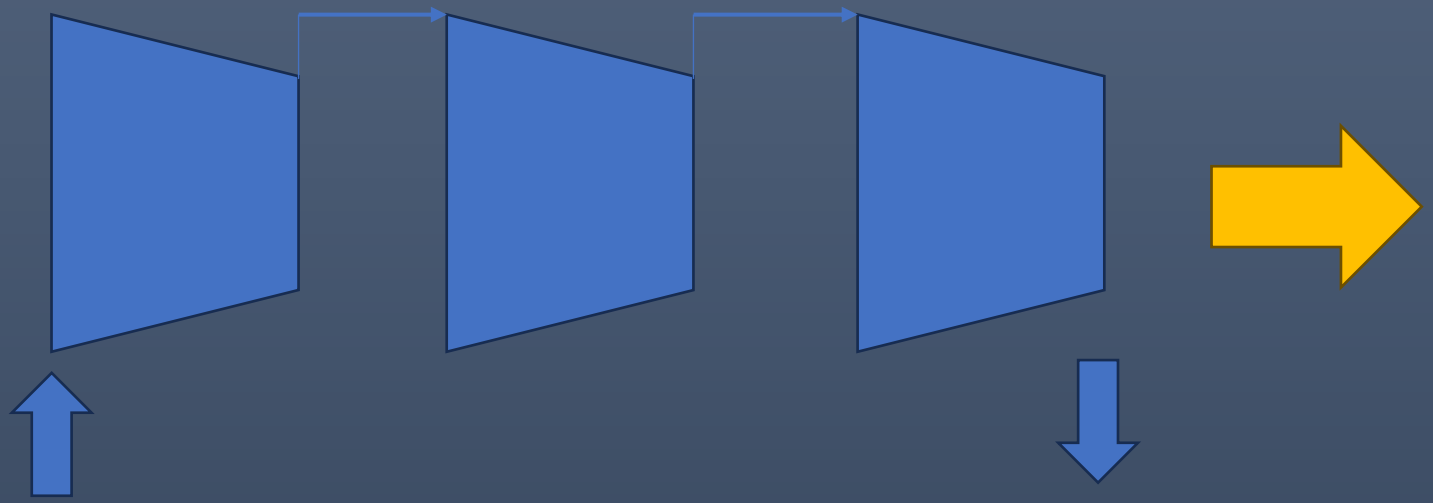
Changes in field conditions, gas composition etc.

?

Compressor operating
@ NEW conditions

Introduction

- Tandem Train / Multi-Casing & Back-to-Back Compressors
- Changed Field Conditions and Gas Composition
- Higher Pressures (Compressibility ↗↗)



Inlet conditions
P1, T1, MW

Outlet conditions
P2, T2, MW
Shaft power

Ctrend simulates performance output @ new conditions based on reference map information

Modeling Process & Software Description

STEP 1

Obtain existing compressor process data and impellers information (datasheet)

Obtain existing compressor map (convert in tabular format)

