

FCCU Advanced Control at Chevron Pembroke Refinery

ERTC

8th to 10th May 2006

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FCC at Pembroke Refinery

- Initial Hydro skim refinery commissioned in 1967
- Cracking facilities commissioned in 1983
(Texaco side by side Rx/Rg unit, with a main fractionator and gas concentration section)
- Can process over 35% resid of total throughput of over 100,000 BPSD (600m³/hr - One of the Biggest FCC in Europe)
- Feed mix variation is in the region of 0.908 to 0.92 SG
- Last major turn around is during 2003



History of APC at Pembroke

- Pembroke Refinery has a long history of APC since 1987
- First MVC controller on FCC – 1988 (DMC) – with separate controller for Rx/Rg, and Mainfrac
- 2001, RMPCT replaced DMC, retained original structure, and added deeth, debut, napsplit
- Very limited success at each time (mainfrac didn't work, lack of co-ordination between applications, tray damage)
- First Principle Inference first used in early 1990's and have been deployed across most refinery units

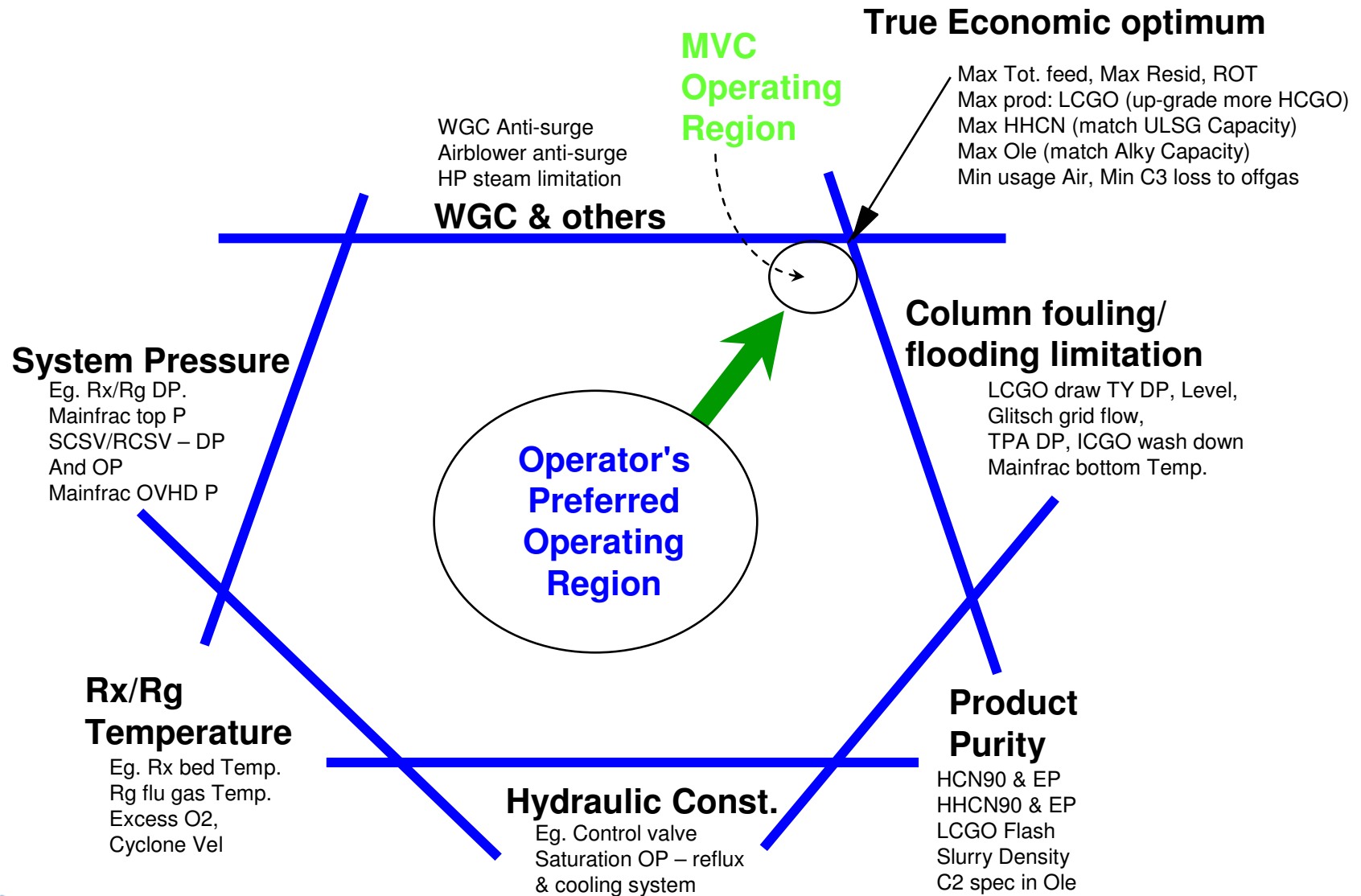


FCCU APC Reengineering

- Potentially US\$ 4millions/yr yet to be captured (carried a study on FCC APC during 2004) - Need to completely revamp FCC APC
- Scope of the revamp to cover reactor, regenerator, mainfrac, deeth, debut
- Main focus of the application and this paper is the Fractionator section due to major difficulties in managing this section of the unit
- Major feed limiting constraints are mainly in the Fractionator section
- RMPCT is the control technology used
- New FCCU application commissioned in July 2005



Operating within Constraints



FCCU application overview

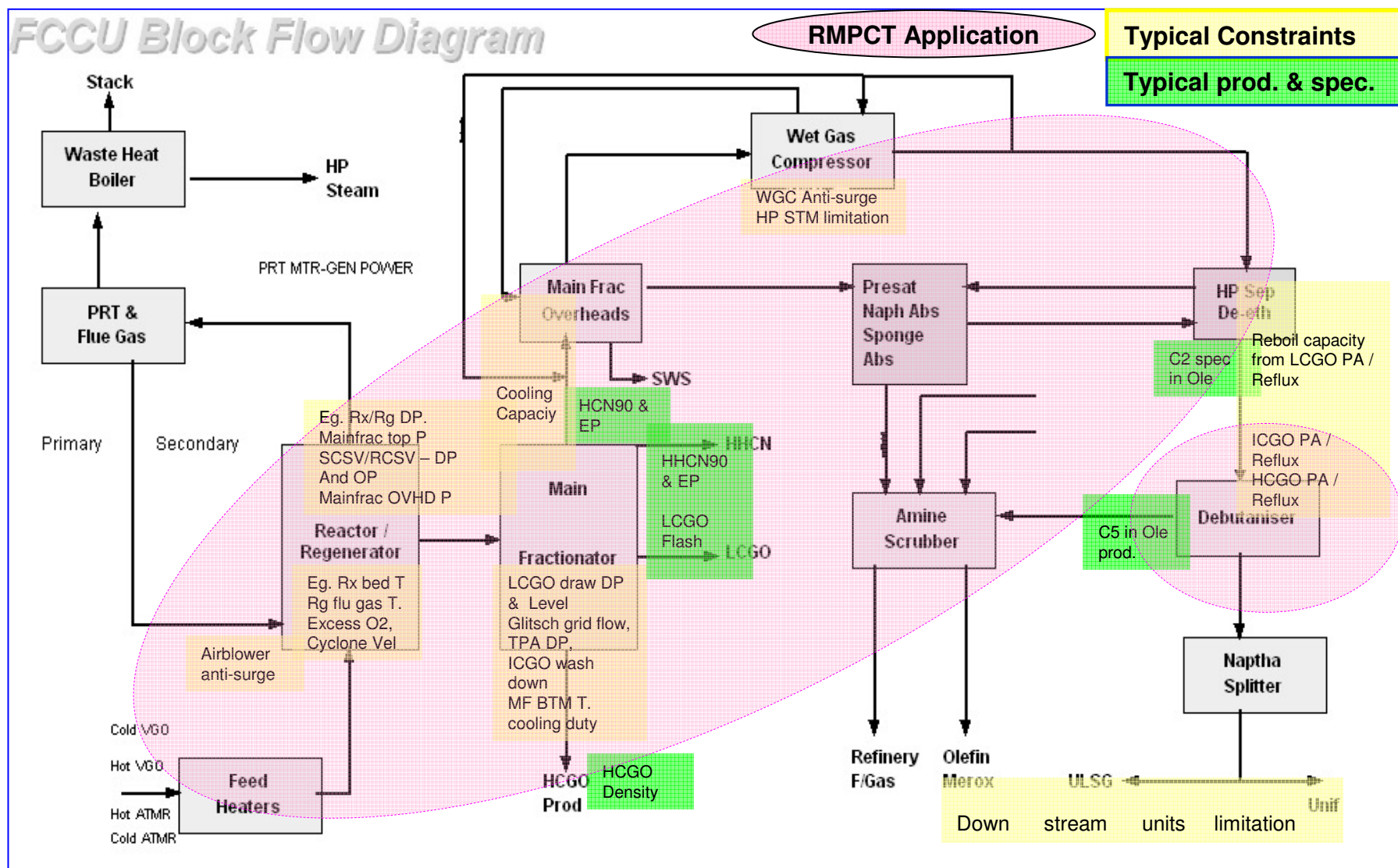
- Applications are as follows:
 - Rx_Rg/mainFrac/Deeth (better integration and optimisation) – 55CVs,22MVs,11DVs
 - Single application to cover Debutaniser (8CVs,4MVs,6DVs)
- Large scope application with sub controllers deployed for ease of maintenance and operator intervention. *(Sub controller switch AM/CL code supplied by AMT)*
- Customised Operator displays developed by CVX and AMT
 - Easy monitoring and operated upon (by panel operators)
 - Accommodation for switching access
- First principle Inferential model based on GCC (Petrocontrol)



