# Improve DMC and RMPCT Control using PITOPS

Many chemical plants use DMC (Dynamic Matrix Control) and RMPCT (Robust Model Predictive Control Technology. DMC/RMPCT are called MPC (model predictive control). With time, fouling heaters, sticking control valves, sensor re-calibration, process non-linearity and changes in process or economic conditions cause changes in process dynamics followed by deterioration of the DMC/RMPCT systems. Since there are numerous dynamic models in MPC, determining which of the models have changed and how to improve the MPC performance is a big challenge. PiControl is proud to offer PITOPS closed-loop system identification software that can analyze closed-loop data with any MPC active and making slave setpoint moves; and help to pinpoint the erroneous models to improve MPC performance.

Control Oscillations caused by DMC/RMPCT controllers - Headache for the Control Engineer
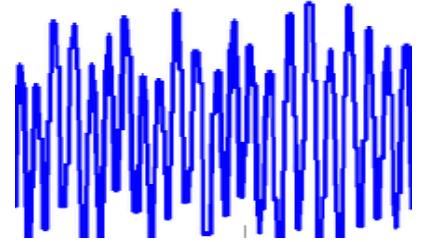
### Distillation MPC Illustration
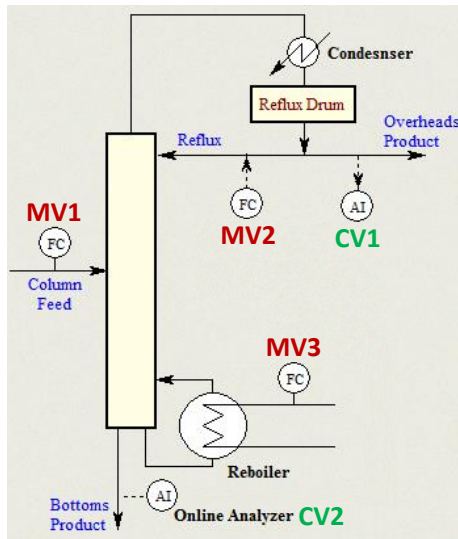
See a simple distillation MPC shown to the left. There can be six dynamic models for the 3MV – 2CV MPC as shown to the right.

What if one or more models are inaccurate and as a result the MPC suffers from excessive prediction error and results in bad oscillations impacting control quality?

PiControl's PITOPS has the unique ability to analyze closed-loop data with the MPCs active (On) and changing the slave PID setpoints. This ability is only unique to PITOPS and not available in any other tool.
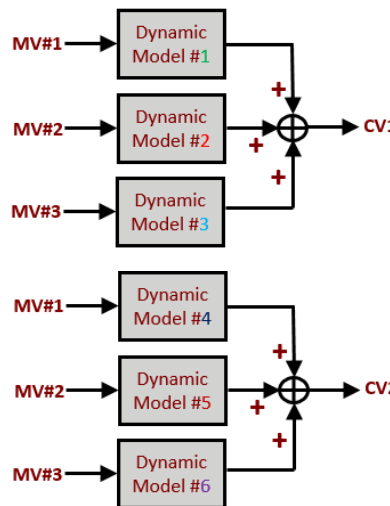
MPC Control Matrix
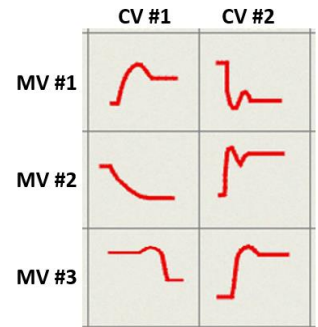
PITOPS Amazing New Functionality

- DMC/RPMCT model improvements
- Design & implement DCS/PLC based APC
- Tune PID Control Loops
- Tune Cascade PIDs
- Tune Constraint Override Control Schemes
- Train new and experienced engineers

PITOPS is an integrated PID, APC, MPC and training solution for both industry and academics.

See the six models shown to the left here. PITOPS helps to identify the real open-loop dynamic models after which PITOPS generates model files containing the new and improved MPC models. This functionality of closed-loop data analysis and open-loop dynamic model identification has been hailed as a processcontrol technological breakthrough and is expected to revolutionize the way MPCs are maintained today. This approach can save a lot of time and help to pinpoint the culprit models.

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