About OMICS Group

OMICS Group International is an amalgamation of Open Access publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 400 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 300 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

About OMICS Group Conferences

OMICS Group International is a pioneer and leading science event organizer, which publishes around 400 open access journals and conducts over 300 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

OPTIMIZATION FOR CCR

NHT = 33000 BPSD

CCR=20000 BPSD

NHT Feed

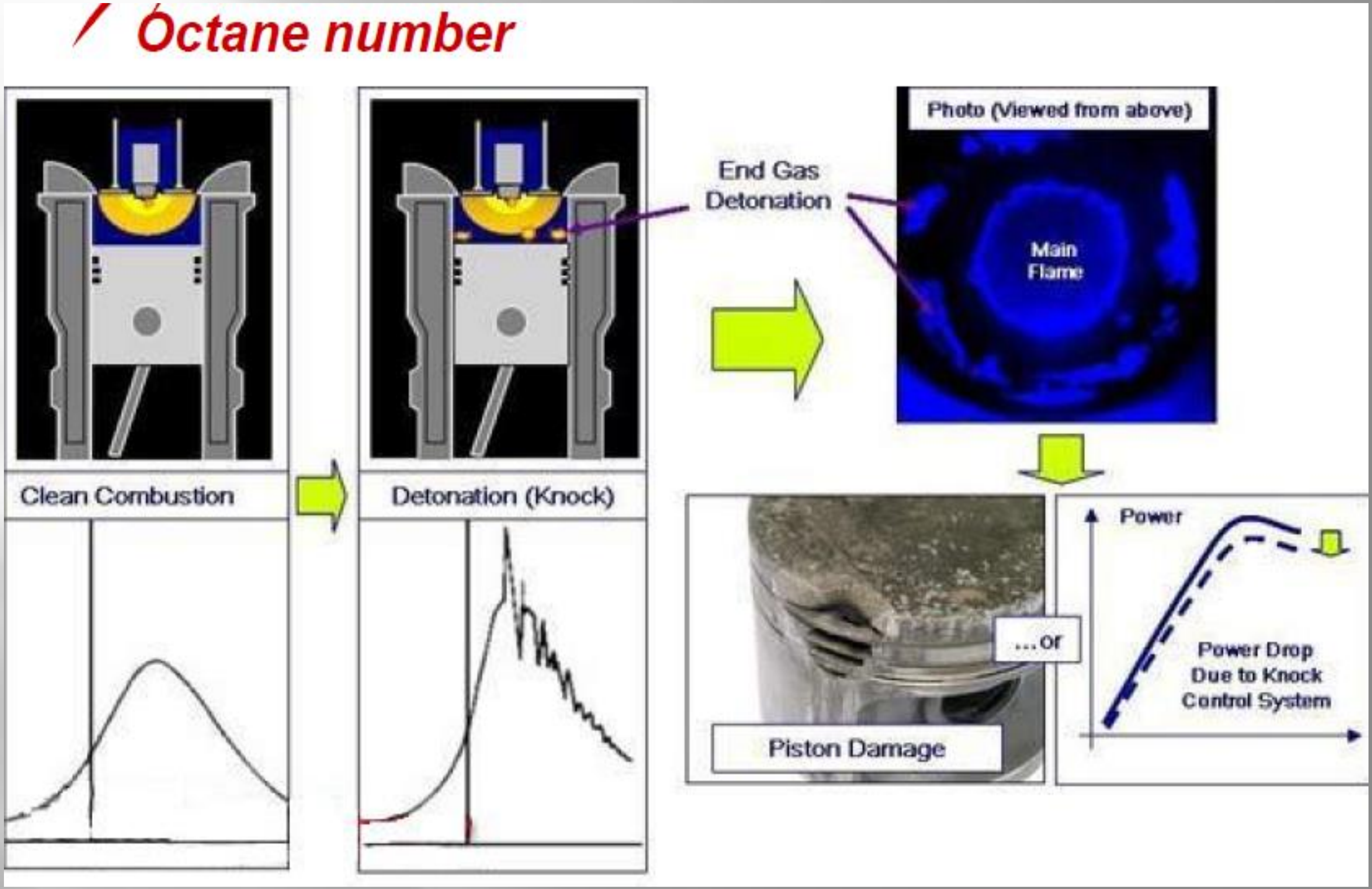
	Stabilized WSR Naphtha from Existing Stabilizer	SR Light Naphtha from Existing Splitter	WSR Naphtha from New Stabilizer in CDU2	**Total Design Feedstock**	Test Method
Blend Ratio, vol%	15.8	17.4	66.8	**100**	
Sp.Gr. (60°F/60°F)	0.729	0.703	0.730	**0.725**	ASTM D-1298
Distillation (°C)					ASTM D86
IBP	66	55	57	**58**	
5 vol%	80	58	64	**64**	
10 vol%	85	62	70	**72**	
30 vol%	95	70	94	**89**	
50 vol%	104	74	110	**101**	
70 vol%	118	79	131	**119**	
90 vol%	134	83	155	**149**	
95 vol%	141	89	162	**157**	
FBP	151	98	181	**176**	
Total Sulfur, wt%	Max. 0.05			**Max. 0.05**	ASTM D-4294
Mercaptan Sulfur, wtppm	Max. 100			**Max. 100**	UOP163
Total Nitrogen, wtppm	Max. 1.5			**Max. 1.5**	ASTM D-4629