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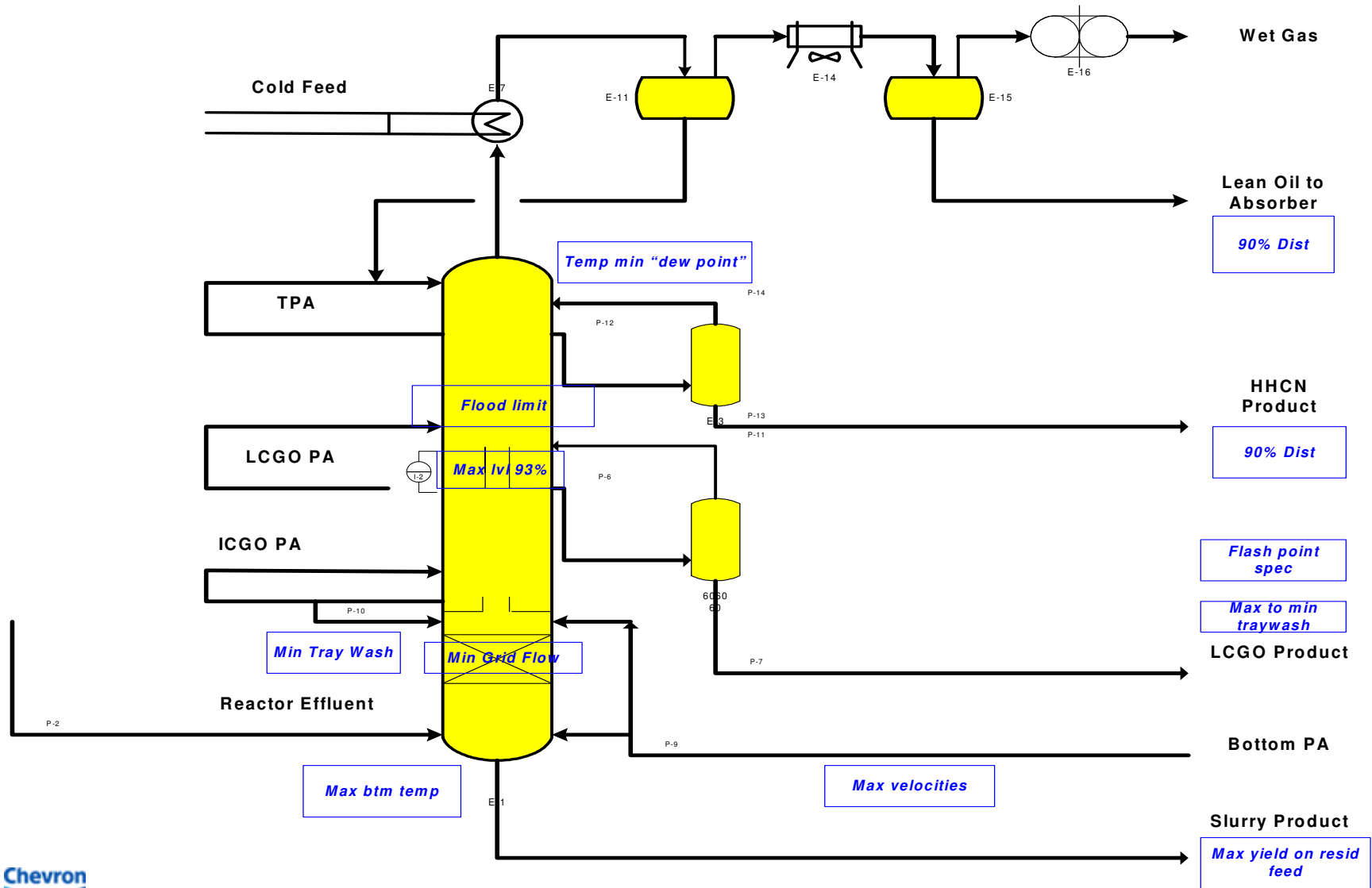
Overview of Revamp Design



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Schematic of Main fractionator



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Project details Schedule and contract

- Project was completed in a 8 month window.
- Inferential model provided by Petrocontrol, and implemented and subsequent re-calibrated by CVX (VBA-model for easy maintaining and calibration)
- APC model jointly developed and implemented by CVX and AMT (one engineer each)
- Operator training package jointly developed by CVX and AMT (computer based self-learning, interactive)
- Project completed under budget with benefits higher than expected



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FCCU APC Application Success Factors

- New FCCU application commissioned in mid-June 2005
- High operator acceptance
- Good average controller uptime (>95% when process available)
- Fractionator control now much improved, this is a key issue for the FCCU unit operations.
- Payback achieved within a month

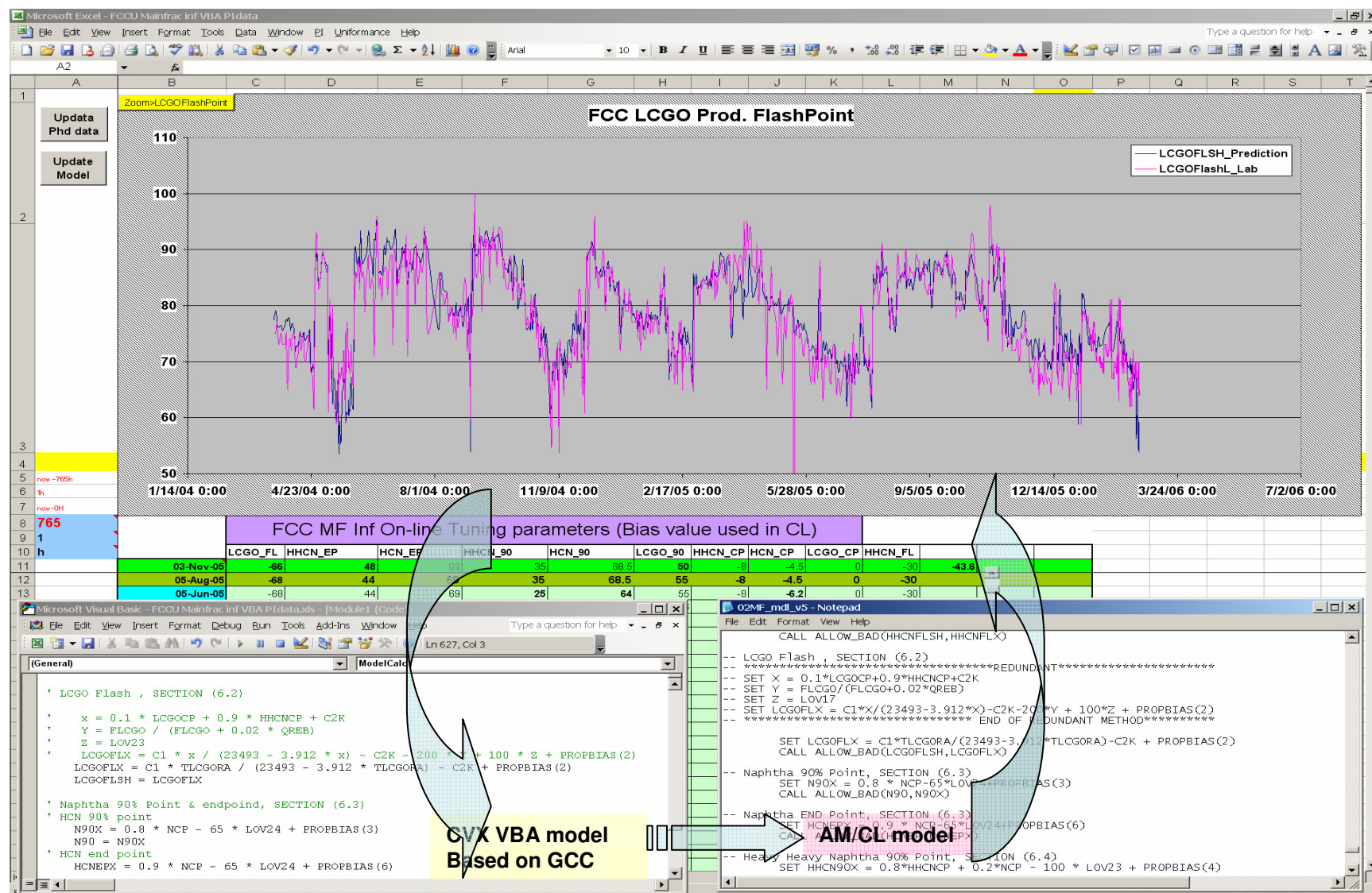


Feature – inferentials/Specs Control

- Fractionator:
 - LCGO Flash Point
 - HHCN ASTM 90% & End point
 - HCN ASTM 90% & End point
- Gas Plant
 - Deeth bottom % C2 slippage
 - Olefin % C5
 - LCN RVP
- ***Note: no analyser or lab updates used for biasing inferences***



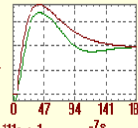
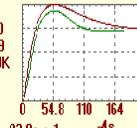
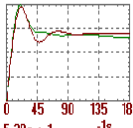
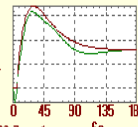
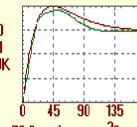
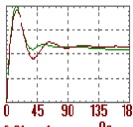
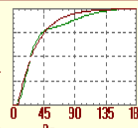
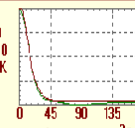
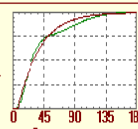
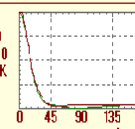
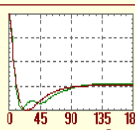
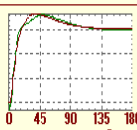
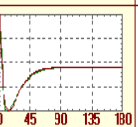
Highlight - Inferential models