Define design condition and speed

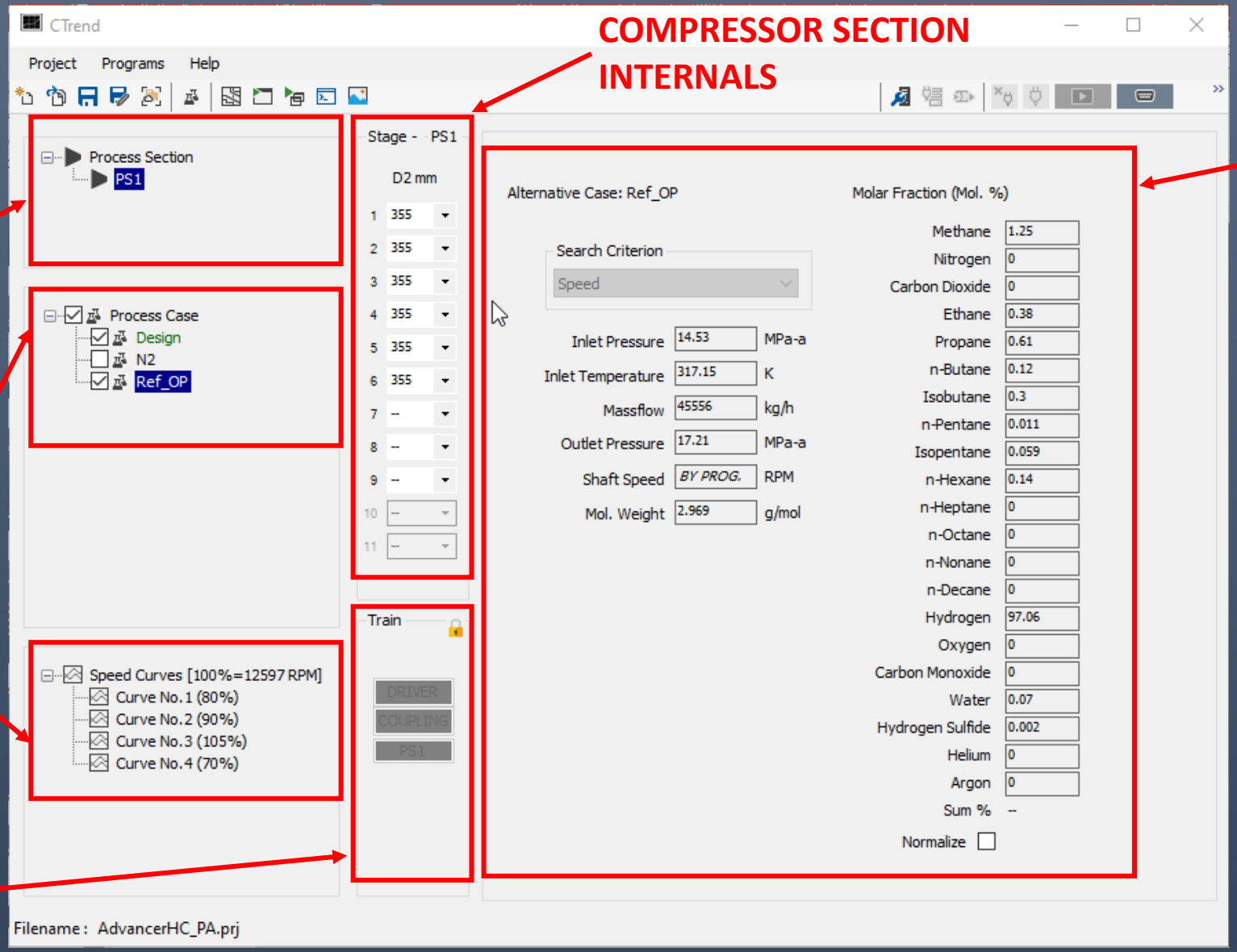
STEP 2

Enter data into CTrend and generate automatically a so-called thermodynamic signature of the existing compressor section

