COMPSYS^{TM} - DYNAMIC SIMULATION SERVICE

OPTIMISATION OF
HOT BY PASS VALVE C$_v$

Mathworks Energy Virtual Conference   25th March 2010   Slide   1 /5
www.sate-italy.com
+39-041-2757634

Hot by pass line

Hot by pass line

FV

V2

HBPV

Hot by pass valve

NRV2

HE

V3

NRV3

SDV3

OUTLET

KS

FT

SD

V1

INLET

SDV1

NRV1

DRIVER
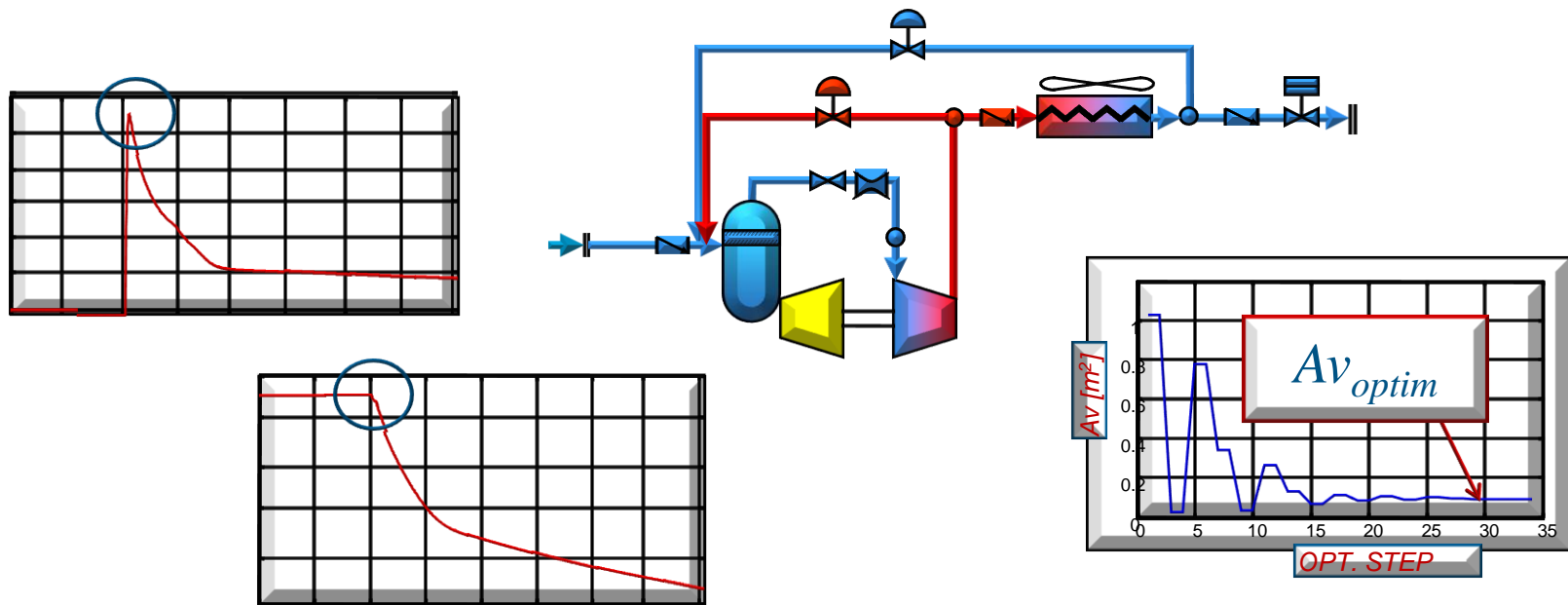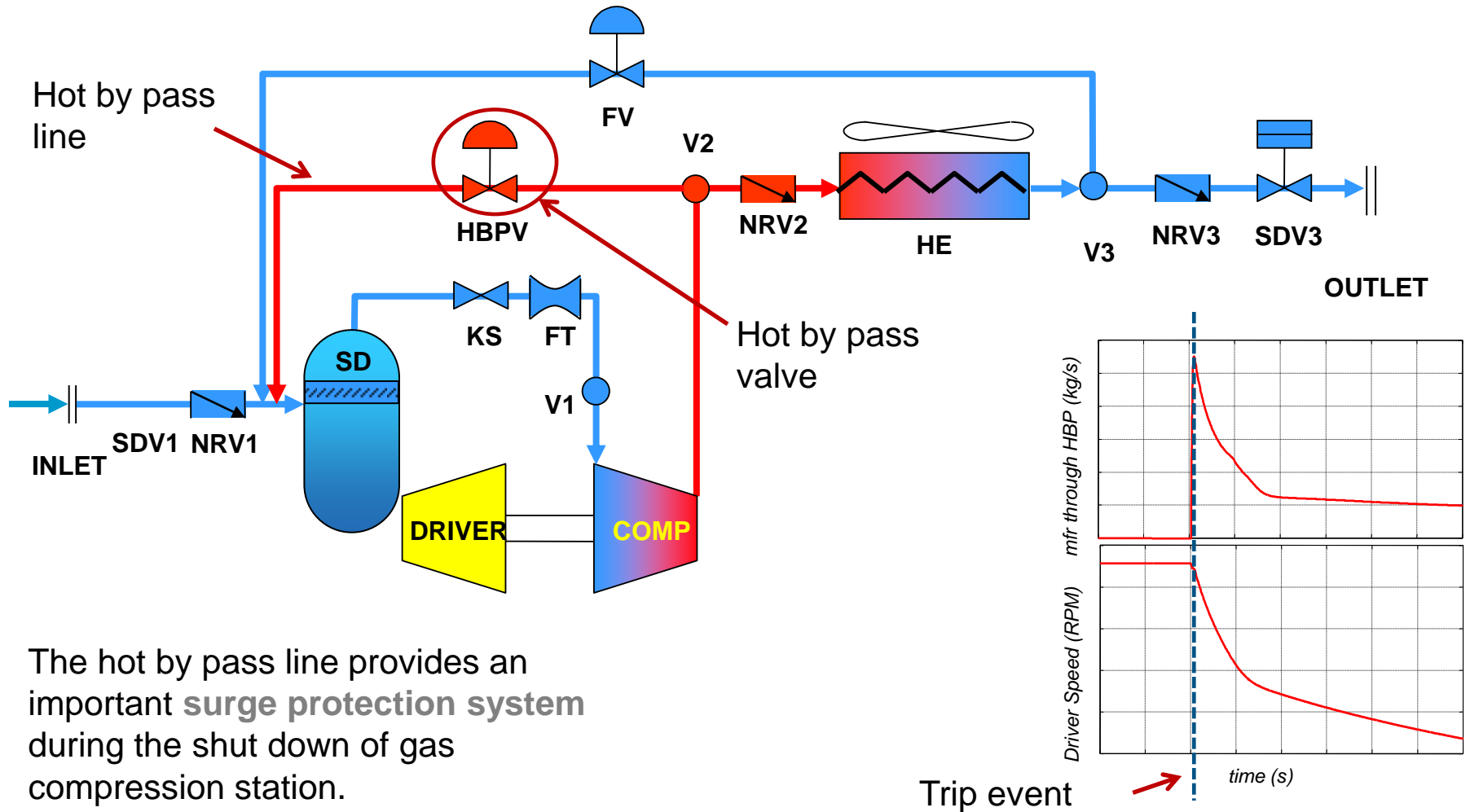
COMP
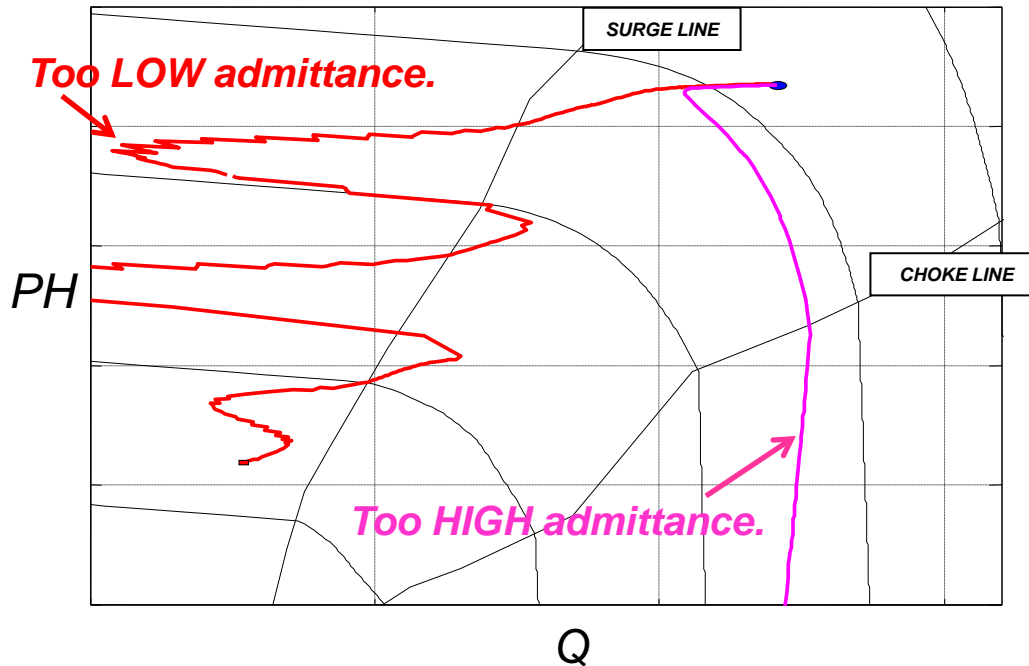
The hot by pass line provides an important **surge protection system** during the shut down of gas compression station.

mfr through HBP (kg/s)

Driver Speed (RPM)

time (s)