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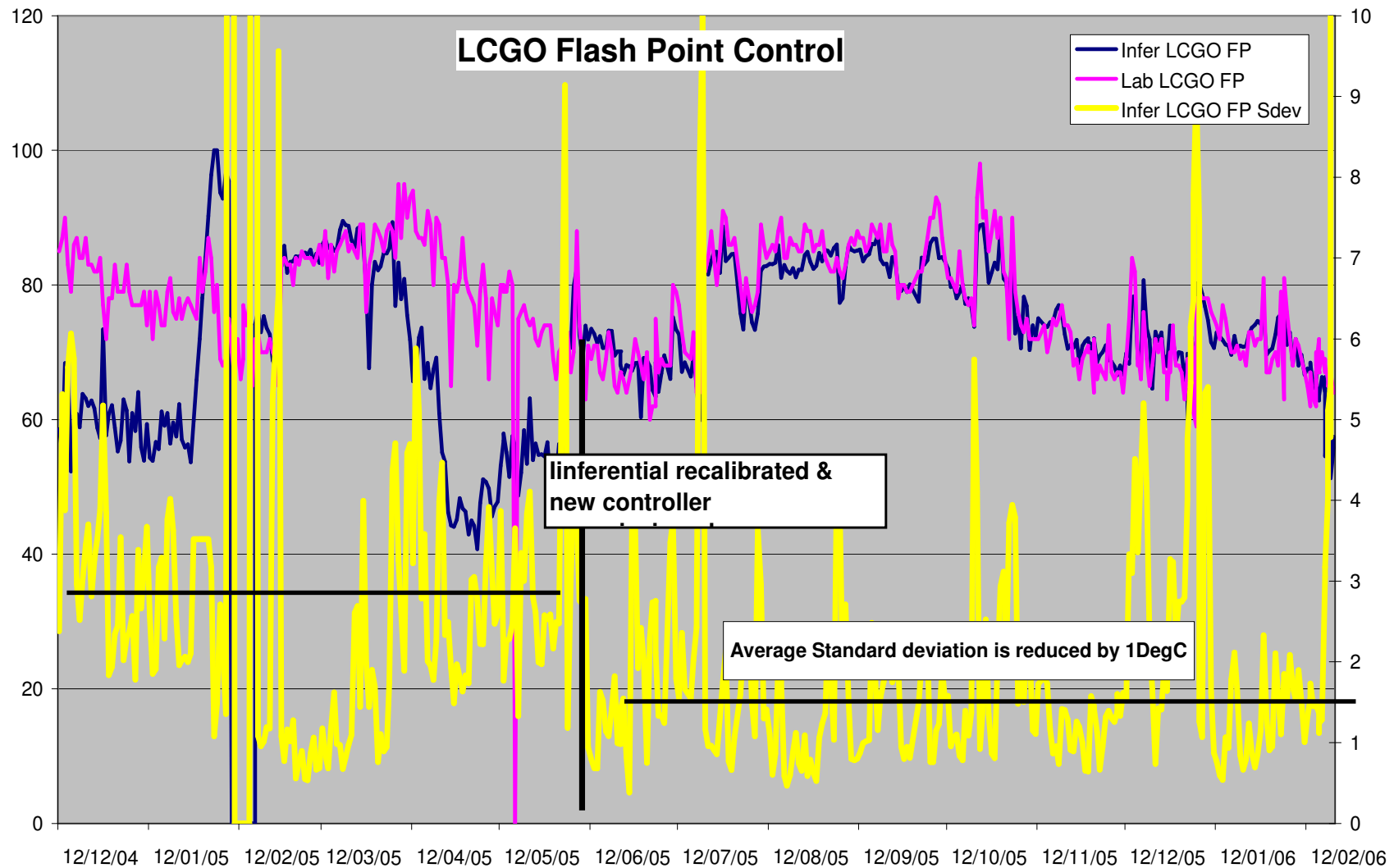
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Sample Model – Spec Control

	MF Top-T	MF OVHD-T	LCGO prod.	HCGO PA	LCGO RBL	Deeth RBL	Ambient-T
HCN pt90	<div>Lap Order 2 Settle T = 180 TFSettle = 188 FIR Form = UK Trial 1</div>  <div>$G(s) = -.3 \frac{111s + 1}{637s^2 + 50.5s + 1} e^{-7s}$</div>	<div>Lap Order 2 Settle T = 180 TFSettle = 219 FIR Form = UK Trial 1</div>  <div>$G(s) = .55 \frac{93.8s + 1}{1157s^2 + 68s + 1} e^{-4s}$</div>					<div>APX Order 2 Settle T = 180 TFSettle = 86.0 FIR Form = UK Trial 1</div>  <div>$G(s) = .164 \frac{5.39s + 1}{63.7s^2 + 5.55s + 1} e^{-1s}$</div>
HCN EP	<div>Lap Order 2 Settle T = 180 TFSettle = 148 FIR Form = UK Trial 1</div>  <div>$G(s) = -.3 \frac{95.7s + 1}{371s^2 + 38.5s + 1} e^{-6s}$</div>	<div>Lap Order 2 Settle T = 180 TFSettle = 171 FIR Form = UK Trial 1</div>  <div>$G(s) = .55 \frac{72.6s + 1}{721s^2 + 53.7s + 1} e^{-2s}$</div>					<div>APX Order 2 Settle T = 180 TFSettle = 94.0 FIR Form = UK Trial 1</div>  <div>$G(s) = .165 \frac{8.91s + 1}{52.3s^2 + 4.71s + 1} e^{-0s}$</div>
HHCN 90pt	<div>Lap Order 1 Settle T = 180 TFSettle = 117 FIR Form = UK Trial 1</div>  <div>$G(s) = 1.4 \frac{1}{27.1s + 1} e^{-9s}$</div>		<div>Lap Order 2 Settle T = 180 TFSettle = 46.0 FIR Form = UK Trial 1</div>  <div>$G(s) = -.088 \frac{1}{50.5s^2 + 14.2s + 1} e^{-3s}$</div>				
HHCN EP	<div>Lap Order 1 Settle T = 180 TFSettle = 132 FIR Form = UK Trial 1</div>  <div>$G(s) = 1.4 \frac{1}{31s + 1} e^{-8s}$</div>		<div>Lap Order 2 Settle T = 180 TFSettle = 50.0 FIR Form = UK Trial 1</div>  <div>$G(s) = -.088 \frac{3.64s + 1}{104s^2 + 16.6s + 1} e^{-4s}$</div>				
LCGO FP			<div>Lap Order 2 Settle T = 180 TFSettle = 96.0 FIR Form = UK Trial 1</div>  <div>$G(s) = -.176 \frac{40.3s + 1}{223s^2 + 29.8s + 1} e^{-2s}$</div>		<div>Lap Order 2 Settle T = 180 TFSettle = 122 FIR Form = UK Trial 1</div>  <div>$G(s) = .0392 \frac{45.5s + 1}{410s^2 + 40.5s + 1} e^{-3s}$</div>		
Deeth Bottom C2						<div>Lap Order 2 Settle T = 180 TFSettle = 74.0 FIR Form = UK Trial 1</div>  <div>$G(s) = -.0284 \frac{42.1s + 1}{106s^2 + 20.6s + 1} e^{-1s}$</div>	



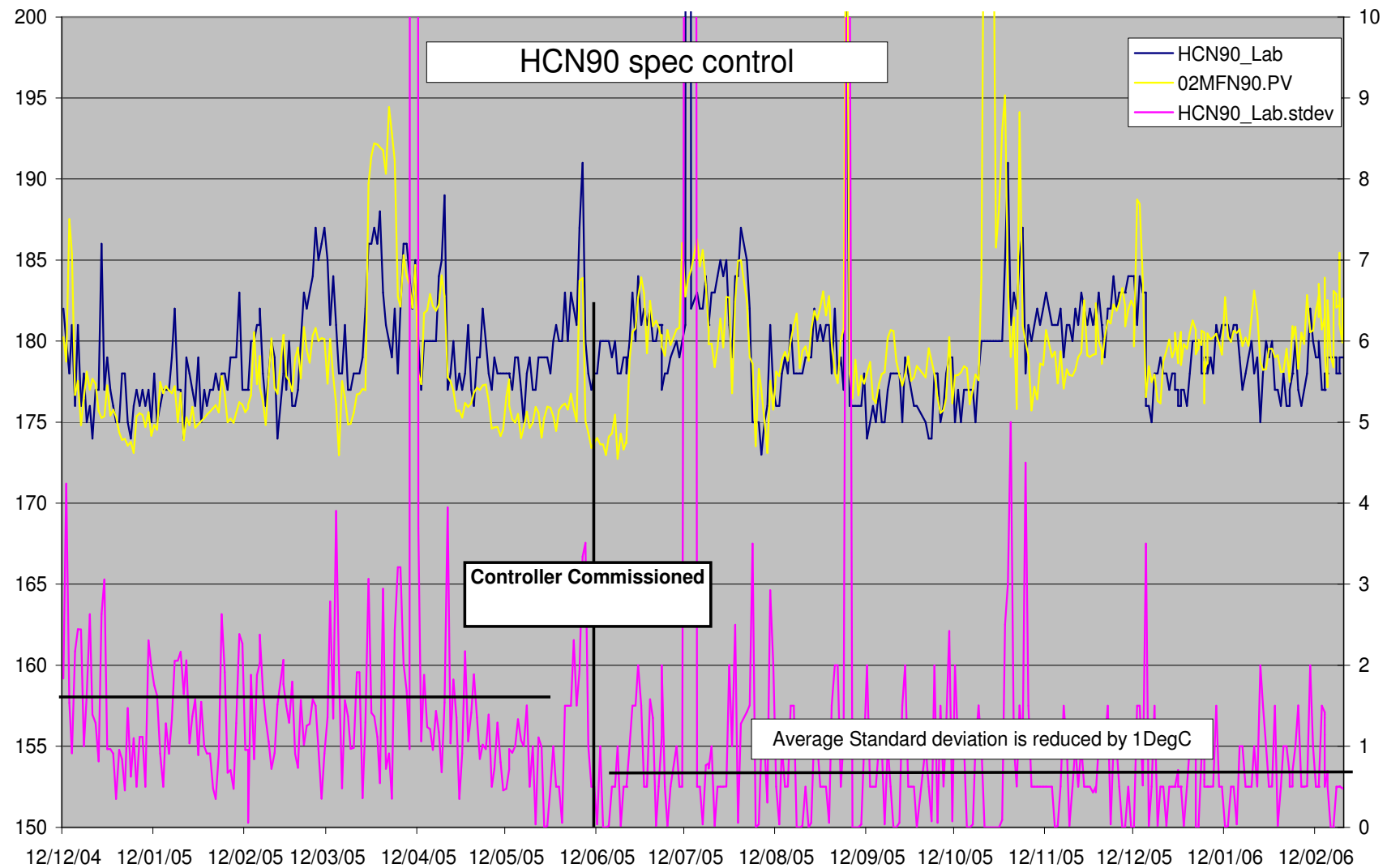
Highlight - LCGO Flash Point control



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Highlight – HCN90 spec control



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Feature – mainfrac control

- Optimise where possible the Fract bottoms heat removal
Control Fractionator bottom temperature
- Prevent Fractionator flooding
- Maximise heat removal and balance duty around the column
- Ensure column packed sections are kept wet
- Ensure Slurry oil density remain on control within tight limits
- Minimise fouling probabilities in Slurry system
- Sustains Debutaniser on control even though reboiler (HCGO) exchanger fouling occurs