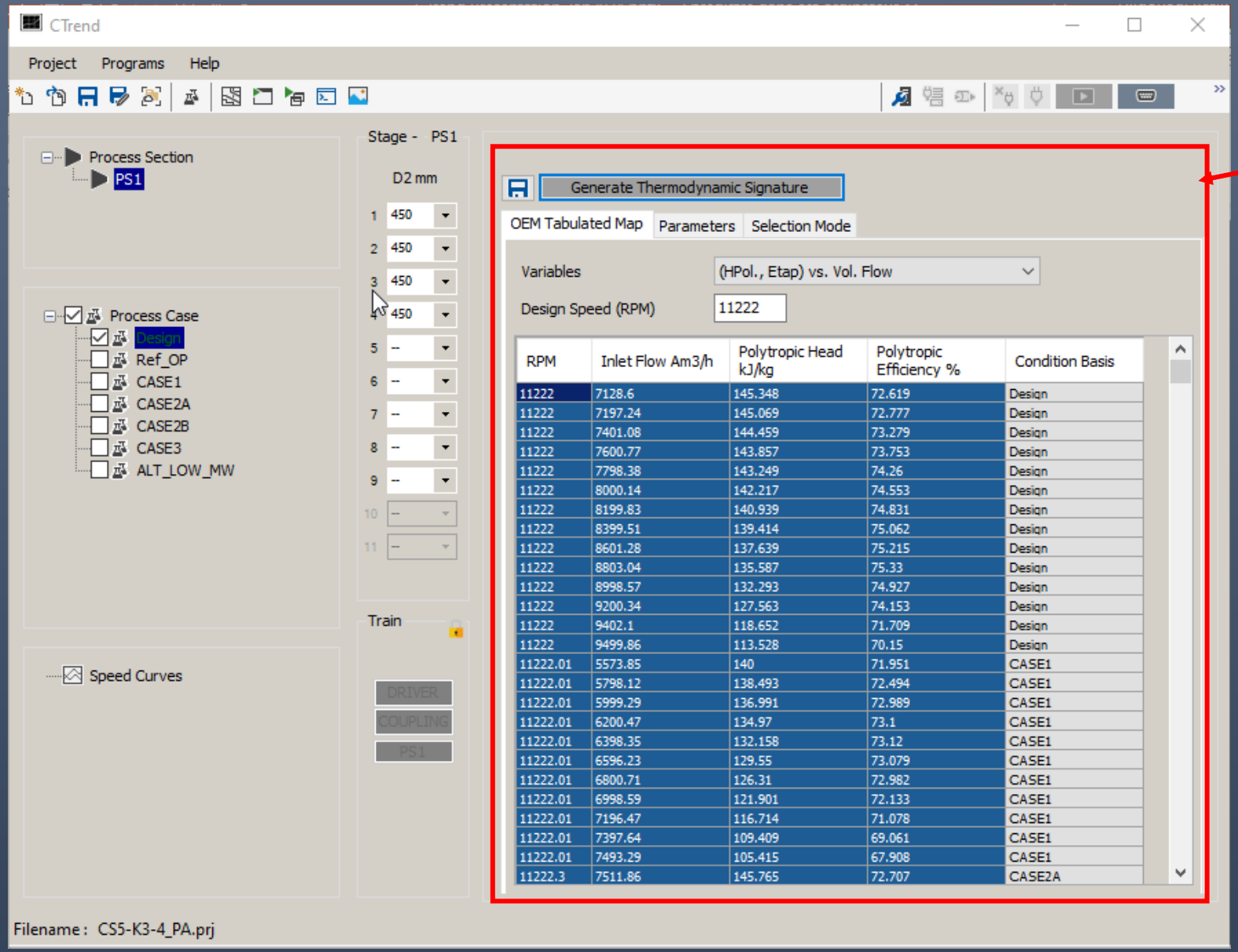
STEP 3

Simulate off-design and new conditions performance

Modeling Process & Software Description

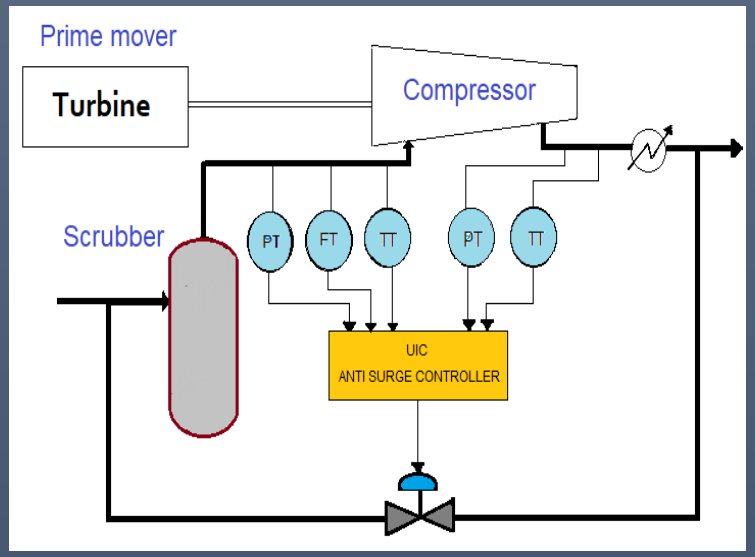


Modeling Process & Software Description



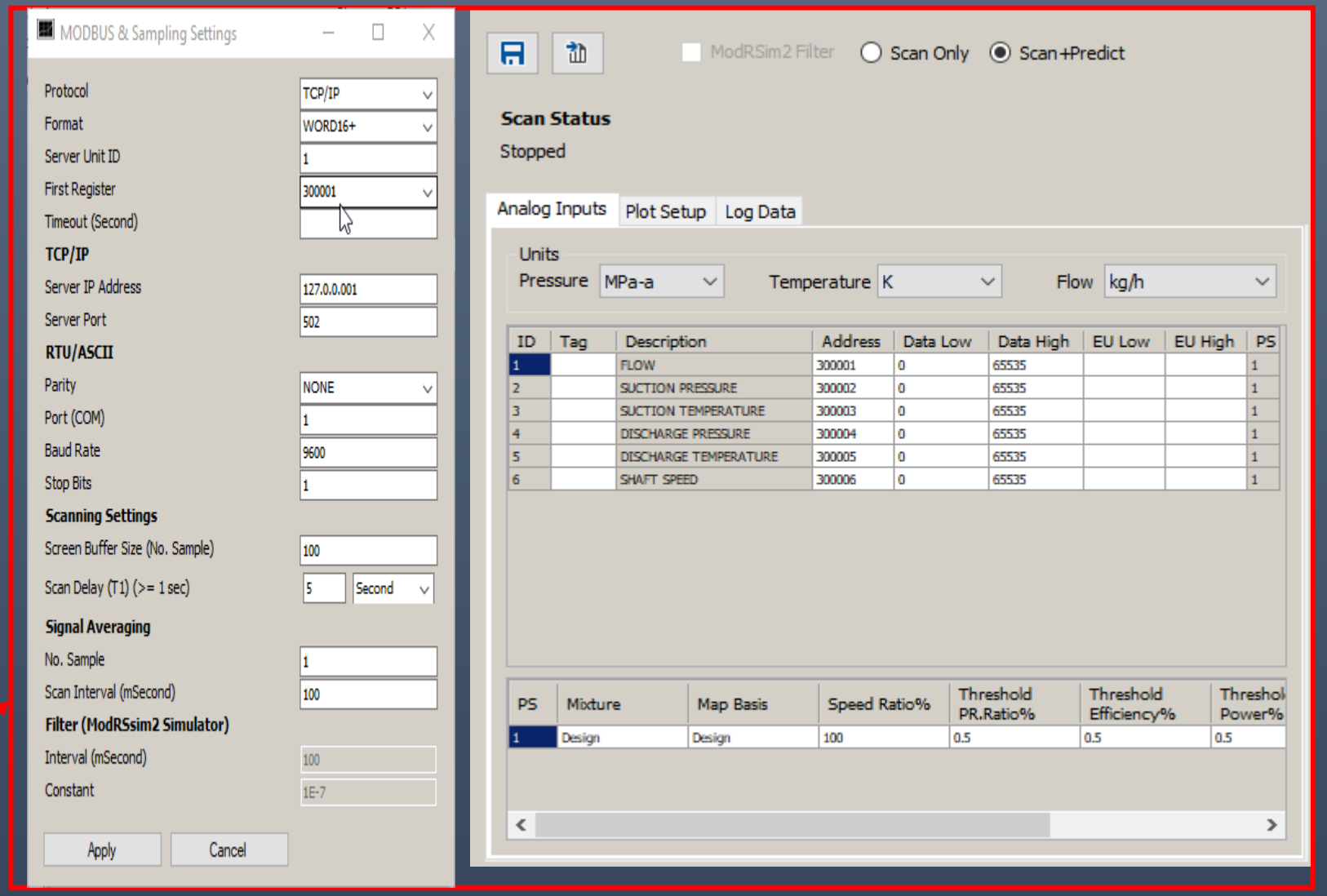
OEM REFERENCE MAP DATA

Modeling Process & Software Description



Monitoring
& Trending

MODBUS
CONFIGURATION



Benchmarking & Demo (Case Study)

Benchmarking

- NIST Data (US Institute of Standards and Technology)
- GASCALC Software

CTrend Case Study

Fixed speed machine application

Utilities Demonstration

- NACE risk analysis tool
- QHmap tool
- GERG head calculation tool