NAPHTA SPLITTER

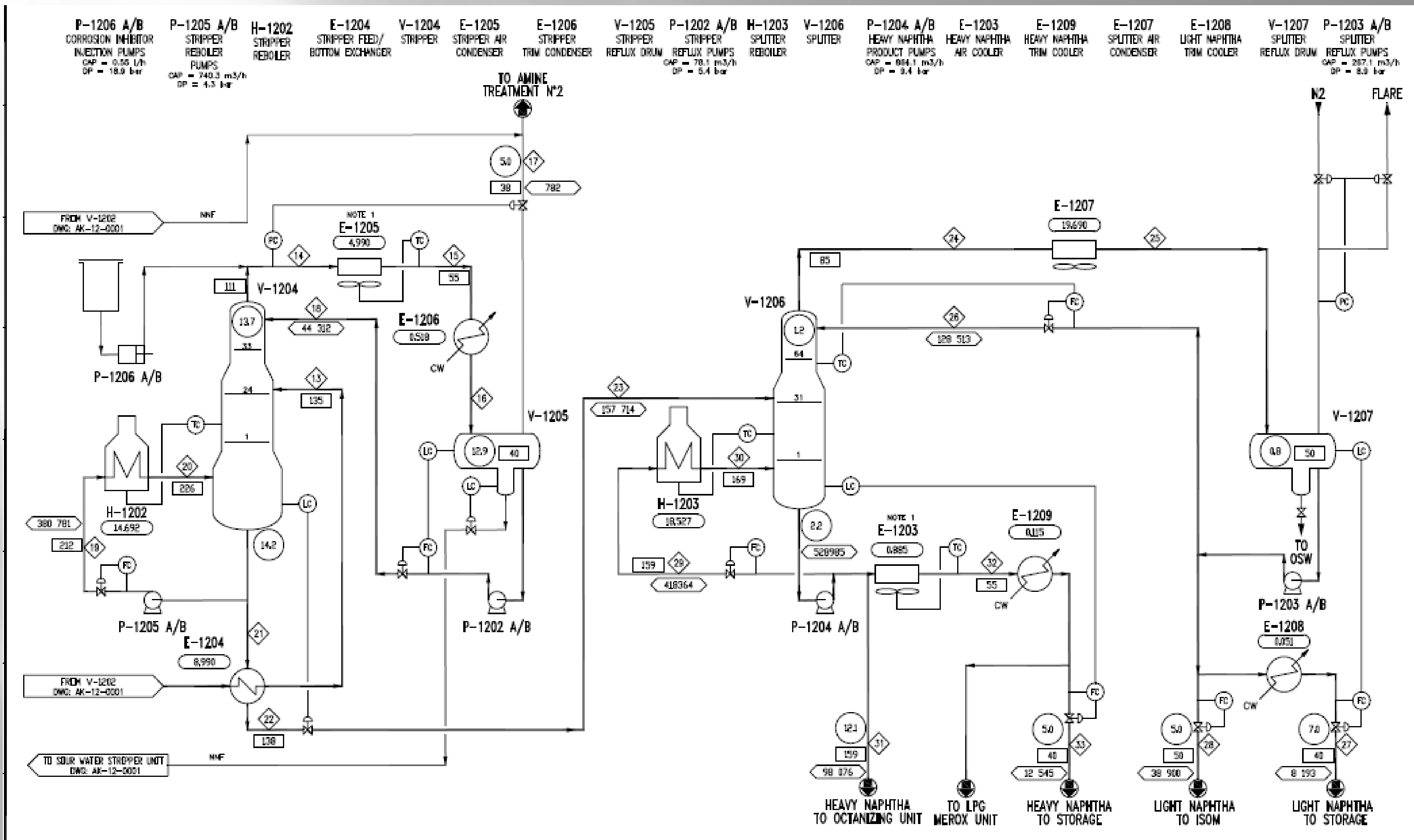
L.N =30-95 C_5-C_6

H.N = 100-175 C_6-C_{12}

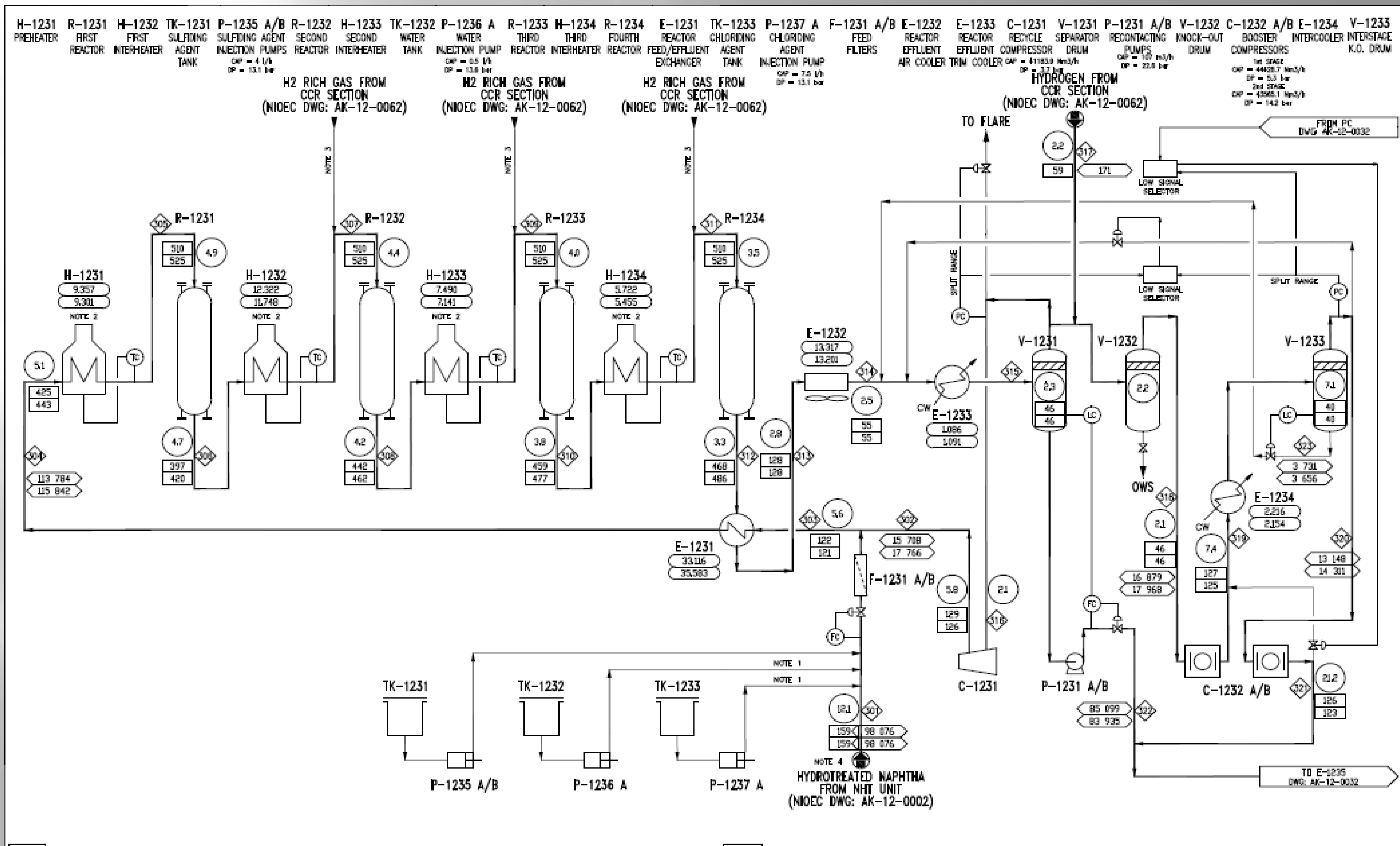
Effect of RON

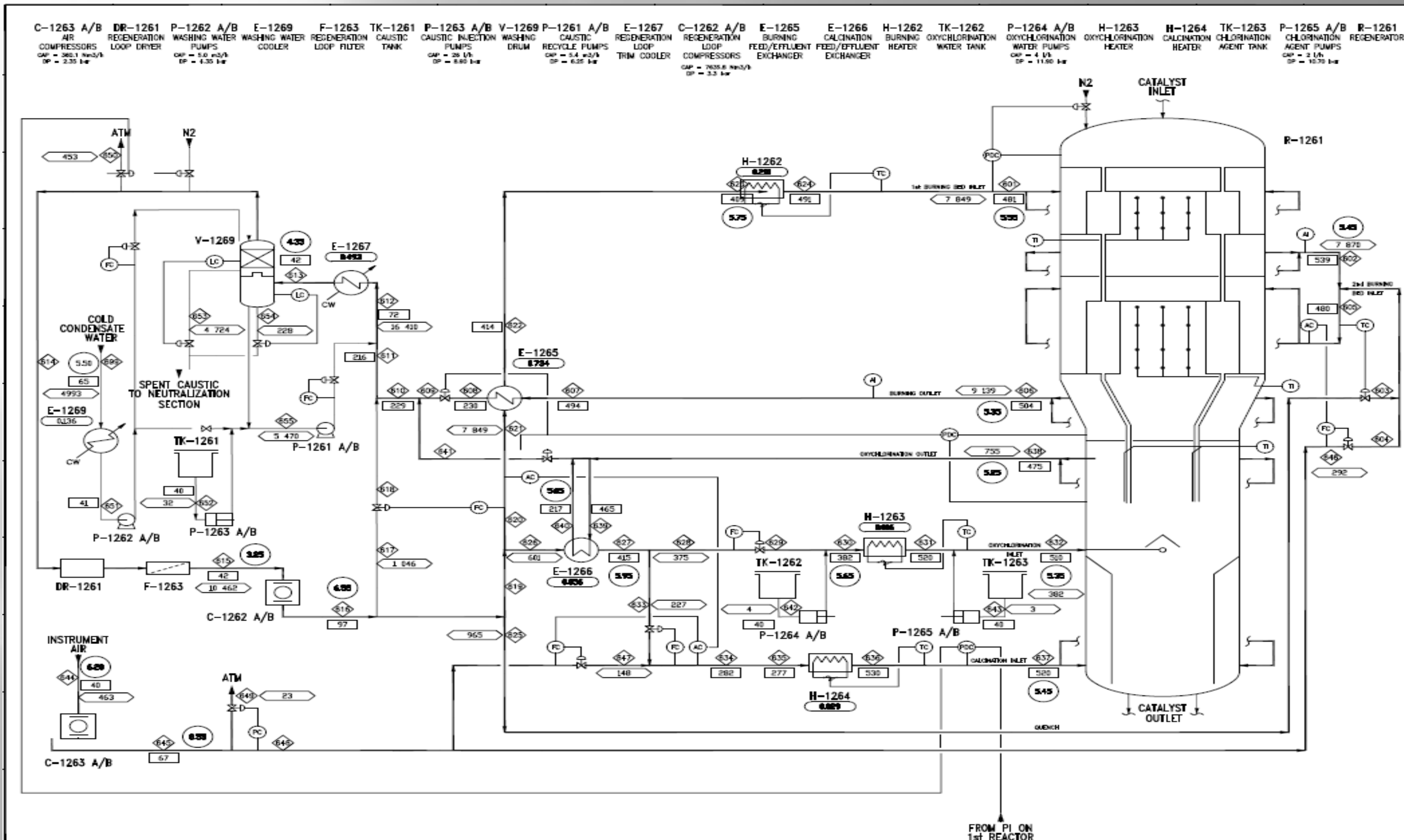


PFD

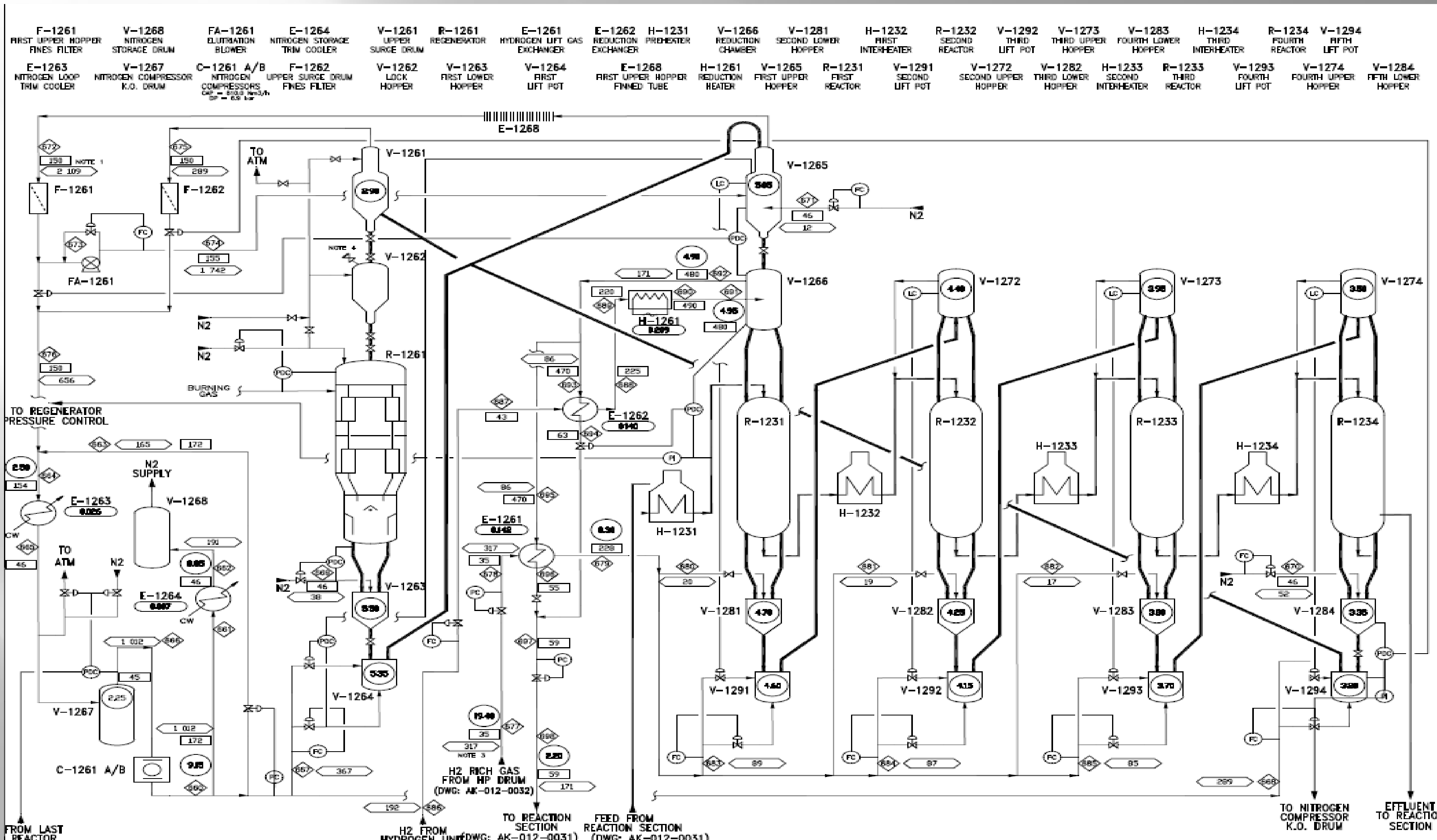


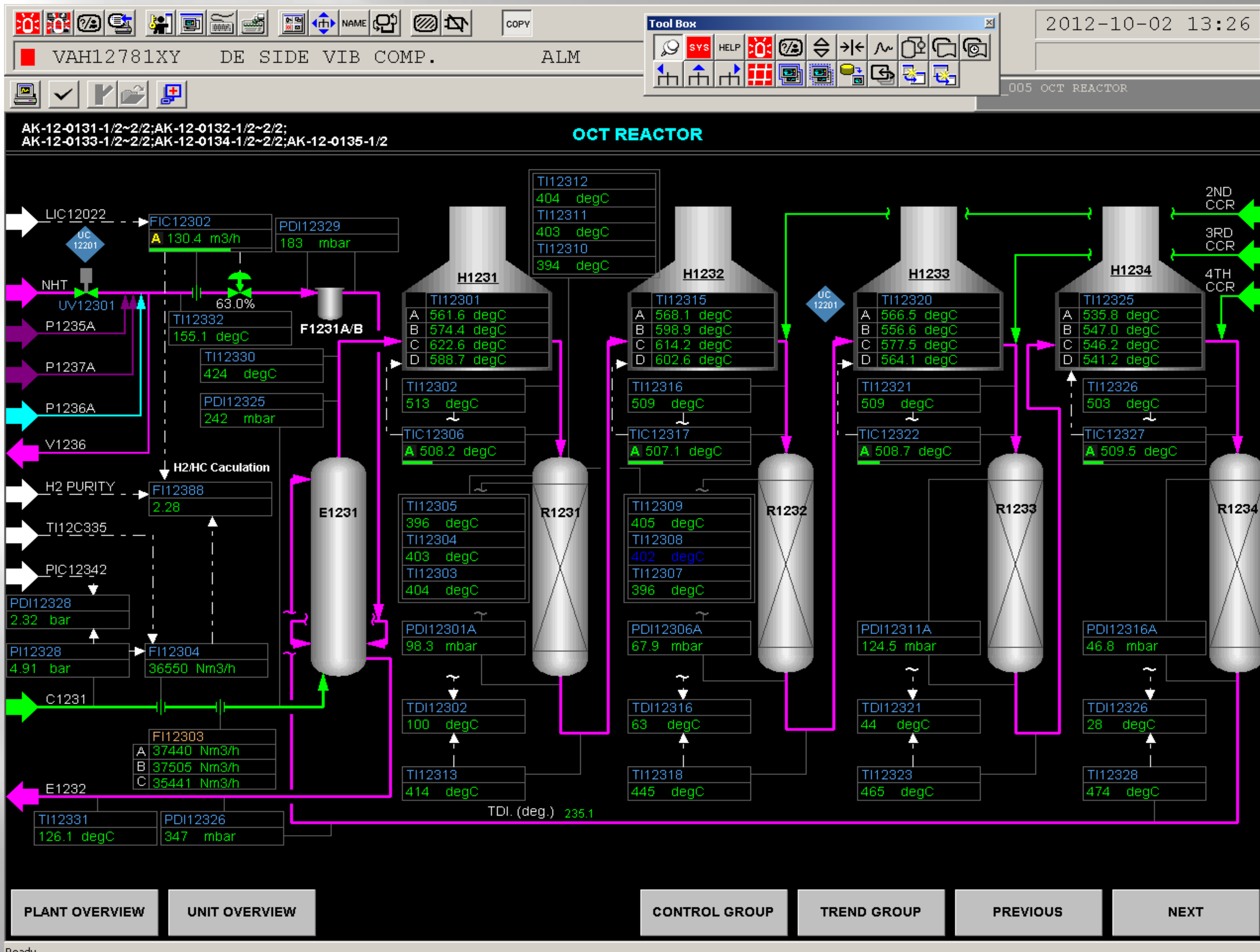
P-1206 A/B
CORROSION INHIBITOR INJECTION PUMPS
P-1205 A/B
STRIPPER REBOILER PUMPS
CAP = 740.3 m3/h
DP = 4.3 bar
H-1202
STRIPPER REBOILER
E-1204
STRIPPER FEED/ BOTTOM EXCHANGER
V-1204
STRIPPER
E-1205
STRIPPER AIR CONDENSER
E-1206
STRIPPER TRIM CONDENSER
V-1205
STRIPPER REFLUX DRUM
P-1202 A/B
STRIPPER REFLUX PUMPS
CAP = 78.1 m3/h
DP = 5.4 bar
H-1203
SPLITTER REBOILER
V-1206
SPLITTER
P-1204 A/B
HEAVY NAPHTHA PRODUCT PUMPS
E-1203
HEAVY NAPHTHA AIR COOLER
E-1209
HEAVY NAPHTHA TRIM COOLER
E-1207
SPLITTER AIR CONDENSER
E-1208
LIGHT NAPHTHA TRIM COOLER
V-1207
SPLITTER REFLUX DRUM
P-1203 A/B
SPLITTER REFLUX PUMPS
TO AMINE TREATMENT N°2
N2
FLARE
FROM V-1202
DWG: AK-12-0001
TO SOUR WATER STRIPPER UNIT
DWG: AK-12-0001
TO OSW
HEAVY NAPHTHA TO OCTANIZING UNIT
TO LPG MEROX UNIT
HEAVY NAPHTHA TO STORAGE
LIGHT NAPHTHA TO ISOM
LIGHT NAPHTHA TO STORAGE