Sample Model – Main Frac control

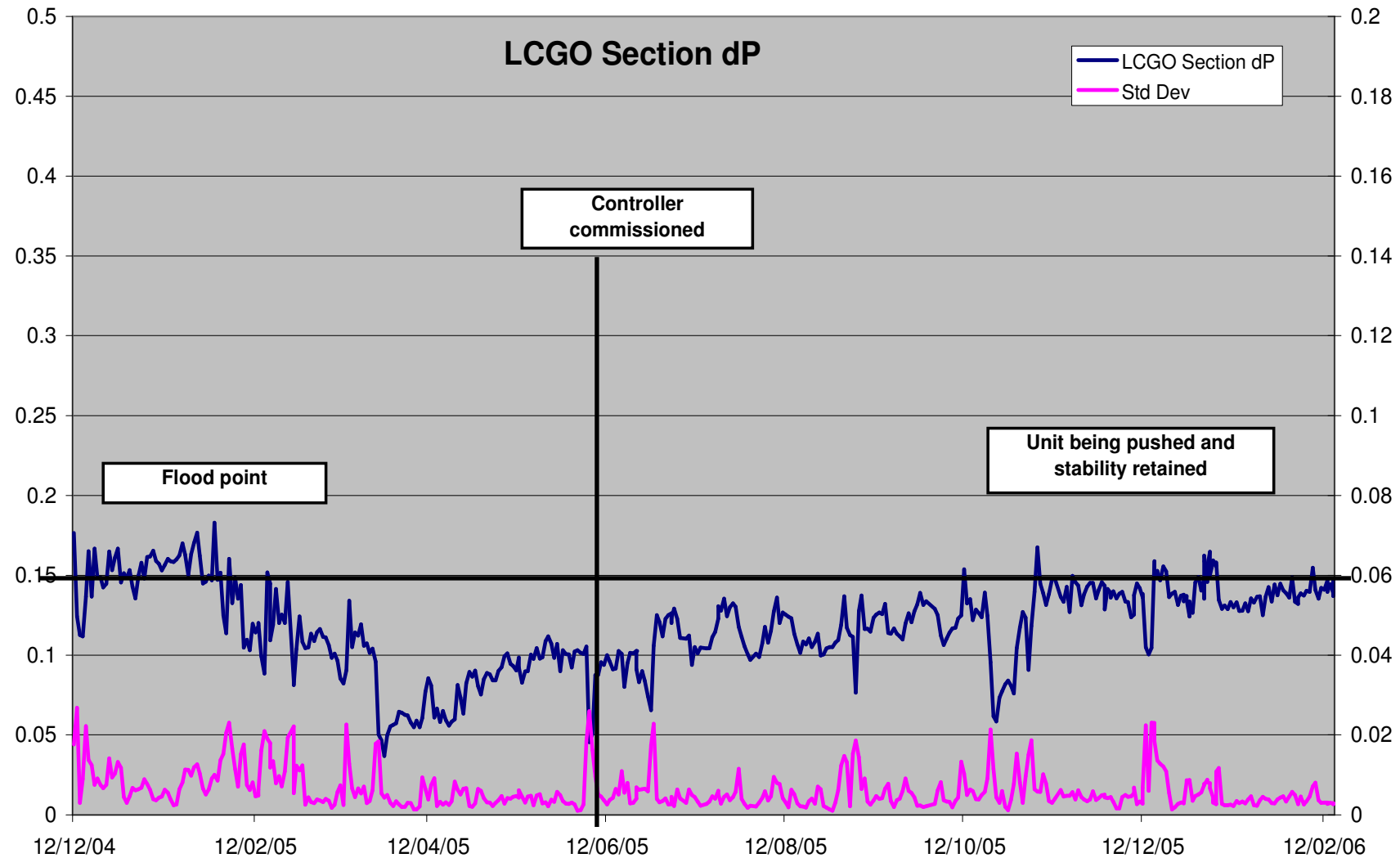
	Feed	ROT	MF Top-T	LCGO prod.	HCGO PA	ICGO PA	HHCN prod
MainFrac	Lap Order 2 Settle T = 180 TFSettle = 82.0 FIR Form = UK Trial 1 $G(s) = \frac{.06}{53.8s^2 + 4.67s + 1} e^{-1.32s}$	Lap Order 2 Settle T = 180 TFSettle = 15.0 FIR Form = UK Trial 1 $G(s) = \frac{.3}{5.66s^2 + 4.76s + 1} e^{-.745s}$					
Bottom Temp.							
Packed Section	ARX Order 2 Settle T = 180 TFSettle = 68.0 FIR Form = UK Trial 1 $G(s) = \frac{.76}{130s^2 + 23.7s + 1} e^{-8.7s}$	Lap Order 1 Settle T = 180 TFSettle = 34.0 FIR Form = UK Trial 1 $G(s) = \frac{1}{8s + 1} e^{-1.4s}$		Lap Order 2 Settle T = 180 TFSettle = 228 FIR Form = UK Trial 1 $G(s) = \frac{-1}{338s^2 + 68.7s + 1} e^{-30s}$	Lap Order 2 Settle T = 180 TFSettle = 27.0 FIR Form = UK Trial 1 $G(s) = \frac{1}{28.9s^2 + 7.88s + 1} e^{-8.96s}$		
ICGO Wash	Lap Order 2 Settle T = 180 TFSettle = 45.0 FIR Form = UK Trial 1 $G(s) = \frac{.05}{39.5s^2 + 8.53s + 1} e^{-.4s}$	Lap Order 2 Settle T = 180 TFSettle = 45.0 FIR Form = UK Trial 1 $G(s) = \frac{-914}{33.6s^2 + 6.53s + 1} e^{-15.9s}$	Lap Order 2 Settle T = 180 TFSettle = 77.0 FIR Form = UK Trial 1 $G(s) = \frac{-1}{81.8s^2 + 8.87s + 1} e^{-3.2s}$	Lap Order 2 Settle T = 180 TFSettle = 163 FIR Form = UK Trial 1 $G(s) = \frac{-1}{120s^2 + 26.1s + 1} e^{-13.8s}$	Lap Order 2 Settle T = 180 TFSettle = 75.0 FIR Form = UK Trial 1 $G(s) = \frac{-3}{265s^2 + 33.8s + 1} e^{-17s}$		Lap Order 2 Settle T = 180 TFSettle = 85.0 FIR Form = UK Trial 1 $G(s) = \frac{-1}{190s^2 + 36s + 1} e^{-23.3s}$
LCGO Draw LVL	Lap Order 1 Settle T = 180 TFSettle = 70.0 FIR Form = UK Trial 1 $G(s) = \frac{1}{16.7s + 1} e^{-3s}$	Lap Order 2 Settle T = 180 TFSettle = 102 FIR Form = UK Trial 1 $G(s) = \frac{.2}{201s^2 + 28.4s + 1} e^{-64s}$	Lap Order 2 Settle T = 180 TFSettle = 57.0 FIR Form = UK Trial 1 $G(s) = \frac{-2}{121s^2 + 16.5s + 1} e^{-3.33s}$	Lap Order 1 Settle T = 180 TFSettle = 163 FIR Form = UK Trial 1 $G(s) = \frac{1}{40s + 1} e^{-2s}$	Lap Order 2 Settle T = 180 TFSettle = 49.0 FIR Form = UK Trial 1 $G(s) = \frac{-0.04}{51s^2 + 15.1s + 1} e^{-51s}$	Lap Order 2 Settle T = 180 TFSettle = 115 FIR Form = UK Trial 1 $G(s) = \frac{-0.0601}{409s^2 + 46.6s + 1} e^{-24s}$	Lap Order 1 Settle T = 180 TFSettle = 136 FIR Form = UK Trial 1 $G(s) = \frac{1}{33.6s + 1} e^{-1.89s}$
LCGO Draw DP	Lap Order 2 Settle T = 180 TFSettle = 80.0 FIR Form = UK Trial 1 $G(s) = \frac{.0006}{248s^2 + 47.5s + 1} e^{-37.3s}$	Lap Order 2 Settle T = 180 TFSettle = 92.0 FIR Form = UK Trial 1 $G(s) = \frac{.00069}{139s^2 + 23.6s + 1} e^{-75.8s}$	Lap Order 2 Settle T = 180 TFSettle = 122 FIR Form = UK Trial 1 $G(s) = \frac{.06}{507s^2 + 45s + 1} e^{-43.5s}$	Lap Order 2 Settle T = 180 TFSettle = 159 FIR Form = UK Trial 1 $G(s) = \frac{1}{38.4s + 1} e^{-.0012s}$	Lap Order 2 Settle T = 180 TFSettle = 70.0 FIR Form = UK Trial 1 $G(s) = \frac{-0.0002}{29s^2 + 7.39s + 1} e^{-32s}$	ARX Order 2 Settle T = 180 TFSettle = 133 FIR Form = UK Trial 1 $G(s) = \frac{-0.0001}{157s^2 + 48.5s + 1} e^{-31.5s}$	Lap Order 1 Settle T = 180 TFSettle = 141 FIR Form = UK Trial 1 $G(s) = \frac{1}{34.4s + 1} e^{-.000512s}$
HCGO Visc	Lap Order 2 Settle T = 180 TFSettle = 76.0 FIR Form = UK Trial 1 $G(s) = \frac{.03}{112s^2 + 15.6s + 1} e^{-4.1s}$	Lap Order 2 Settle T = 180 TFSettle = 27.0 FIR Form = UK Trial 1 $G(s) = \frac{.1}{18.5s^2 + 8.85s + 1} e^{-18.5s}$	Lap Order 2 Settle T = 180 TFSettle = 122 FIR Form = UK Trial 1 $G(s) = \frac{.06}{507s^2 + 45s + 1} e^{-43.5s}$	Lap Order 2 Settle T = 180 TFSettle = 80.0 FIR Form = UK Trial 1 $G(s) = \frac{.03}{429s^2 + 35.5s + 1} e^{-15.5s}$	Lap Order 2 Settle T = 180 TFSettle = 70.0 FIR Form = UK Trial 1 $G(s) = \frac{.02}{130s^2 + 23.1s + 1} e^{-130s}$		ARX Order 2 Settle T = 240 TFSettle = 81.0 FIR Form = UK Trial 1 $G(s) = \frac{.0299}{440s^2 + 37.2s + 1} e^{-16.1s}$
HCGO Density	Lap Order 2 Settle T = 180 TFSettle = 86.0 FIR Form = UK Trial 1 $G(s) = \frac{.09}{145s^2 + 17.8s + 1} e^{-7.8s}$	Lap Order 2 Settle T = 180 TFSettle = 29.0 FIR Form = UK Trial 1 $G(s) = \frac{.3}{21s^2 + 6.66s + 1} e^{-.224s}$	Lap Order 2 Settle T = 180 TFSettle = 52.0 FIR Form = UK Trial 1 $G(s) = \frac{.18}{120s^2 + 21.9s + 1} e^{-22.4s}$	Lap Order 2 Settle T = 180 TFSettle = 60.0 FIR Form = UK Trial 1 $G(s) = \frac{.09}{118s^2 + 21.8s + 1} e^{-118s}$	Lap Order 2 Settle T = 180 TFSettle = 60.0 FIR Form = UK Trial 1 $G(s) = \frac{.06}{100s^2 + 20s + 1} e^{-100s}$		Lap Order 2 Settle T = 240 TFSettle = 72.0 FIR Form = UK Trial 1 $G(s) = \frac{.0906}{117s^2 + 21.6s + 1} e^{-117s}$