Trip event
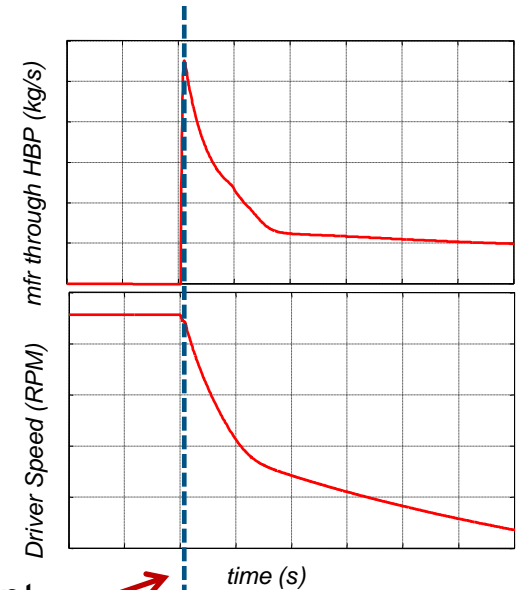
Traditional sizing

The sizing is generally based on the maximum mass flow rate provided by the compressor during normal operating conditions.
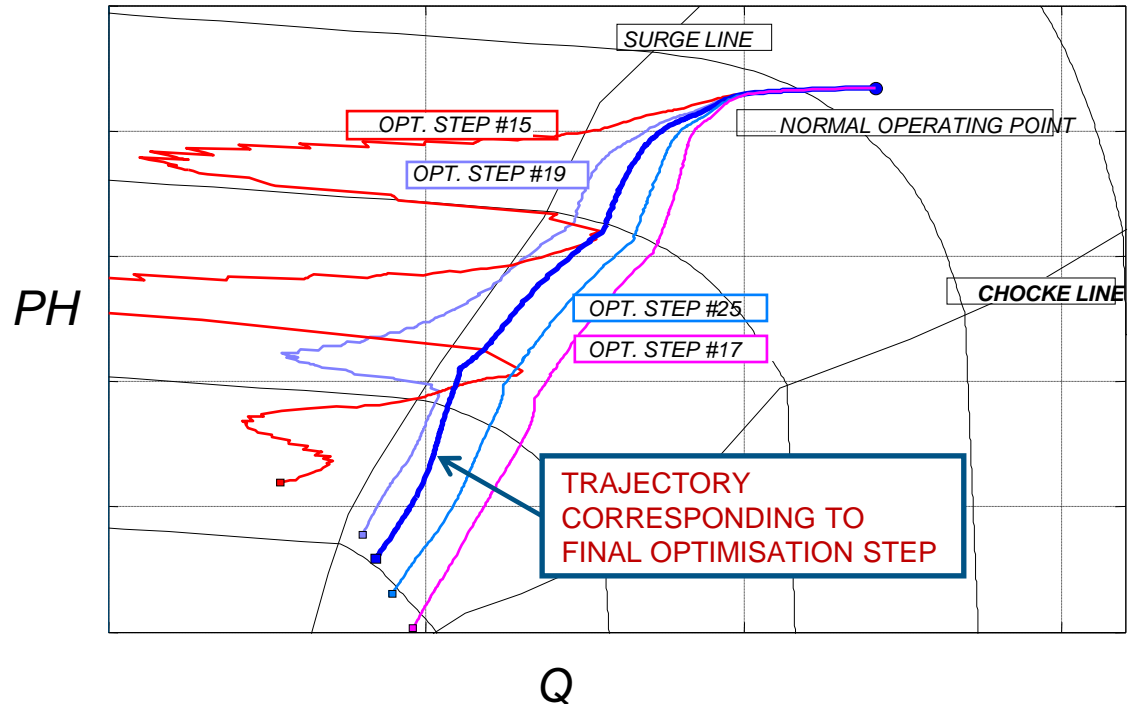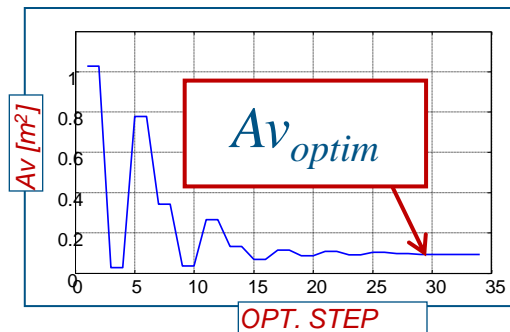

Limits of this approach:

- "static" calculation

- non optimised line admittance

- Neglecting plant dynamic interaction

SATE sizing procedure

Features:

- *optimization* procedure based on *BFGS algorithm*

- considers plant *dynamics*

- applied to the deviation of the simulated *operating point trajectory* from the surge line

PH

SURGE LINE

OPT. STEP #15

NORMAL OPERATING POINT

OPT. STEP #19

CHOCKE LINE

OPT. STEP #25

OPT. STEP #17

TRAJECTORY CORRESPONDING TO FINAL OPTIMISATION STEP

Q

Av_{optim}

Av [m²]

OPT. STEP

Iterative optimization procedure:
Optimum admittance corresponds to the *minimum deviation* of the compressor trajectory from the surge line
→ *ideal valve size*

Links

CLICK ON THE BUTTONS TO VIEW IN GRATER DETAILS

MAIN PRESENTATION

COMPSYS MC™

TGSIM