H-1231 PREHEATER
R-1231 FIRST REACTOR
H-1232 FIRST INTERHEATER
TK-1231 SULFIDING AGENT TANK
P-1235 A/B SULFIDING AGENT INJECTION PUMPS
R-1232 SECOND REACTOR
H-1233 SECOND INTERHEATER
TK-1232 WATER TANK
P-1236 A WATER INJECTION PUMP
R-1233 THIRD REACTOR
H-1234 THIRD INTERHEATER
R-1234 FOURTH REACTOR
E-1231 REACTOR FEED/EFFLUENT EXCHANGER
TK-1233 CHLORIDING AGENT TANK
P-1237 A CHLORIDING AGENT INJECTION PUMP
F-1231 A/B FEED FILTERS
E-1232 REACTOR EFFLUENT AIR COOLER
E-1233 REACTOR EFFLUENT TRIM COOLER
C-1231 RECYCLE COMPRESSOR
V-1231 SEPARATOR DRUM
P-1231 A/B RECONTACTING PUMPS
V-1232 KNOCK-OUT DRUM
C-1232 A/B BOOSTER COMPRESSORS
E-1234 INTERCOOLER
V-1233 INTERSTAGE K.O. DRUM
H2 RICH GAS FROM CCR SECTION (NIOEC DWG: AK-12-0062)
H2 RICH GAS FROM CCR SECTION (NIOEC DWG: AK-12-0062)
H2 RICH GAS FROM CCR SECTION (NIOEC DWG: AK-12-0062)
HYDROGEN FROM CCR SECTION (NIOEC DWG: AK-12-0062)
TO FLARE
FROM PC DWG AK-12-0032
LOW SIGNAL SELECTOR
LOW SIGNAL SELECTOR
SPLIT RANGE
SPLIT RANGE
R-1231
R-1232
R-1233
R-1234
H-1231
H-1232
H-1233
H-1234
E-1232
E-1233
E-1231
E-1234
V-1231
V-1232
V-1233
F-1231 A/B
C-1231
P-1231 A/B
C-1232 A/B
OWS
CW
TK-1231
TK-1232
TK-1233
P-1235 A/B
P-1236 A
P-1237 A
HYDROTREATED NAPHTHA FROM NHT UNIT (NIOEC DWG: AK-12-0002)
TO E-1235 DWG: AK-12-0032



C-1263 A/B
AIR COMPRESSORS
DR-1261
REGENERATION LOOP DRYER
P-1262 A/B
WASHING WATER PUMPS
E-1269
WASHING WATER COOLER
F-1263
REGENERATION LOOP FILTER
TK-1261
CAUSTIC TANK
P-1263 A/B
CAUSTIC INJECTION PUMPS
V-1269
WASHING DRUM
P-1261 A/B
CAUSTIC RECYCLE PUMPS
E-1267
REGENERATION LOOP TRIM COOLER
C-1262 A/B
REGENERATION LOOP COMPRESSORS
E-1265
BURNING FEED/EFFLUENT EXCHANGER
E-1266
CALCINATION FEED/EFFLUENT EXCHANGER
H-1262
BURNING HEATER
TK-1262
OXYCHLORINATION WATER TANK
P-1264 A/B
OXYCHLORINATION WATER PUMPS
H-1263
OXYCHLORINATION HEATER
H-1264
CALCINATION HEATER
TK-1263
CHLORINATION AGENT TANK
P-1265 A/B
CHLORINATION AGENT PUMPS
R-1261
REGENERATOR
N2
CATALYST INLET
ATM
COLD CONDENSATE WATER
SPENT CAUSTIC TO NEUTRALIZATION SECTION
CW
INSTRUMENT AIR
CATALYST OUTLET
FROM PI ON 1st REACTOR


F-1261 FIRST UPPER HOPPER FINES FILTER
V-1268 NITROGEN STORAGE DRUM
FA-1261 ELUTRIATION BLOWER
E-1264 NITROGEN STORAGE TRIM COOLER
V-1261 UPPER SURGE DRUM
R-1261 REGENERATOR
E-1261 HYDROGEN LIFT GAS EXCHANGER
E-1262 REDUCTION EXCHANGER
H-1231 PREHEATER
V-1266 REDUCTION CHAMBER
V-1281 SECOND LOWER HOPPER
H-1232 FIRST INTERHEATER
R-1232 SECOND REACTOR
V-1292 THIRD LIFT POT
V-1273 THIRD UPPER HOPPER
V-1283 FOURTH LOWER HOPPER
H-1234 THIRD INTERHEATER
R-1234 FOURTH REACTOR
V-1294 FIFTH LIFT POT
E-1263 NITROGEN LOOP TRIM COOLER
V-1267 NITROGEN COMPRESSOR K.O. DRUM
C-1261 A/B NITROGEN COMPRESSORS
F-1262 UPPER SURGE DRUM FINES FILTER
V-1262 LOCK HOPPER
V-1263 FIRST LOWER HOPPER
V-1264 FIRST LIFT POT
E-1268 FIRST UPPER HOPPER FINNED TUBE
H-1261 REDUCTION HEATER
V-1265 FIRST UPPER HOPPER
R-1231 FIRST REACTOR
V-1291 SECOND LIFT POT
V-1272 SECOND UPPER HOPPER
V-1282 THIRD LOWER HOPPER
H-1233 SECOND INTERHEATER
R-1233 THIRD REACTOR
V-1293 FOURTH LIFT POT
V-1274 FOURTH UPPER HOPPER
V-1284 FIFTH LOWER HOPPER
TO ATM
N2
BURNING GAS
TO REGENERATOR PRESSURE CONTROL
N2 SUPPLY
CW
FROM LAST REACTOR
H2 RICH GAS FROM HP DRUM (DWG: AK-012-0032)
H2 FROM HYDROGEN UNIT
TO REACTION SECTION (DWG: AK-012-0031)
FEED FROM REACTION SECTION (DWG: AK-012-0031)
TO NITROGEN COMPRESSOR K.O. DRUM
EFFLUENT TO REACTION SECTION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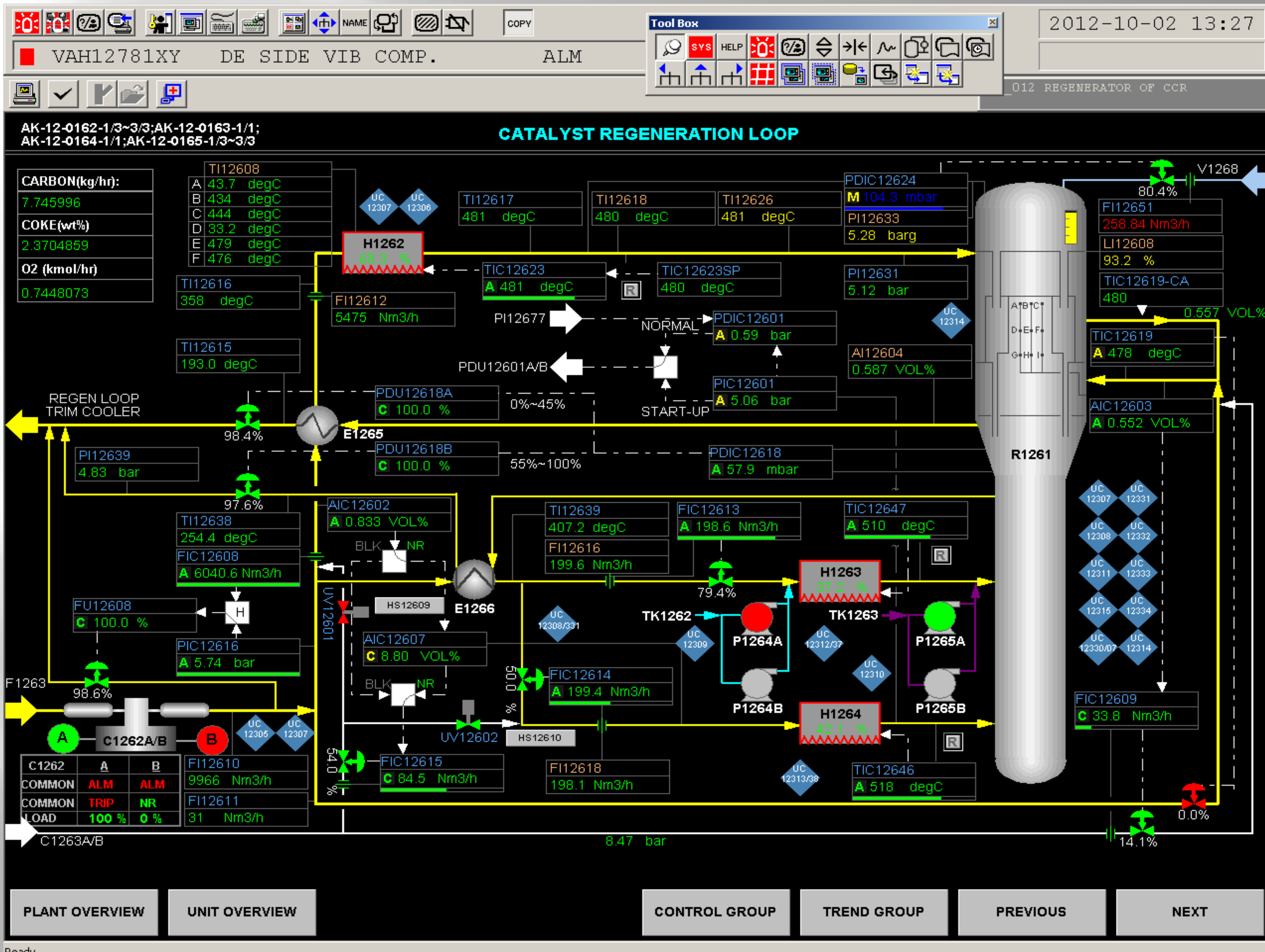
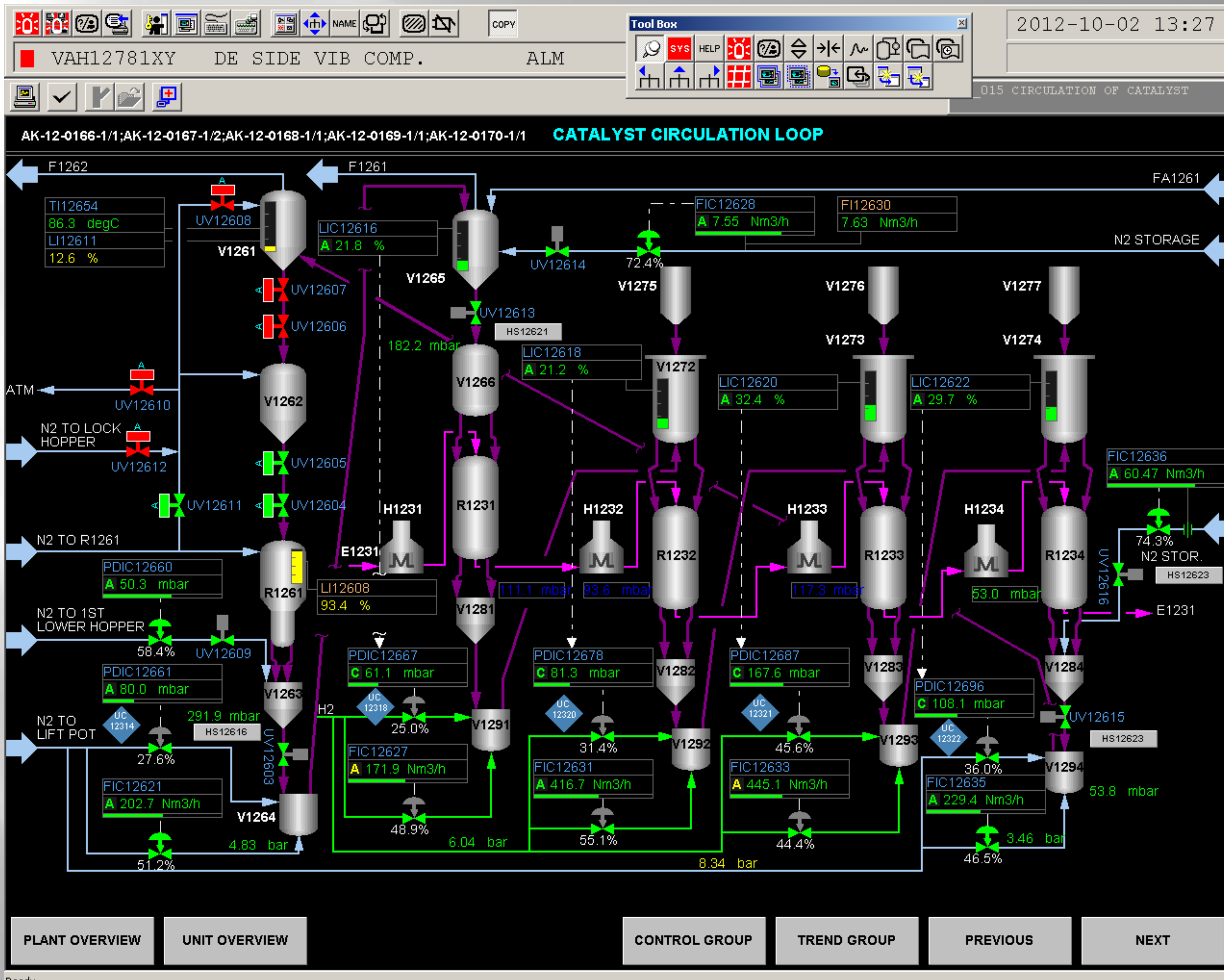
VAH12781XY DE SIDE VIB COMP. ALM
Tool Box
005 OCT REACTOR
AK-12-0131-1/2~2/2;AK-12-0132-1/2~2/2;
AK-12-0133-1/2~2/2;AK-12-0134-1/2~2/2;AK-12-0135-1/2
OCT REACTOR
H1231
H1232
H1233
H1234
R1231
R1232
R1233
R1234
E1231
F1231A/B
2ND CCR
3RD CCR
4TH CCR
LIC12022
NHT
UV12301
P1235A
P1237A
P1236A
V1236
H2 PURITY
TI12C335
PIC12342
C1231
E1232
H2/HC Caculation
FIC12302 A 130.4 m3/h
PDI12329 183 mbar
TI12332 155.1 degC
TI12330 424 degC
PDI12325 242 mbar
FI12388 2.28
PDI12328 2.32 bar
PI12328 4.91 bar
FI12304 36550 Nm3/h
FI12303 A 37440 Nm3/h B 37505 Nm3/h C 35441 Nm3/h
TI12331 126.1 degC
PDI12326 347 mbar
TI12312 404 degC
TI12311 403 degC
TI12310 394 degC
TI12301 A 561.6 degC B 574.4 degC C 622.6 degC D 588.7 degC
TI12315 A 568.1 degC B 598.9 degC C 614.2 degC D 602.6 degC
TI12320 A 566.5 degC B 556.6 degC C 577.5 degC D 564.1 degC
TI12325 A 535.8 degC B 547.0 degC C 546.2 degC D 541.2 degC
TI12302 513 degC
TI12316 509 degC
TI12321 509 degC
TI12326 503 degC
TIC12306 A 508.2 degC
TIC12317 A 507.1 degC
TIC12322 A 508.7 degC
TIC12327 A 509.5 degC
TI12305 396 degC
TI12304 403 degC
TI12303 404 degC
TI12309 405 degC
TI12308 402 degC
TI12307 396 degC
PDI12301A 98.3 mbar
PDI12306A 67.9 mbar
PDI12311A 124.5 mbar
PDI12316A 46.8 mbar
TDI12302 100 degC
TDI12316 63 degC
TDI12321 44 degC
TDI12326 28 degC
TI12313 414 degC
TI12318 445 degC
TI12323 465 degC
TI12328 474 degC
TDI. (deg.) 235.1
63.0%
PLANT OVERVIEW
UNIT OVERVIEW
CONTROL GROUP
TREND GROUP
PREVIOUS
NEXT
Ready