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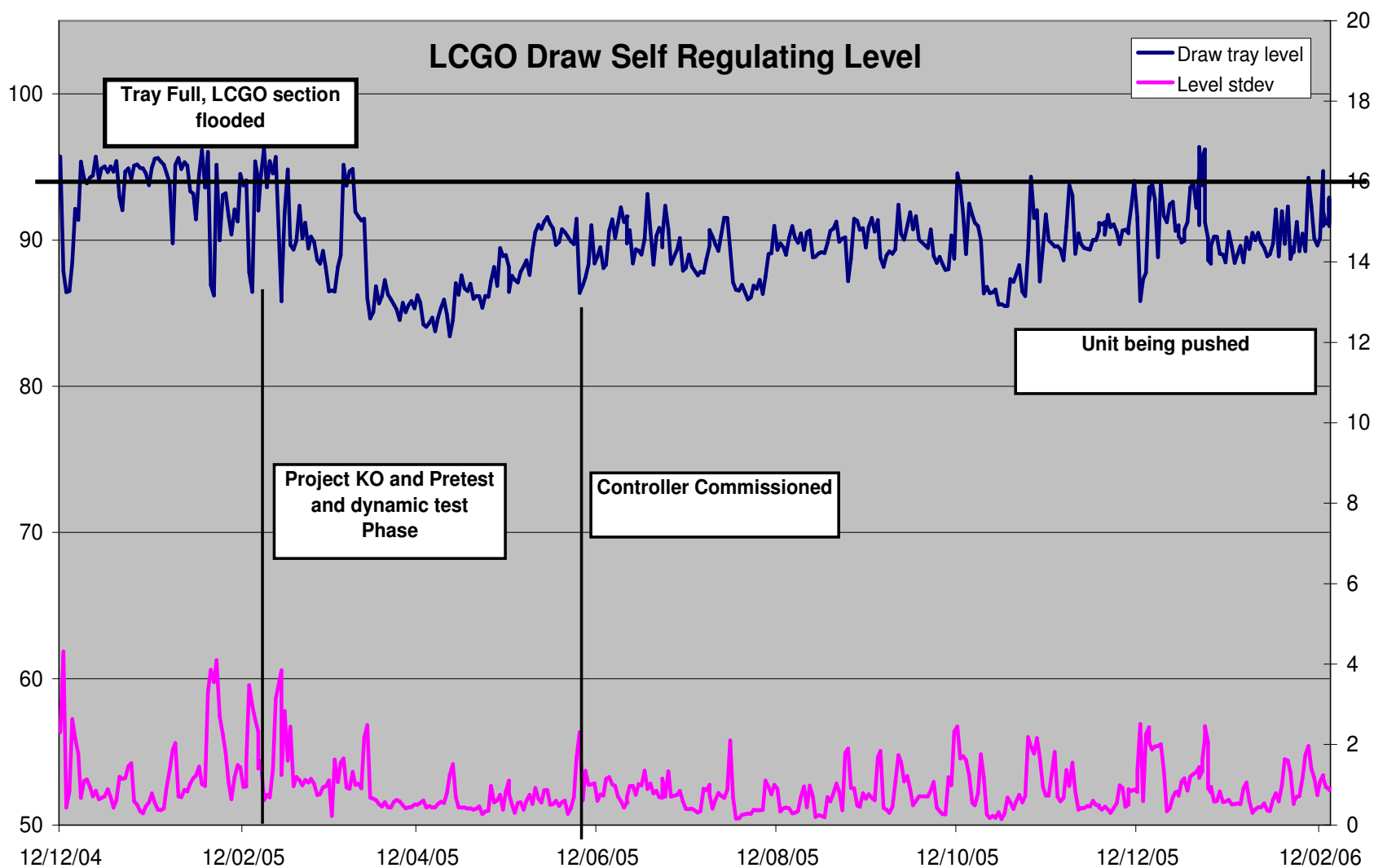
Highlight - LCGO Section dP Sensitivity to Flood



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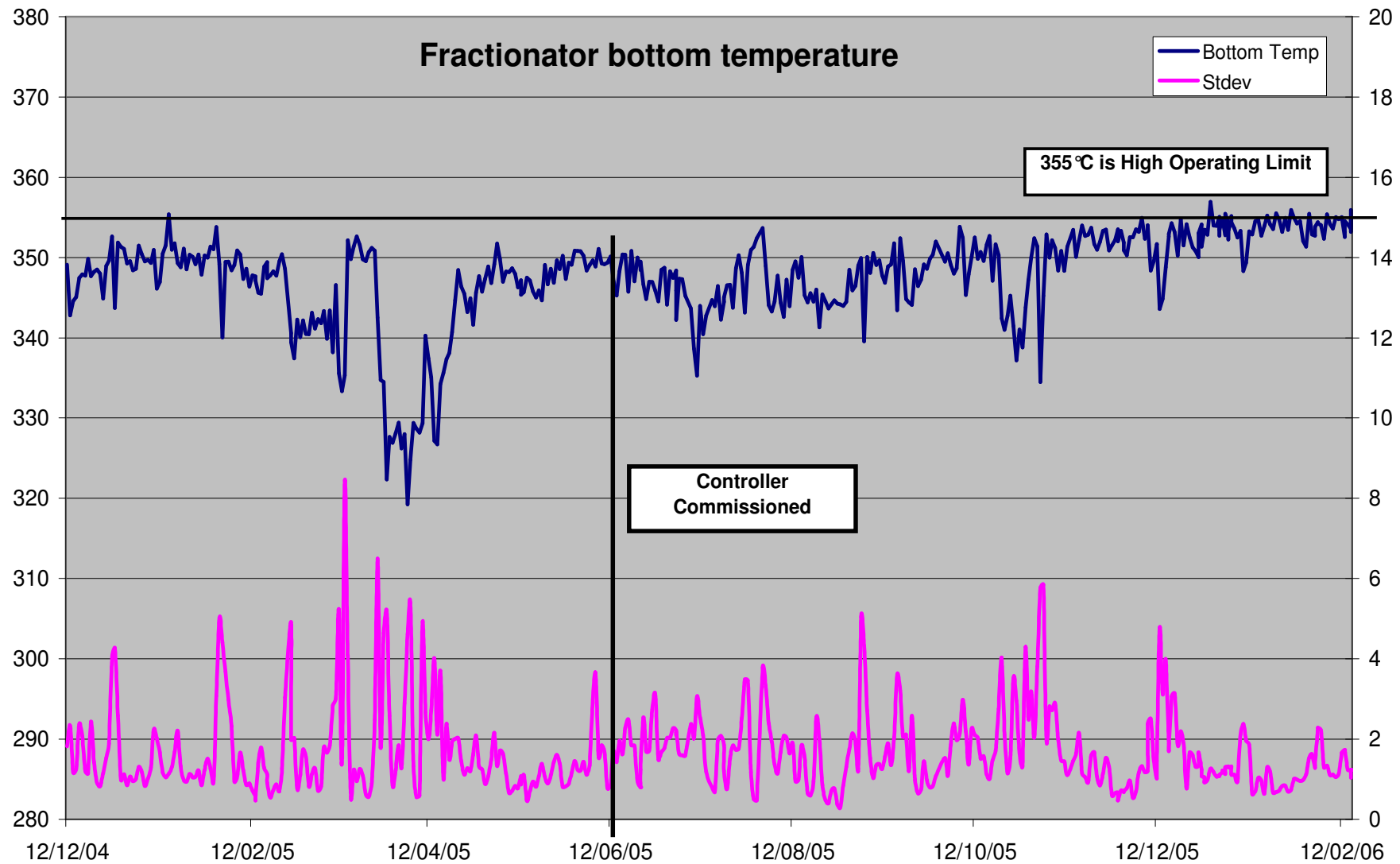
Highlight - LCGO Draw Tray Level



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Highlight - Fractionator BTM T Critical Unit limitation



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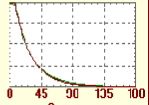


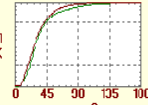
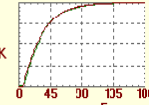
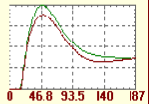
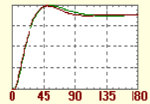
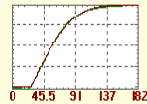
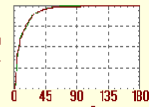
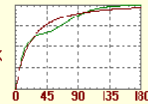
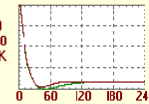
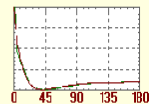
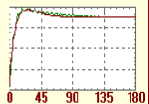
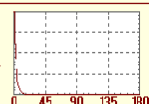
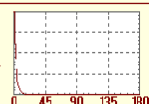
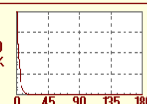
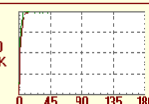