2012-10-02 13:27
VAH12781XY DE SIDE VIB COMP. ALM
Tool Box
012 REGENERATOR OF CCR
AK-12-0162-1/3~3/3;AK-12-0163-1/1;
AK-12-0164-1/1;AK-12-0165-1/3~3/3
CATALYST REGENERATION LOOP
CARBON(kg/hr):
7.745996
COKE(wt%)
2.3704859
O2 (kmol/hr)
0.7448073
TI12608
A 43.7 degC
B 434 degC
C 444 degC
D 33.2 degC
E 479 degC
F 476 degC
H1262
TI12617 481 degC
TI12618 480 degC
TI12626 481 degC
PDIC12624
PI12633 5.28 barg
V1268
80.4%
FI12651 258.84 Nm3/h
LI12608 93.2 %
TIC12619-CA 480
0.557 VOL%
TI12616 358 degC
FI12612 5475 Nm3/h
TIC12623 A 481 degC
TIC12623SP 480 degC
PI12631 5.12 bar
PI12677
NORMAL
PDIC12601 A 0.59 bar
TI12615 193.0 degC
PDU12601A/B
AI12604 0.587 VOL%
TIC12619 A 478 degC
PIC12601 A 5.06 bar
START-UP
REGEN LOOP
TRIM COOLER
PDU12618A C 100.0 %
0%~45%
98.4%
E1265
AIC12603 A 0.552 VOL%
R1261
PI12639 4.83 bar
PDU12618B C 100.0 %
55%~100%
PDIC12618 A 57.9 mbar
97.6%
TI12638 254.4 degC
AIC12602 A 0.833 VOL%
TI12639 407.2 degC
FIC12613 A 198.6 Nm3/h
TIC12647 A 510 degC
FIC12608 A 6040.6 Nm3/h
BLK
NR
FI12616 199.6 Nm3/h
H1263
79.4%
FU12608 C 100.0 %
HS12609
E1266
TK1262
TK1263
P1264A
P1265A
UV12601
AIC12607 C 8.80 VOL%
PIC12616 A 5.74 bar
F1263
98.6%
FIC12614 A 199.4 Nm3/h
P1264B
P1265B
H1264
FIC12609 C 33.8 Nm3/h
C1262A/B
UV12602
HS12610
C1262 A B
COMMON ALM ALM
COMMON TRIP NR
LOAD 100 % 0 %
FI12610 9966 Nm3/h
FI12611 31 Nm3/h
FIC12615 C 84.5 Nm3/h
FI12618 198.1 Nm3/h
TIC12646 A 518 degC
0.0%
14.1%
C1263A/B
8.47 bar
PLANT OVERVIEW
UNIT OVERVIEW
CONTROL GROUP
TREND GROUP
PREVIOUS
NEXT
Ready


COPY
VAH12781XY DE SIDE VIB COMP. ALM
Tool Box
SYS
HELP
2012-10-02 13:27
015 CIRCULATION OF CATALYST
AK-12-0166-1/1;AK-12-0167-1/2;AK-12-0168-1/1;AK-12-0169-1/1;AK-12-0170-1/1
CATALYST CIRCULATION LOOP
F1262
F1261
FA1261
TI12654
86.3 degC
LI12611
12.6 %
UV12608
V1261
LIC12616
A 21.8 %
V1265
UV12614
72.4%
FIC12628
A 7.55 Nm3/h
FI12630
7.63 Nm3/h
N2 STORAGE
V1275
V1276
V1277
UV12607
UV12606
UV12613
HS12621
182.2 mbar
LIC12618
A 21.2 %
V1273
V1274
V1272
LIC12620
A 32.4 %
LIC12622
A 29.7 %
ATM
UV12610
V1262
V1266
N2 TO LOCK HOPPER
UV12612
UV12605
FIC12636
A 60.47 Nm3/h
UV12611
UV12604
H1231
R1231
H1232
H1233
H1234
N2 TO R1261
E1231
R1232
R1233
R1234
74.3%
N2 STOR.
HS12623
PDIC12660
A 50.3 mbar
R1261
LI12608
93.4 %
111.1 mbar
93.6 mbar
117.3 mbar
53.0 mbar
UV12616
E1231
N2 TO 1ST LOWER HOPPER
58.4%
UV12609
V1281
PDIC12667
C 61.1 mbar
PDIC12678
C 81.3 mbar
PDIC12687
C 167.6 mbar
V1282
V1283
V1284
PDIC12661
A 80.0 mbar
V1263
H2
UC 12318
UC 12320
UC 12321
PDIC12696
C 108.1 mbar
UV12615
N2 TO LIFT POT
UC 12314
291.9 mbar
HS12616
25.0%
V1291
31.4%
V1292
45.6%
V1293
UC 12322
HS12623
27.6%
UV12603
FIC12627
A 171.9 Nm3/h
FIC12631
A 416.7 Nm3/h
FIC12633
A 445.1 Nm3/h
36.0%
V1294
FIC12635
A 229.4 Nm3/h
53.8 mbar
FIC12621
A 202.7 Nm3/h
V1264
48.9%
55.1%
44.4%
3.46 bar
4.83 bar
6.04 bar
51.2%
8.34 bar
46.5%
PLANT OVERVIEW
UNIT OVERVIEW
CONTROL GROUP
TREND GROUP
PREVIOUS
NEXT
Ready

FEED PONA

TBP Cut 100-150 °C, vol%	50.2	1.0	37.4	**33.1**
PONA Distribution, vol% on CUT				
P	(58)	(58)	(58)	**(58)**
O	(0)	(0)	(0)	**(0)**
N	(30)	(30)	(30)	**(30)**
A	(12)	(12)	(12)	**(12)**
TBP Cut 150-175 °C, vol%	3.9	0.0	19.2	**13.5**
PONA Distribution, vol% on CUT				
P	(53)	(53)	(53)	**(53)**
O	(0)	(0)	(0)	**(0)**
N	(27)	(27)	(27)	**(27)**
A	(20)	(20)	(20)	**(20)**
Total, vol%	100.0	100.0	100.0	100.0

Product Spec

Unstabilized LPG
Unstabilized LPG from OCT unit shall be further processed by G/C in RFCC.

Properties	Expected value	Test Method
Flow Rate, BPSD	325	
Composition, wt %		ASTM D-2163
C2	9.9	
C3	47.7	
iC4	23.0	
nC4	18.9	
C5	0.5	
Total	100.0	
Chloride Content, wtppm	Less than 1.0	

OCT Reformate
OCT Reformate will be used as a MOGAS blending component.

Properties	Expected value	Test Method
Sp.Gr. (60°F/60°F)	0.814	ASTM D-1298
Distillation, Deg C IBP 10% 50% 90% EP	 45 83 114 168 205	ASTM D86
MON	89	ASTM D-2700
RVP, kPaA	29	ASTM D-323
Olefin Content	1.5 vol%	UOP-880 or equivalent

Properties	Guarantee Value	Test Method
Benzene Content	Max. 1.0 vol%	UOP-880 or equivalent
Aromatic Content	Max. 71.0 vol%	UOP-880 or equivalent
RON	Min. 100	ASTM D-2699