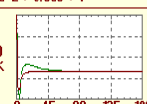

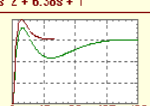
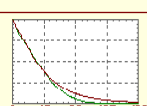
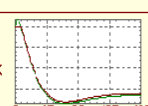
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Feature – Optimisation direction

- Maximise Total Feed (match scheduling)
- Max Resid processing to Regen limitations
- Minimise load on Blower and expander
- Stay in safe system delta P range (slide valves)
 - max cat circulation
- Maximise Conversion
- Run to minimum Regen excess O₂ (>1%)
- Max LCGO draw against MIN internal reflux
 - Significant operator issue
- Minimises the Deethaniser C3's loss to offgas subject to C₂ content at bottom (ole prod)



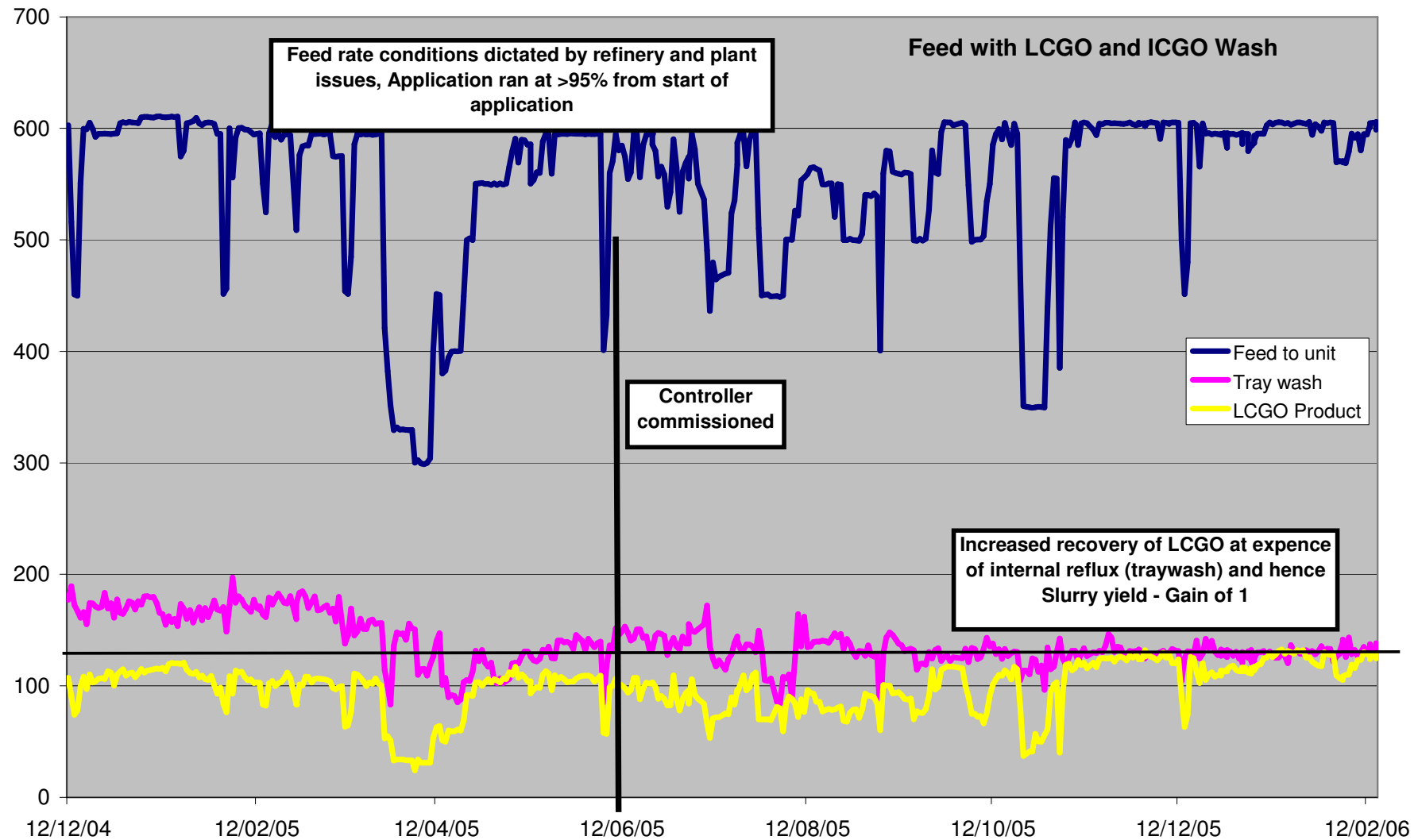
Sample Model – Rx/Rg optimisation

	Tot-Feed	Reactor-Temp	Resid-Feed	Rx/Rg-DP	Feed-Preheat	MF Top-P	Air-blower
Excess O2	<div>Lap Order 1 Settle T = 180 TfSettle = 102 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.03}{23.3s + 1} e^{-8s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 100 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.0894}{109s^2 + 29.6s + 1} e^{-5s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 98.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.005}{355s^2 + 33.1s + 1} e^{-21s}$</div>		<div>Lap Order 2 Settle T = 180 TfSettle = 86.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.03}{140s^2 + 25s + 1} e^{-8s}$</div>		<div>Lap Order 2 Settle T = 180 TfSettle = 100 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.05}{94.2s^2 + 29s + 1} e^{-5s}$</div>
Rx bed Temp	<div>Lap Order 2 Settle T = 180 TfSettle = 187 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.0253}{495s^2 + 26.7s + 1} e^{-17s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 82.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.768}{200s^2 + 17.3s + 1} e^{-6s}$</div>	<div>ARX Order 2 Settle T = 180 TfSettle = 182 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.217}{925s^2 + 48.1s + 1} e^{-28s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 54.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{1}{31.3s^2 + 16.2s + 1} e^{-2s}$</div>	<div>ARX Order 2 Settle T = 180 TfSettle = 178 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.0779}{844s^2 + 71.3s + 1} e^{-1s}$</div>		<div>Lap Order 2 Settle T = 240 TfSettle = 72.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.2}{177s^2 + 20.1s + 1} e^{-3s}$</div>
RCSV DP				<div>Lap Order 2 Settle T = 180 TfSettle = 105 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.35}{382s^2 + 39.1s + 1} e^{-0s}$</div>			
RCSV OP	<div>Lap Order 2 Settle T = 180 TfSettle = 66.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.0651}{149s^2 + 24.4s + 1} e^{-0s}$</div>			<div>Lap Order 2 Settle T = 180 TfSettle = 14.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-1}{10.8s^2 + 6.59s + 1} e^{-1s}$</div>			
Airblow Anti-srg				<div>ARX Order 2 Settle T = 180 TfSettle = 14.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-1}{10.8s^2 + 6.59s + 1} e^{-1s}$</div>		<div>ARX Order 2 Settle T = 180 TfSettle = 14.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-1}{10.8s^2 + 6.59s + 1} e^{-1s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 11.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{0.01477}{.676s^2 + 2.8s + 1} e^{-0s}$</div>
WGC Anti-srg	<div>Lap Order 2 Settle T = 180 TfSettle = 16.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-.0025}{5.78s^2 + 4.96s + 1} e^{-0s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 17.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-.02}{10.2s^2 + 6.38s + 1} e^{-0s}$</div>				<div>Lap Order 2 Settle T = 180 TfSettle = 14.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.51}{4.47s^2 + 4.23s + 1} e^{-0s}$</div>	
Cat. Circ.	<div>Lap Order 2 Settle T = 180 TfSettle = 57.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.0778}{19.7s + 1} e^{-2s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 43.0 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{.31}{16.5s + 1} e^{-3s}$</div>	<div>Lap Order 2 Settle T = 180 TfSettle = 158 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-.055}{456s^2 + 49.2s + 1} e^{-0s}$</div>		<div>Lap Order 2 Settle T = 180 TfSettle = 129 FIR Form = UK Trial 1</div>  <div>$G(s) = \frac{-0.1}{544s^2 + 34s + 1} e^{-10s}$</div>		



Unit Feed and Yields in M3/HR

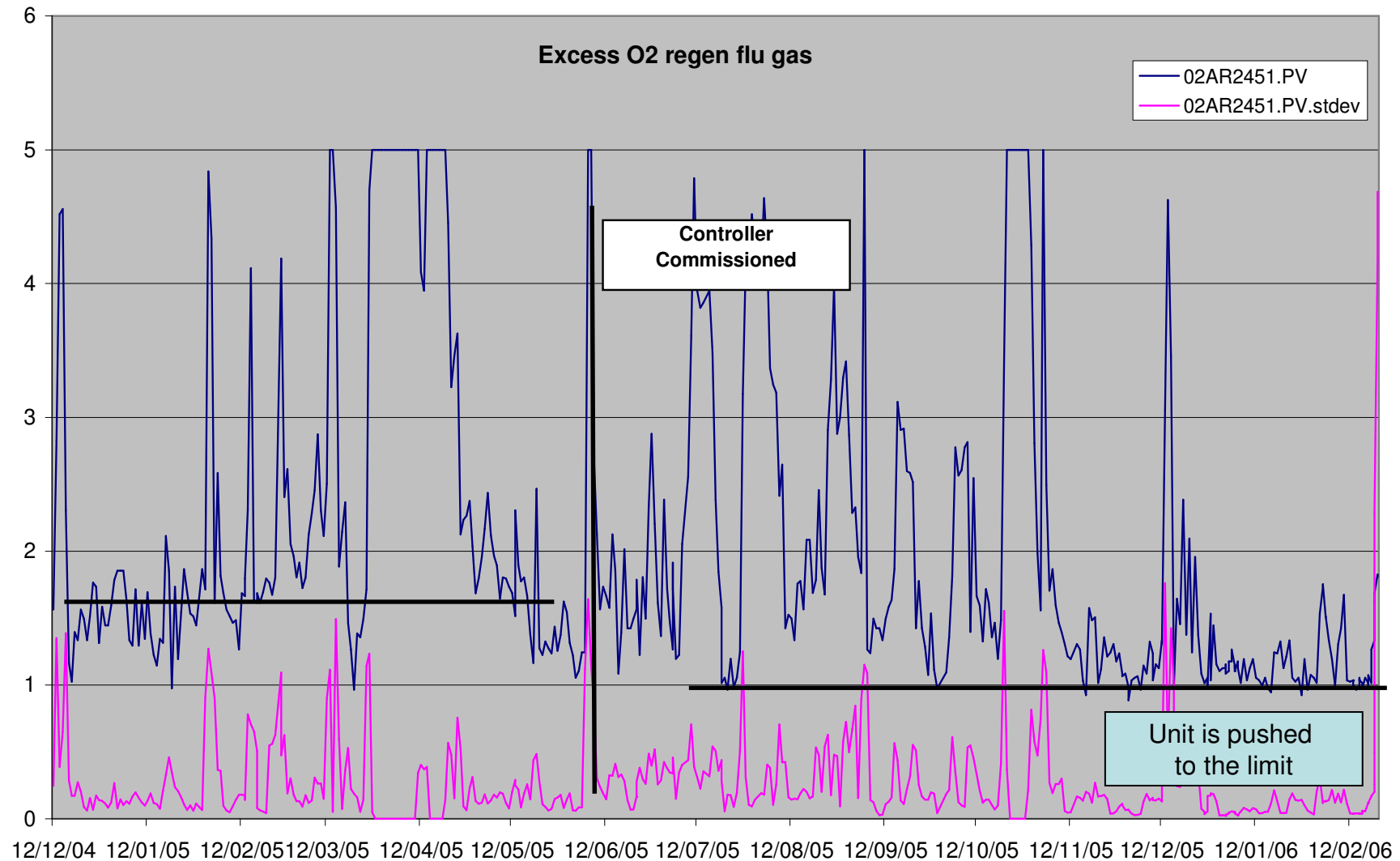
Shows increase in recovery of LCGO whilst sustaining bottom conditions



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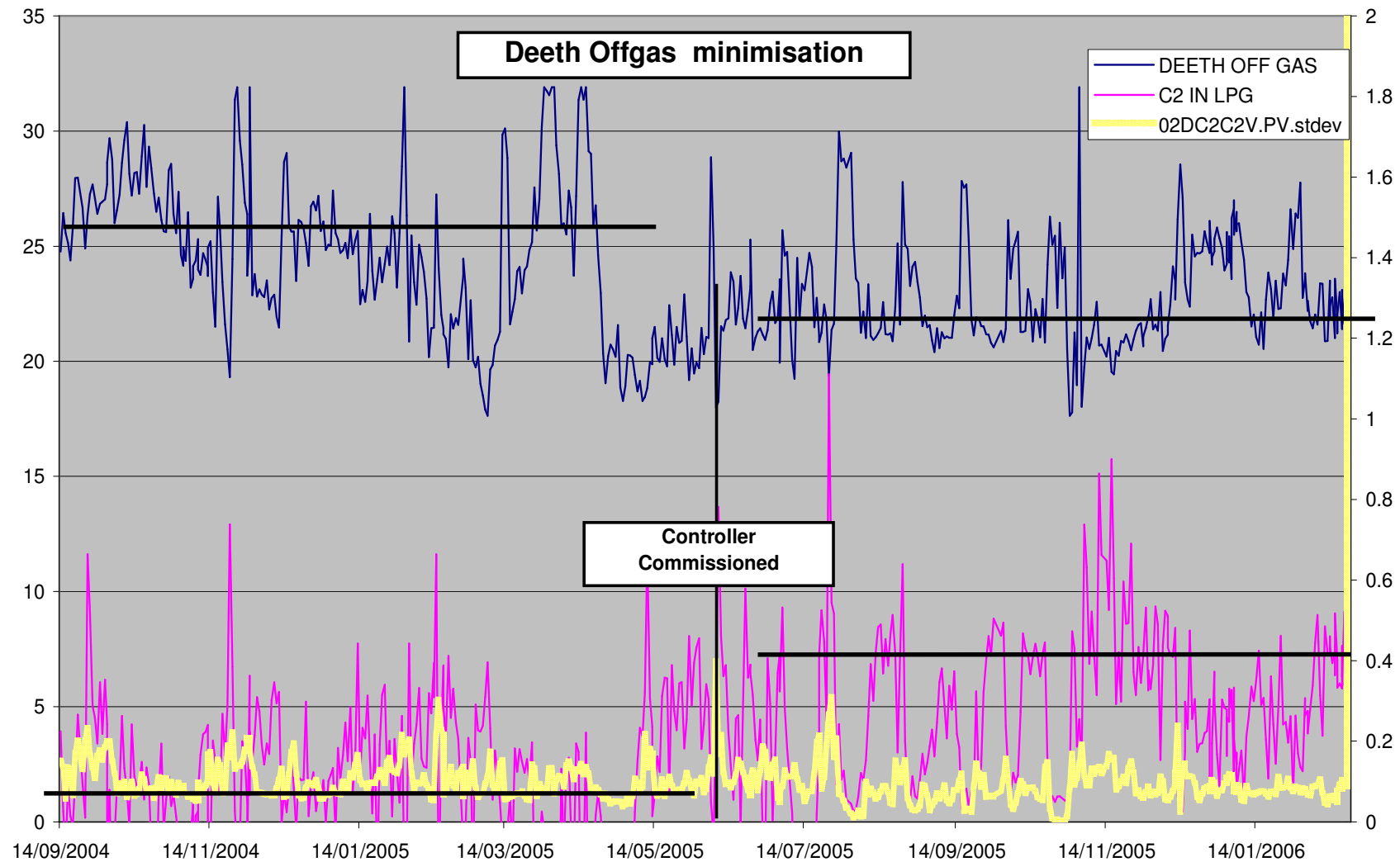
Highlight – Excess O2 optimisation



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Highlight – Deeth Optimisation



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Feature – operator Acceptance

- Easy & user friendly APC monitoring display
- Comprehensive operator's training



Petrocontrol



Highlight – Customised Operator Display

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FCC RMPCT Controller OPTIMISING...

ON OFF

SECTIONS: RX/RG M.FRAC. DE-ETH

ON

MV DESC.	STAT	VALUE	MOVE	LOLIM	HILIM
TC1967 PRIM	ON	117.0		117.0	122.0
TC075 MF/TO	ON	131.5			131.5
FC2612 LCGO	ON	11.0			10.0
FC2368 CHIL	ON	15.0			55.0
FC2369 CHIL	SERV	80.0			40.0
FC1926 ICGO	ON	450.0			460.0
FC044 HCGO	ON	380.4	-0.04	380.0	410.0
FC067 HCGO	ON	494.7	0.01	430.0	495.0
FC2175 HCGO	ON	214.9	-0.68	190.0	220.0

Able to switch on/off the whole controller

CV DESC.	VALUE	SSVAL	LOL	HILIM
MF HCN90	177.9		177.0	186.0
MF HCN EP	194.6	194.7	190.0	200.0
MF HHCN90	215.9			
MF HHCN EP	230.5			
MF LCGO FLS	81.41			
GLITSCH FLO	1003.0			
FC035.SP IC	129.6	129.6	127.5	150.0
HCGO VISCOS	16.10			
HCGO DENSIT	1091.0			
LR3208 TY18	90.51			
FR1980 TPA	322.2	322.5	220.0	370.0
FC2368/9DIF	75.0		-10.0	10.0
PD3056 LCGO	0.125			
FC060 HCGO	41.00			
TC075.OP	17.50			
TC1967.OP	58.33			
FC2612.OP	14.28	14.34	5.000	95.00
FC1926.OP	61.06	59.62	5.000	90.00
FC2368.OP T	26.03	26.16	5.000	98.00
FC2369.OP T	0.000		5.000	95.00

Able to switch on/off, between Sub-controller

Able to drop any CVs or MVs

Able to see which are the critical variables

CV DESC.	VALUE	SSVAL	LOLIM	HILIM
FC044.OP HC	41.65	41.62	10.00	85.00
FC067.OP LC	46.68	46.91	0.00	90.00
FC2175.OP H	94.85	94.00	0.00	94.00
FC1646 HCGO			00	120.0

Able to change Low/High Limit



Highlight – sample training slide

Overview – How to navigate through the Training

FCCU De-Eth RMPCT Move Strategy (MV vs CV)

RMPCT Move Strategy (MV vs CV) : FCCU - Rx/Rg/MF/De/E (De-Eth Section)

How to read the Chart, Example:-

FC410OP is High, RMPCT will move 1st PDC064 Up and FC069 Down, 2nd TC400R Down
 FC410OP is Low, RMPCT will move 1st PDC064 Down and FC069 Up, 2nd TC400R Up