CCR FEED SPECIFICATION

Sulfured < 0.5 PPMW

Nitrogen< 0.1 PPMW

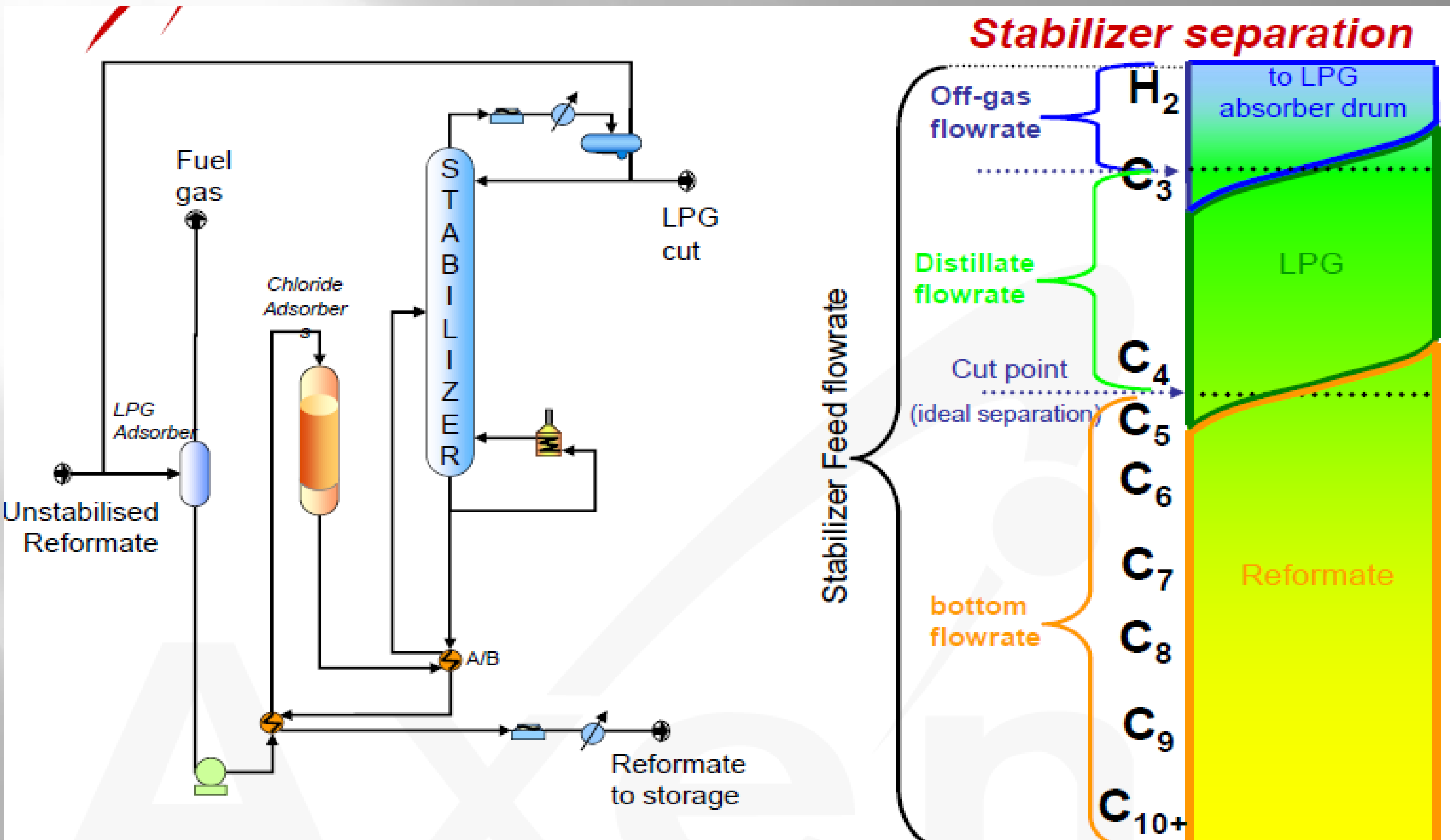
METAL < 5 PPB

MAIN SECTION:

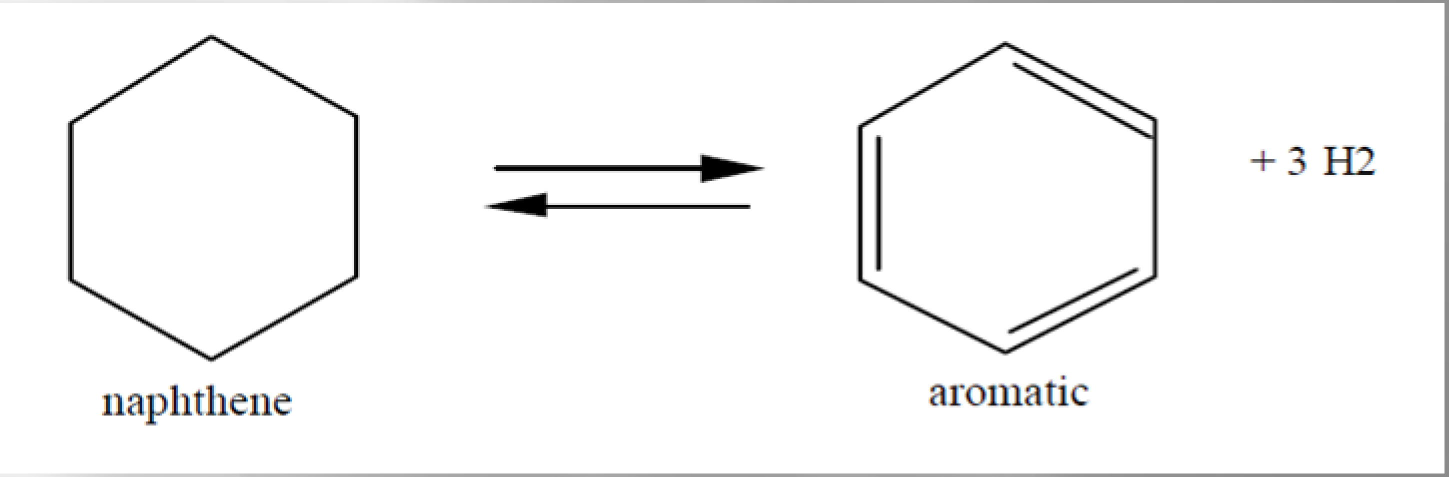
1-Reaction Section

2-Compression & Re contacting Section

3-LPG Recovery & Stabilization Section


Stabilizer separation
Fuel gas
LPG cut
Chloride Adsorber
LPG Adsorber
Unstabilised Reformate
STABILIZER
A/B
Reformate to storage
Stabilizer Feed flowrate
Off-gas flowrate
Distillate flowrate
Cut point
(ideal separation)
bottom flowrate
H_2
C_3
C_4
C_5
C_6
C_7
C_8
C_9
C_{10+}
to LPG absorber drum
LPG
Reformate

MAIN REACTIONS:



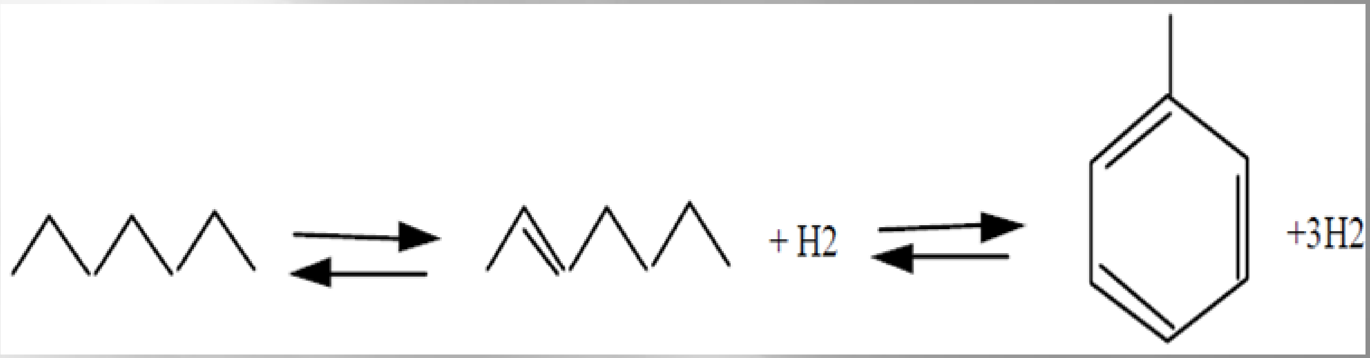
EFFECT OF DEHYDROGENATION NAPHTENE ON RON

MON	RON	PURE COMPONENT
77.2	83	Cycle Hexane
61.2	67.2	Ethyl Cycle Pentane
71.1	74.8	Methyl Cycle Hexane
71	71.7	1-3 di Methyl Cycle Hexane
103.5	120	Toluene
100	114.8	Benzene

LINEAR PARAFFINE ISOMERIZATION REACTION

ACIDITY EFFECT

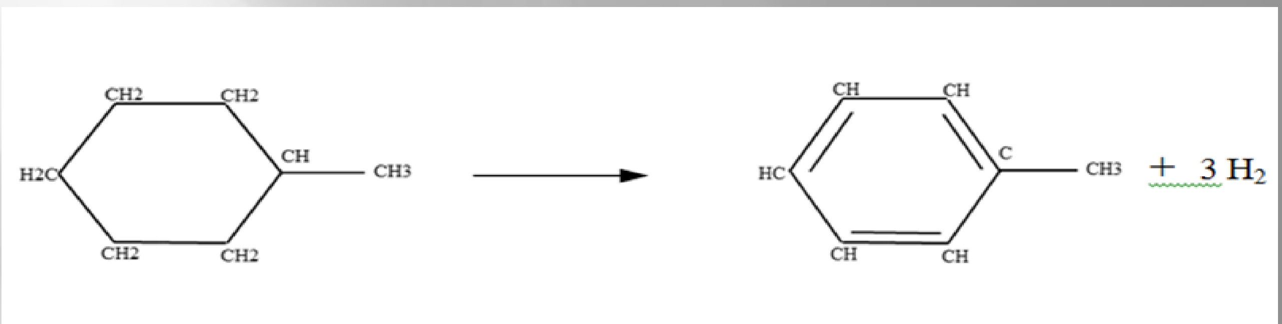
EXOTERMIC REACTION

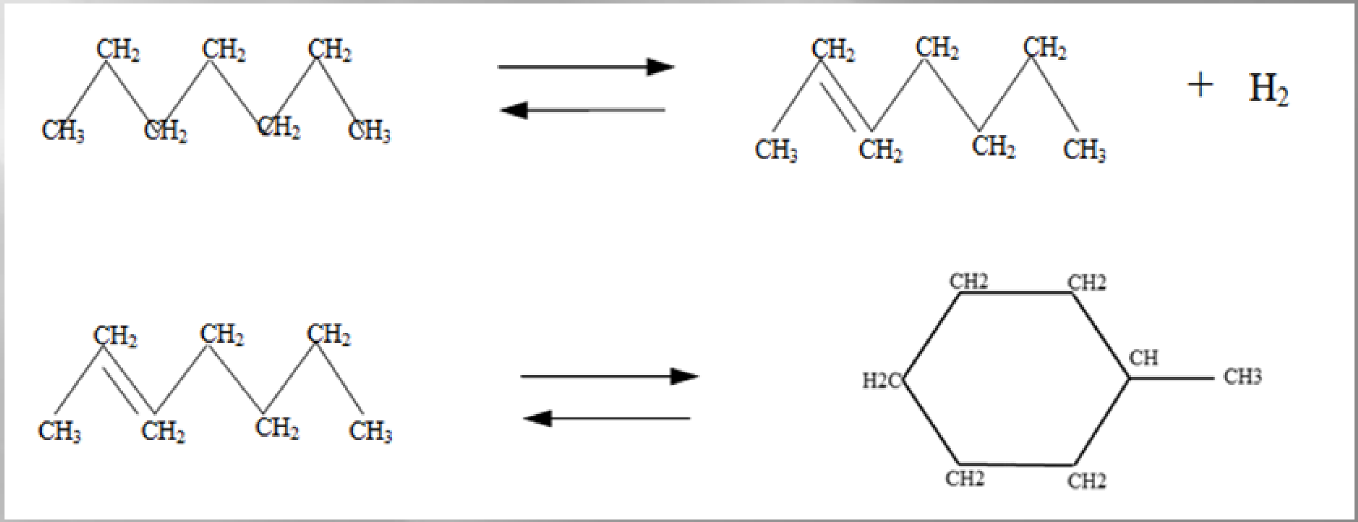


WE NEED :

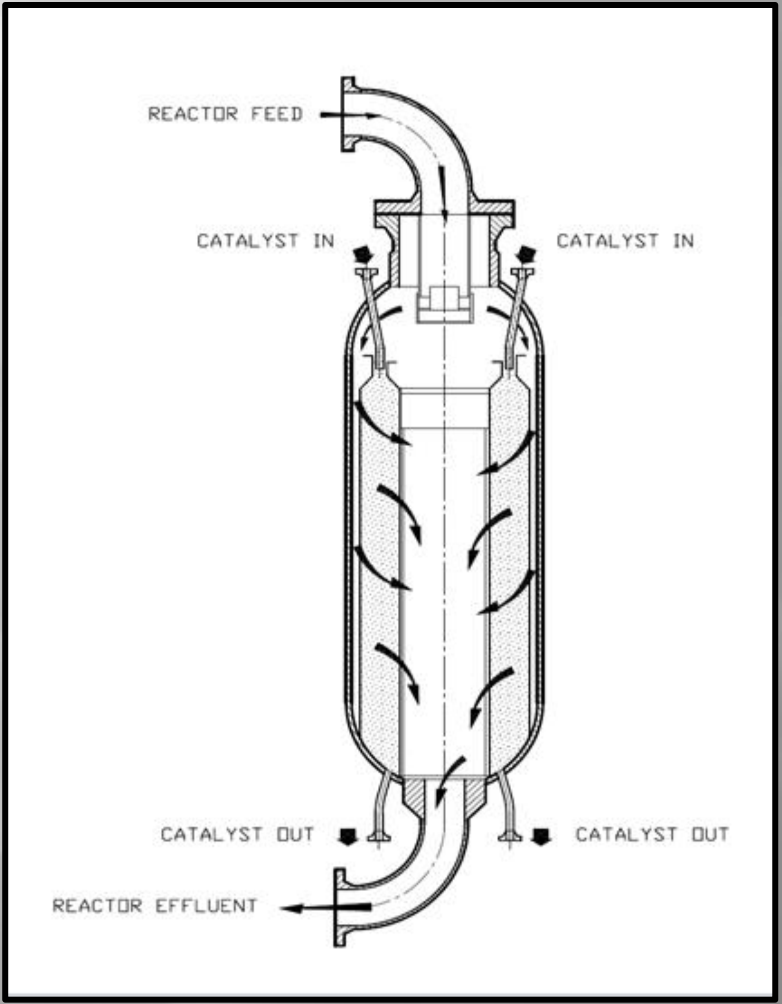
MORE HEAT

ACIDITY ELEMENT + METAL ELEMENT ON CATALYST

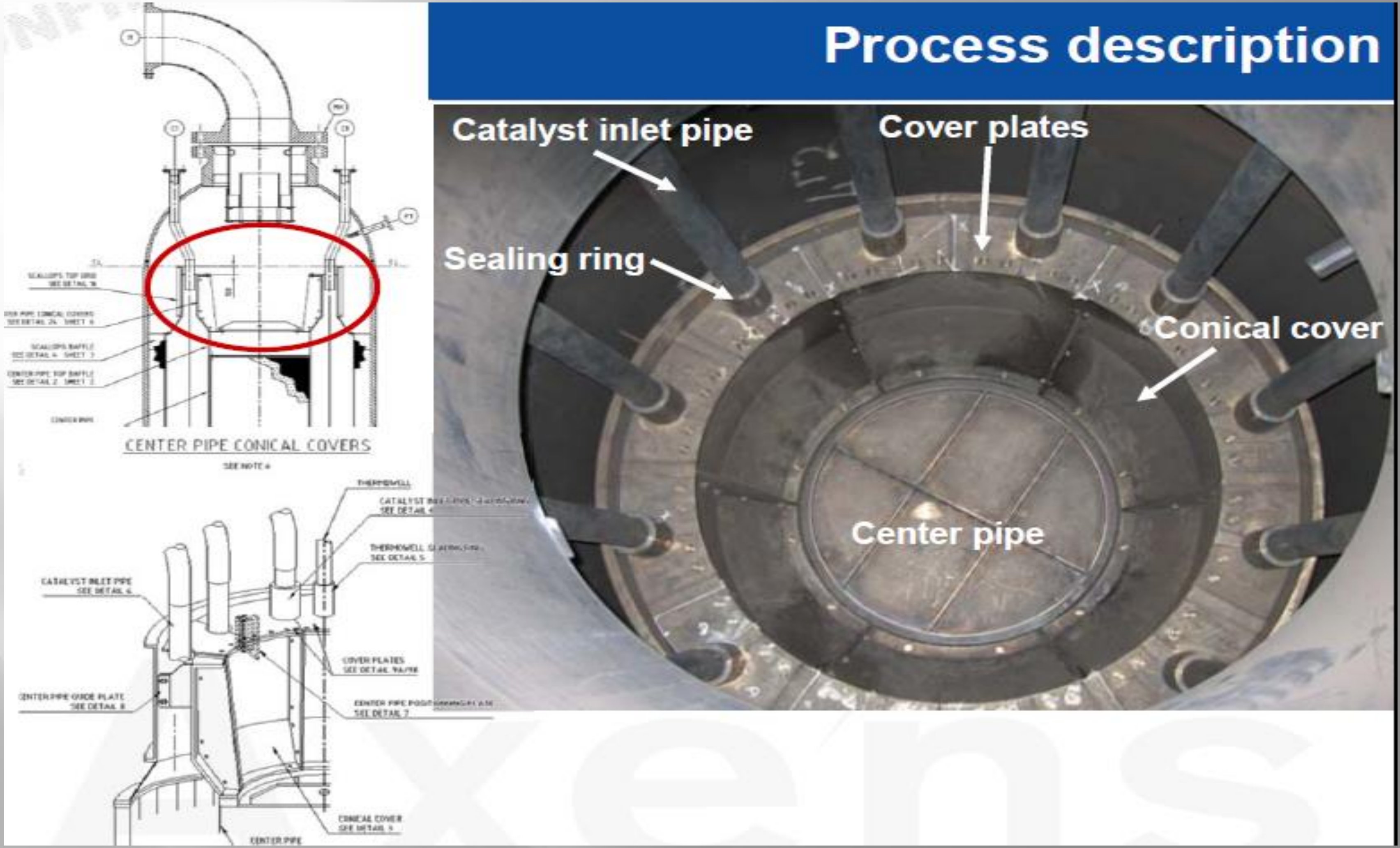

CH2
CH2
H2C
CH
CH3
CH2
CH2
CH
CH
HC
C
CH3
+ 3 H2
CH
CH

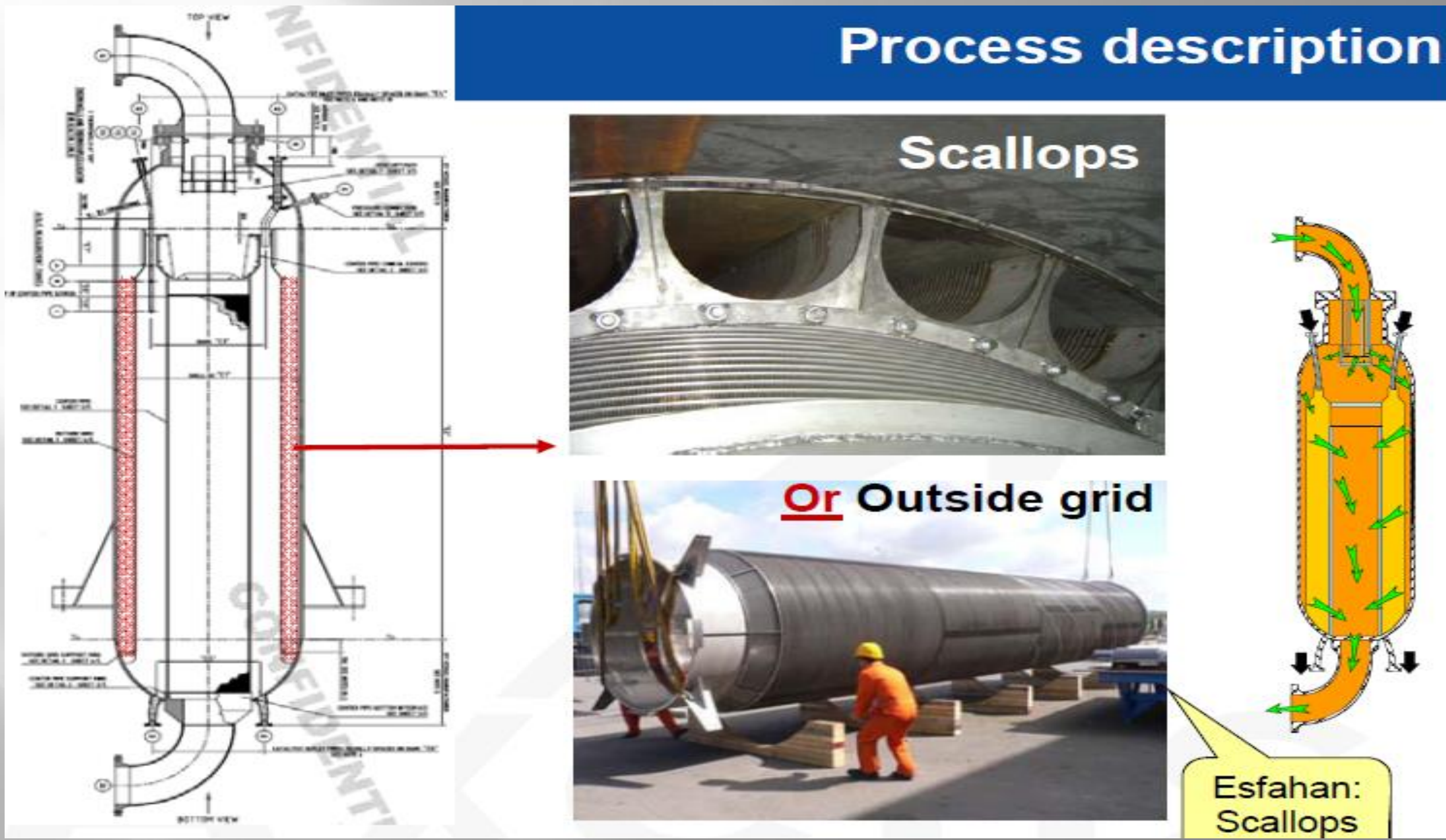

CH2 CH2 CH2
CH3 CH2 CH2 CH3
CH2 CH2 CH2
CH3 CH2 CH2 CH3
+ H2
CH2 CH2 CH2
CH3 CH2 CH2 CH3
CH2
CH2
H2C
CH
CH3
CH2
CH2

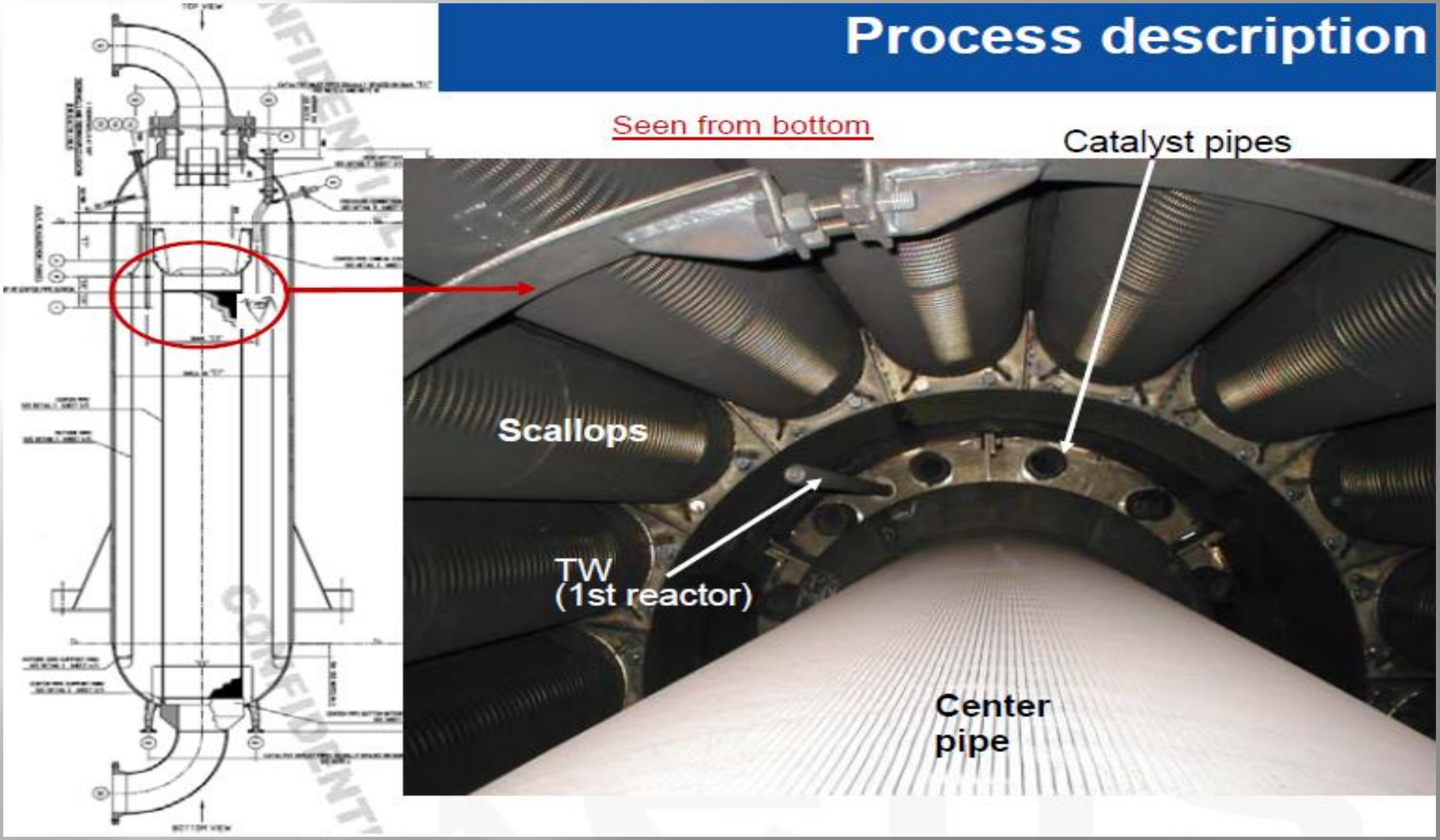
REACTOR



REACTOR FEED
CATALYST IN
CATALYST IN
CATALYST OUT
CATALYST OUT
REACTOR EFFLUENT


Process description
Catalyst inlet pipe
Cover plates
Sealing ring
Conical cover
Center pipe
CENTER PIPE CONICAL COVERS