	CV	MV	02FC064	02FC069	02FC071	02FC072	02FC073	02FC074	02FC075	02FC076	02FC077	02FC078	02FC079	02FC080	02FC081	02FC082	02FC083	02FC084	02FC085	02FC086	02FC087	02FC088	02FC089	02FC090	02FC091	02FC092	02FC093	02FC094	02FC095	02FC096	02FC097	02FC098	02FC099	02FC100	02FC101	02FC102	02FC103	02FC104	02FC105	02FC106	02FC107	02FC108	02FC109	02FC110	02FC111	02FC112	02FC113	02FC114	02FC115	02FC116	02FC117	02FC118	02FC119	02FC120	02FC121	02FC122	02FC123	02FC124	02FC125	02FC126	02FC127	02FC128	02FC129	02FC130	02FC131	02FC132	02FC133	02FC134	02FC135	02FC136	02FC137	02FC138	02FC139	02FC140	02FC141	02FC142	02FC143	02FC144	02FC145	02FC146	02FC147	02FC148	02FC149	02FC150	02FC151	02FC152	02FC153	02FC154	02FC155	02FC156	02FC157	02FC158	02FC159	02FC160	02FC161	02FC162	02FC163	02FC164	02FC165	02FC166	02FC167	02FC168	02FC169	02FC170	02FC171	02FC172	02FC173	02FC174	02FC175	02FC176	02FC177	02FC178	02FC179	02FC180	02FC181	02FC182	02FC183	02FC184	02FC185	02FC186	02FC187	02FC188	02FC189	02FC190	02FC191	02FC192	02FC193	02FC194	02FC195	02FC196	02FC197	02FC198	02FC199	02FC200	02FC201	02FC202	02FC203	02FC204	02FC205	02FC206	02FC207	02FC208	02FC209	02FC210	02FC211	02FC212	02FC213	02FC214	02FC215	02FC216	02FC217	02FC218	02FC219	02FC220	02FC221	02FC222	02FC223	02FC224	02FC225	02FC226	02FC227	02FC228	02FC229	02FC230	02FC231	02FC232	02FC233	02FC234	02FC235	02FC236	02FC237	02FC238	02FC239	02FC240	02FC241	02FC242	02FC243	02FC244	02FC245	02FC246	02FC247	02FC248	02FC249	02FC250	02FC251	02FC252	02FC253	02FC254	02FC255	02FC256	02FC257	02FC258	02FC259	02FC260	02FC261	02FC262	02FC263	02FC264	02FC265	02FC266	02FC267	02FC268	02FC269	02FC270	02FC271	02FC272	02FC273	02FC274	02FC275	02FC276	02FC277	02FC278	02FC279	02FC280	02FC281	02FC282	02FC283	02FC284	02FC285	02FC286	02FC287	02FC288	02FC289	02FC290	02FC291	02FC292	02FC293	02FC294	02FC295	02FC296	02FC297	02FC298	02FC299	02FC300	02FC301	02FC302	02FC303	02FC304	02FC305	02FC306	02FC307	02FC308	02FC309	02FC310	02FC311	02FC312	02FC313	02FC314	02FC315	02FC316	02FC317	02FC318	02FC319	02FC320	02FC321	02FC322	02FC323	02FC324	02FC325	02FC326	02FC327	02FC328	02FC329	02FC330	02FC331	02FC332	02FC333	02FC334	02FC335	02FC336	02FC337	02FC338	02FC339	02FC340	02FC341	02FC342	02FC343	02FC344	02FC345	02FC346	02FC347	02FC348	02FC349	02FC350	02FC351	02FC352	02FC353	02FC354	02FC355	02FC356	02FC357	02FC358	02FC359	02FC360	02FC361	02FC362	02FC363	02FC364	02FC365	02FC366	02FC367	02FC368	02FC369	02FC370	02FC371	02FC372	02FC373	02FC374	02FC375	02FC376	02FC377	02FC378	02FC379	02FC380	02FC381	02FC382	02FC383	02FC384	02FC385	02FC386	02FC387	02FC388	02FC389	02FC390	02FC391	02FC392	02FC393	02FC394	02FC395	02FC396	02FC397	02FC398	02FC399	02FC400	02FC401	02FC402	02FC403	02FC404	02FC405	02FC406	02FC407	02FC408	02FC409	02FC410	02FC411	02FC412	02FC413	02FC414	02FC415	02FC416	02FC417	02FC418	02FC419	02FC420	02FC421	02FC422	02FC423	02FC424	02FC425	02FC426	02FC427	02FC428	02FC429	02FC430	02FC431	02FC432	02FC433	02FC434	02FC435	02FC436	02FC437	02FC438	02FC439	02FC440	02FC441	02FC442	02FC443	02FC444	02FC445	02FC446	02FC447	02FC448	02FC449	02FC450	02FC451	02FC452	02FC453	02FC454	02FC455	02FC456	02FC457	02FC458	02FC459	02FC460	02FC461	02FC462	02FC463	02FC464	02FC465	02FC466	02FC467	02FC468	02FC469	02FC470	02FC471	02FC472	02FC473	02FC474	02FC475	02FC476	02FC477	02FC478	02FC479	02FC480	02FC481	02FC482	02FC483	02FC484	02FC485	02FC486	02FC487	02FC488	02FC489	02FC490	02FC491	02FC492	02FC493	02FC494	02FC495	02FC496	02FC497	02FC498	02FC499	02FC500	02FC501	02FC502	02FC503	02FC504	02FC505	02FC506	02FC507	02FC508	02FC509	02FC510	02FC511	02FC512	02FC513	02FC514	02FC515	02FC516	02FC517	02FC518	02FC519	02FC520	02FC521	02FC522	02FC523	02FC524	02FC525	02FC526	02FC527	02FC528	02FC529	02FC530	02FC531	02FC532	02FC533	02FC534	02FC535	02FC536	02FC537	02FC538	02FC539	02FC540	02FC541	02FC542	02FC543	02FC544	02FC545	02FC546	02FC547	02FC548	02FC549	02FC550	02FC551	02FC552	02FC553	02FC554	02FC555	02FC556	02FC557	02FC558	02FC559	02FC560	02FC561	02FC562	02FC563	02FC564	02FC565	02FC566	02FC567	02FC568	02FC569	02FC570	02FC571	02FC572	02FC573	02FC574	02FC575	02FC576	02FC577	02FC578	02FC579	02FC580	02FC581	02FC582	02FC583	02FC584	02FC585	02FC586	02FC587	02FC588	02FC589	02FC590	02FC591	02FC592	02FC593	02FC594	02FC595	02FC596	02FC597	02FC598	02FC599	02FC600	02FC601	02FC602	02FC603	02FC604	02FC605	02FC606	02FC607	02FC608	02FC609	02FC610	02FC611	02FC612	02FC613	02FC614	02FC615	02FC616	02FC617	02FC618	02FC619	02FC620	02FC621	02FC622	02FC623	02FC624	02FC625	02FC626	02FC627	02FC628	02FC629	02FC630	02FC631	02FC632	02FC633	02FC634	02FC635	02FC636	02FC637	02FC638	02FC639	02FC640	02FC641	02FC642	02FC643	02FC644	02FC645	02FC646	02FC647	02FC648	02FC649	02FC650	02FC651	02FC652	02FC653	02FC654	02FC655	02FC656	02FC657	02FC658	02FC659	02FC660	02FC661	02FC662	02FC663	02FC664	02FC665	02FC666	02FC667	02FC668	02FC669	02FC670	02FC671	02FC672	02FC673	02FC674	02FC675	02FC676	02FC677	02FC678	02FC679	02FC680	02FC681	02FC682	02FC683	02FC684	02FC685	02FC686	02FC687	02FC688	02FC689	02FC690	02FC691	02FC692	0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- Number (0, 1, 2, etc.) refers to the order of MV's movement, with 0 as the most likely to be moved, and becoming less likely as the number increases
- Direction of MV's movement is defined by
 U as to increase (or move up)
 D as to decrease (or move down)
- High/Low are the CV's operating boundaries when is breached, will cause MVs to move in the defined direction.

Click on those buttons to see RMPCT Move Strategy for each section

Click on it to view next slide

Click on it to view previous slide

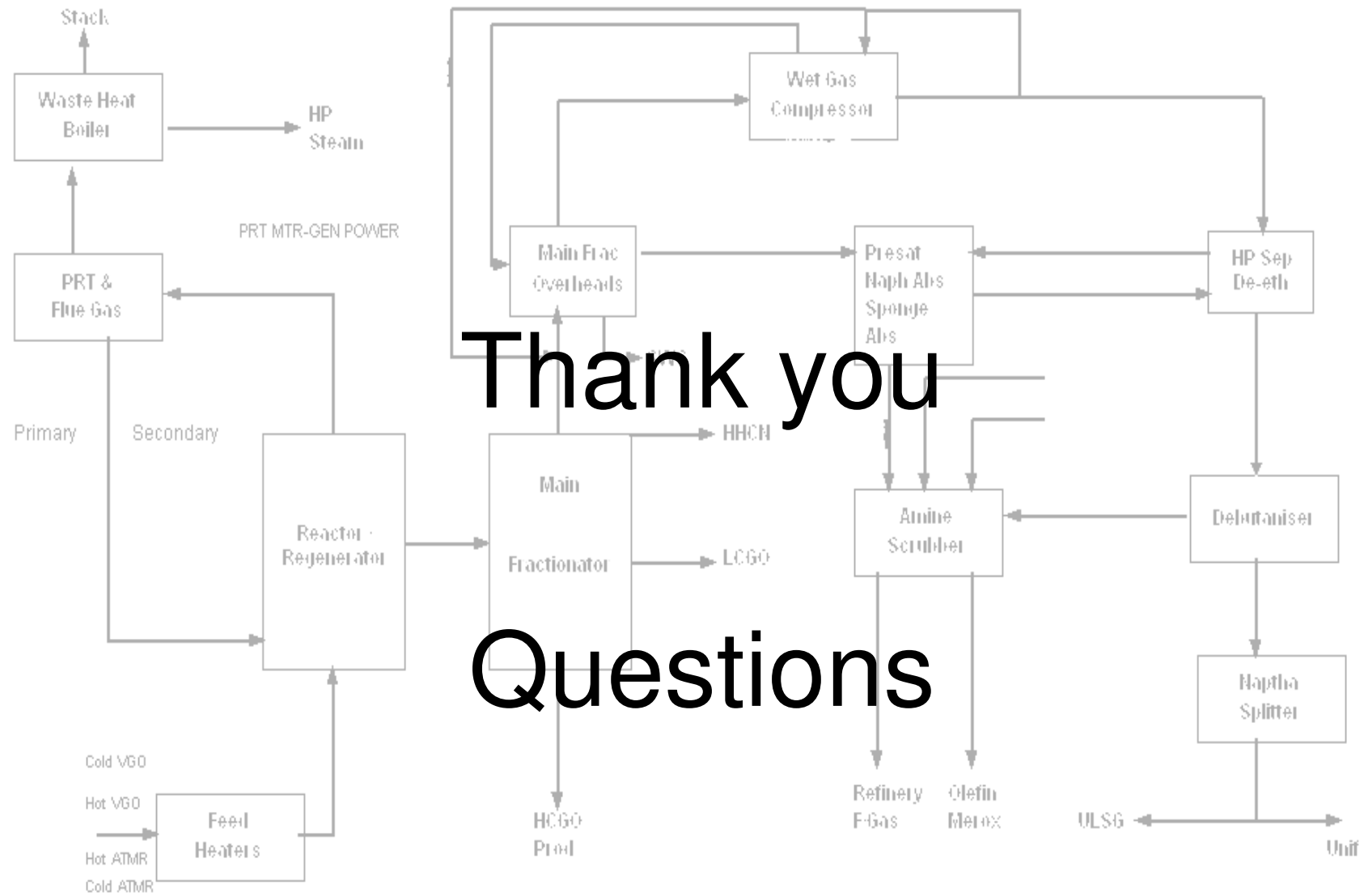
Click on it to view RMPCT Move Strategy

Click on it to view DCS Ops display

Click on any of the MV or CV tags to view detail schematic

De-ethaniser Operator Screen





Thank you

Questions



Petrocontrol

AMT