Process description
Scallops
Or Outside grid
Esfahan:
Scallops


Process description
Seen from bottom
Catalyst pipes
Scallops
TW
(1st reactor)
Center
pipe

Regeneration Reactor

- 1st burning zone:

470°C	≤	inlet T	≤	480°C
535°C	≤	outlet T	≤	545 C

- 2nd burning zone:

470°C	≤	intlet T	≤	480°C
500°C	≤	outlet T	≤	510°C

- Oxychlorination zone

500°C	≤	outlet T	≤	510°C

- Calcination zone:

510°C	≤	outlet T	<	520°C

CATALYST DISTRIBUTION

FIRST 15%

SECOND and THIRD 20-25%

FORTH 40%

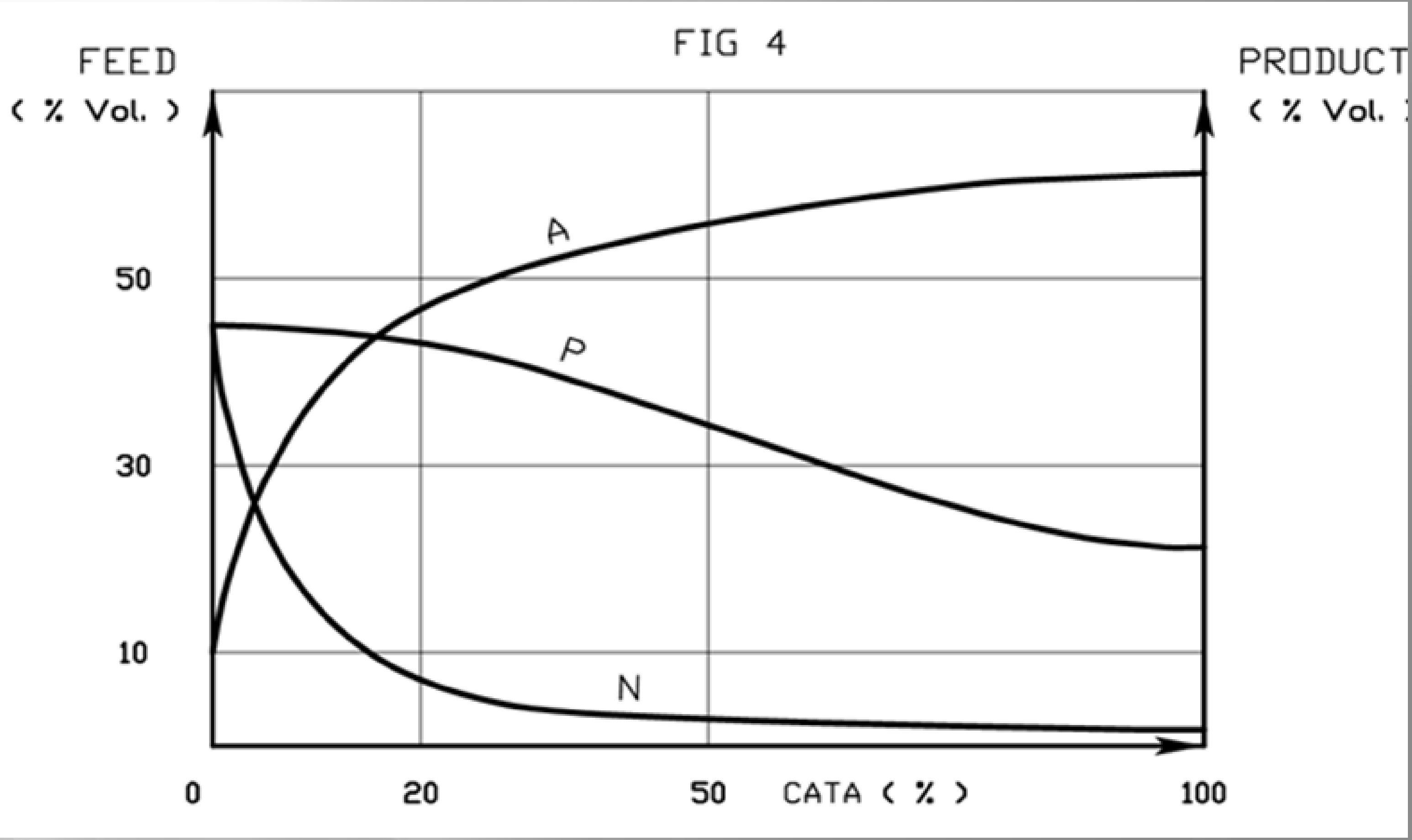


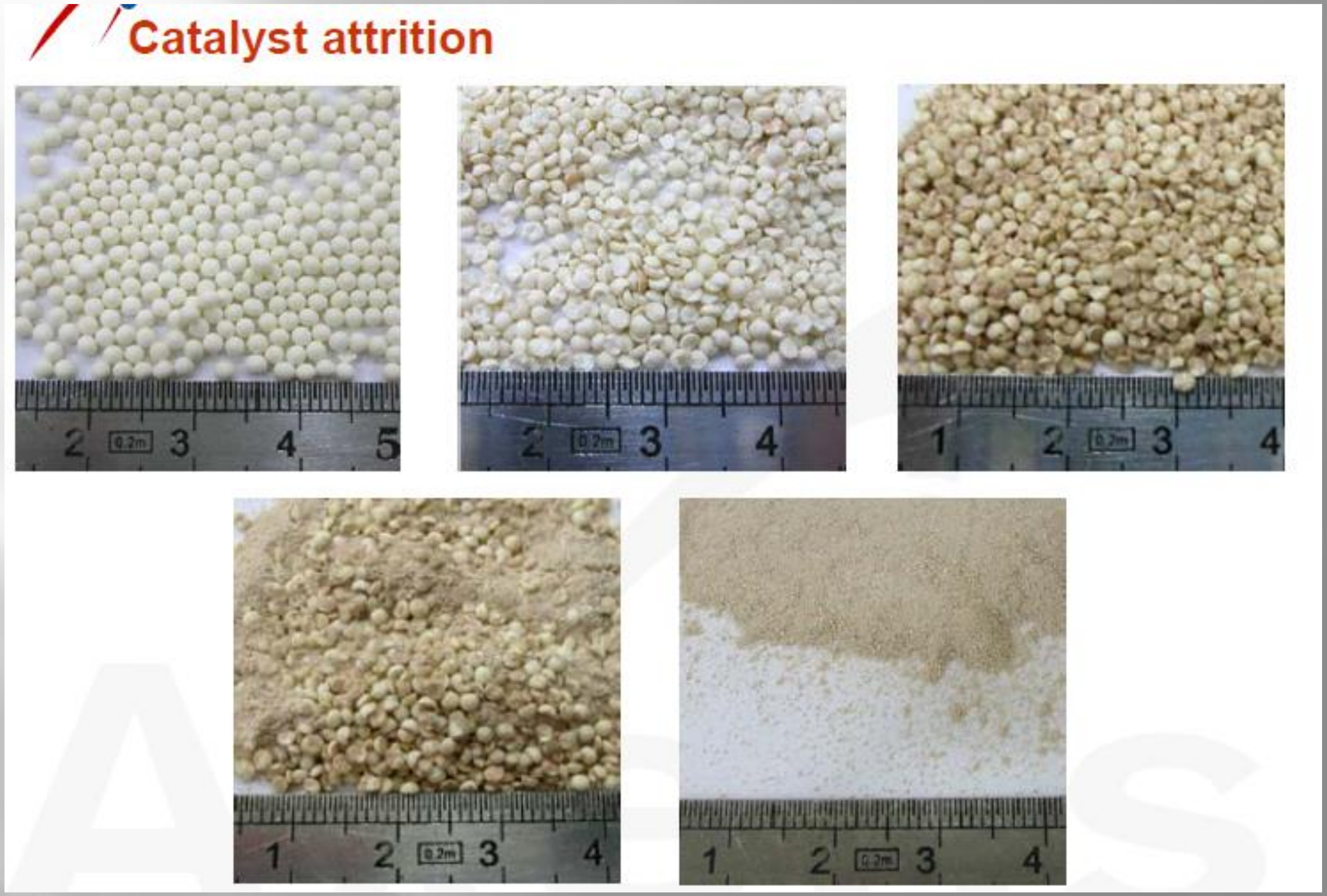
FIG 4
FEED
(% Vol.)
PRODUCT
(% Vol.
50
30
10
A
P
N
0
20
50
CATA (%)
100

CCR CATALYST

Physical Properties of PS-VI Catalyst

Item	PS-VI	Analytical method
Pt/(wt%)	0.28	RIPP 37-90
Bulk Density /(g/ml)	0.57	
Surface Area/(m^2/g)	180~210	RIPP 151-90
Particle Distribution/wt%(1.6±0.2mm)	＞98	
State	Reduced	

CRASHED CATALYST



SIMULATION DONE WITH FOLLOWING ASSUMPTION:

1-CONSTANT CATALYST ACTIVITY

2-IGNORE EFFECTED OF WATER AND

3-SULPHURE OVER CAT.

4-S.S MODE

5-Pt Dispersion Constant

Feed PIONA

Hydrocarbon Totals by Group Type

Type	Wt %	Vol %	Mol %
Total Aromatics	15.130	12.597	14.341
Total C14+	0.016	0.015	0.009
Total Iso-Paraffins	34.306	35.711	32.923
Total Naphthenes	17.571	16.614	17.794
Total Olefins	1.266	1.303	1.290
Total Oxygenates	0.000	0.000	0.000
Total Paraffins	29.901	31.934	32.168
Total Unknowns	1.809	1.826	1.476
Total:	100.00	100.00	100.00

eed and Product (Lab Test)

SAMPLE	Method	Mix Naphtha	Treated L.N	Treated H.N	Stabilized Gasoline
Sp.Gr.60/60 °F	D-1298	0.727	0.6725	0.753	0.806
IBP °C	D-86			96	56
5% Rec °C	D-86			109	88
10% Rec °C	D-86			112	100
30% Rec °C	D-86			117	121
50% Rec °C	D-86			122	134
70% Rec °C	D-86			128	149
90% Rec °C	D-86			137	169
95% Rec °C	D-86			142	182
FBP °C	D-86			166	215
RVP Kpa	D-323				28
RON	D-2699				94
W. Cont. ppm	کارل فیشر				
T. Sulphur ppm	UOP-357		0.4	0.43	
DOCTOR TEST	D-4952		NEG		

PONA %Vol	D-539	N-P	Iso-P	O	N	A
Mix Naphtha						
Treated H.N						
Stabilized Gasoline						

Consideration:

N.SH.B

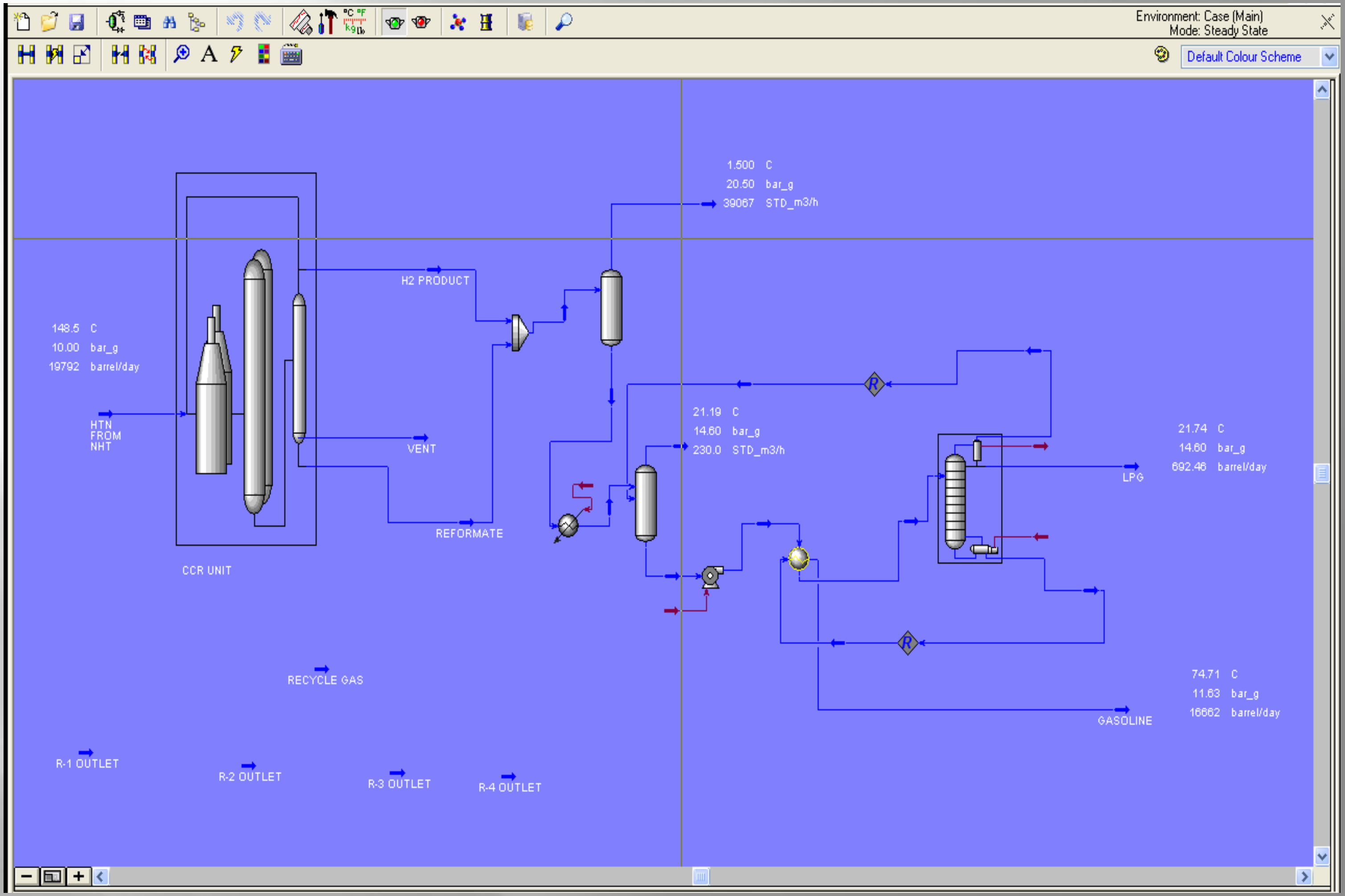
Stabilized Gasolin RON=95.1

	PH	COND
LPC12	9.1	5.6

	H_2O ppm	HCl ppm
Plat Recycle Gas	D-4178	UOP-317

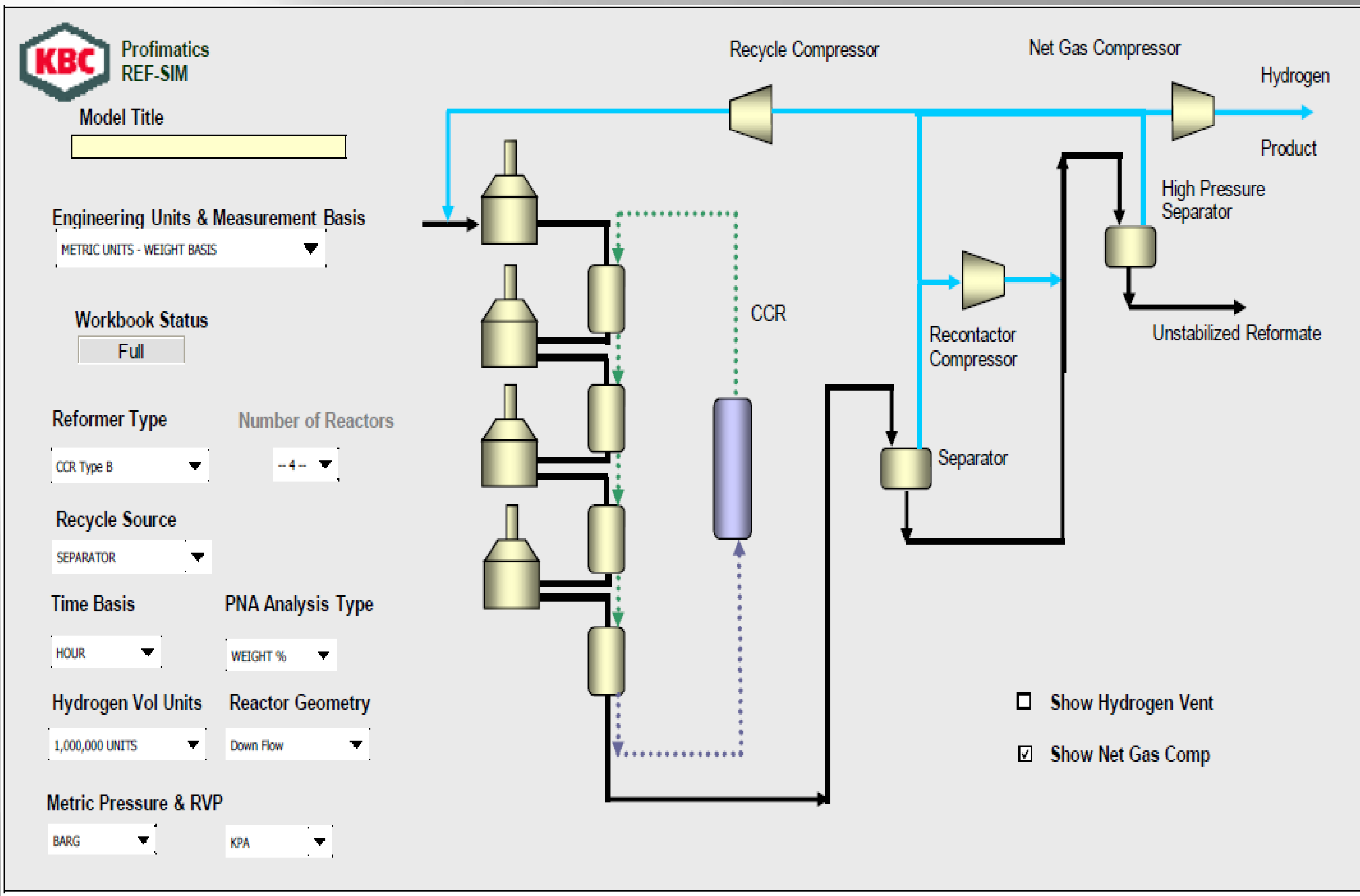
TEST	PH	T. CON. µs/cm	Fe ppm	NaOH %	NH3 ppm	Solid Wt%	Carbon Wt%	ChlorineWt%	
METHOD	D-1293	D-1125	D-1068	D-1121	D-1426	D-1888	UOP 703	UOP 291	
Neutralisation Solution									
Reg.Catalyst							0.05	1.19	
Spent Catalyst							2.8	1.15	

SIMULATION BY PETROSIM



Feed Detail- PIONA

	P	I	O	N	A	
C4	0.102	0	0.01	0	0	0.112
C5	0.529	0.412	0.046	0.048	0	1.035
C6	0.482	0.779	0.052	0.35	0	1.663
C7	7.527	4.971	0.013	7.249	3.653	23.413
C8	7.61	10.322	0.053	4.605	3.887	26.477
C9	6.254	12.2922	0.88	5.56	3.577	28.5632
C10	2.215	8.447	0.059	2.008	3.675	16.404
C11	0.616	0.524	0.054	0	0.083	1.277
C12	0.105	0	0	0	0.005	0.11
C13	0.166	0	0	0	0.003	0.169
C14	0.002	0	0	0	0.002	0.004
UNKNOWN	25.608	37.7472	1.167	19.82	14.885	99.2272


KBC
Profimatics
REF-SIM
Model Title
Engineering Units & Measurement Basis
METRIC UNITS - WEIGHT BASIS
Workbook Status
Full
Reformer Type
CCR Type B
Number of Reactors
-- 4 --
Recycle Source
SEPARATOR
Time Basis
HOUR
PNA Analysis Type
WEIGHT %
Hydrogen Vol Units
1,000,000 UNITS
Reactor Geometry
Down Flow
Metric Pressure & RVP
BARG
KPA
Recycle Compressor
Net Gas Compressor
Hydrogen
Product
High Pressure
Separator
CCR
Recontactor
Compressor
Unstabilized Reformate
Separator
Show Hydrogen Vent
Show Net Gas Comp

Input DCS and Lab result

	A	B	C	D	I	J	K	L	M	N	O	P
1	Calibration Input											
2						Case Number ->	1	2	3	4	5	6
3		RESET ALL RESULTS				Run Case ->	y					
4					Total ->	1						
5	Feedstock					Case Title ->						
6	Fresh Feed 1			---------------	---							
7		Rate			tonne/h		98.4					
8		Naphthenes			wt %		19.82					
9		Aromatics			wt %		15.444					
10												
11		Naphtha type			---							
12		5 ring to 6 ring Naphthene ratio			---		0.92					
13												
14		Distillation			Method							
15		-00%			°C		102					
16		-05% (Optional)			°C		110					
17		-10%			°C		113					
18		-30%			°C		120					
19		-50%			°C		127					
20		-70%			°C		140					
21		-90%			°C		155					
22		-99%			°C		171					
23												
24		Dist and Comp Integration			0=No; 1=Yes							
25												
26		Composition			Type		2					
53												

REASON OF DIFFERENT

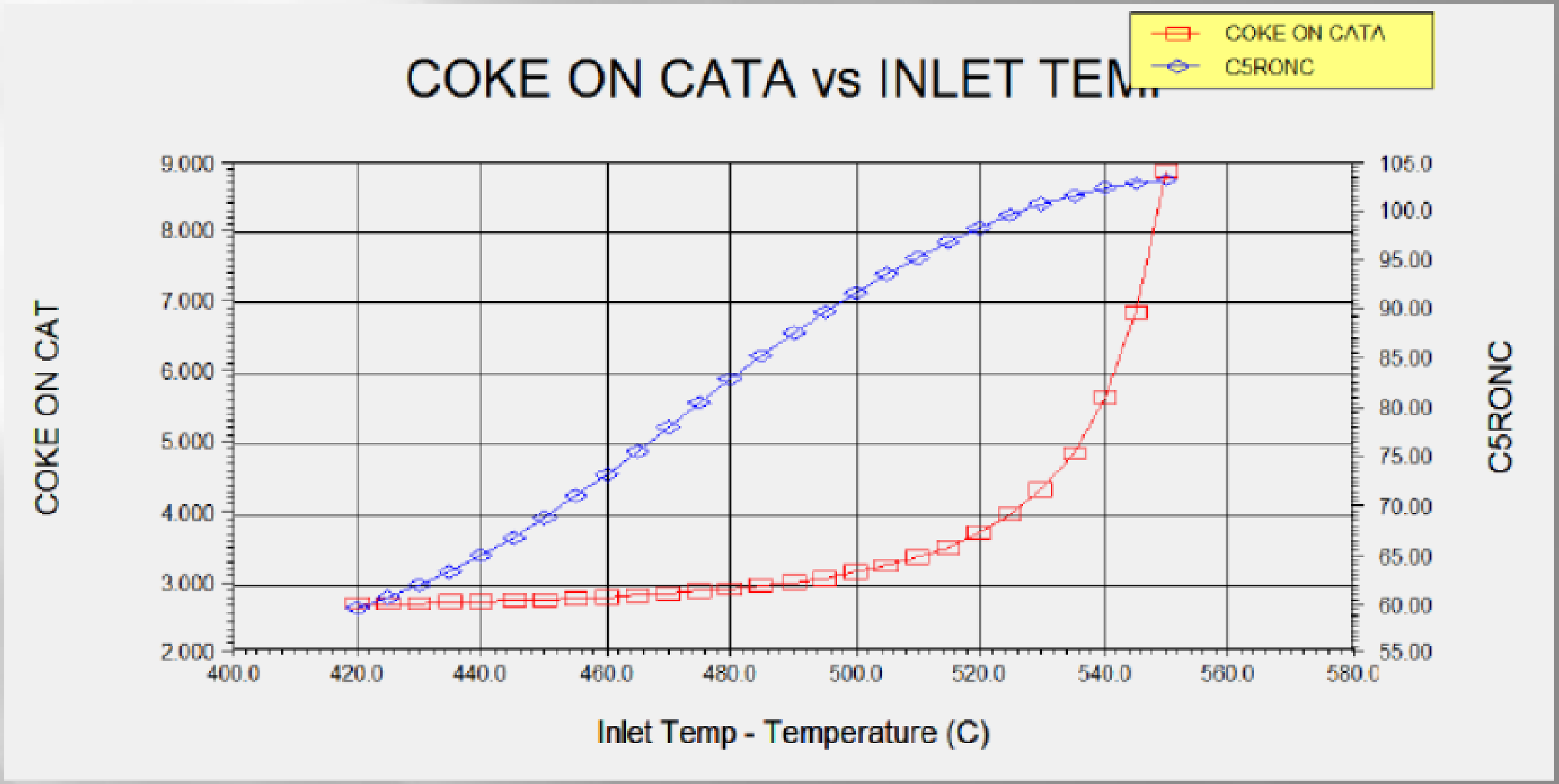
1-INSTRUMENTATION DEFECT

2-LAB ERROE

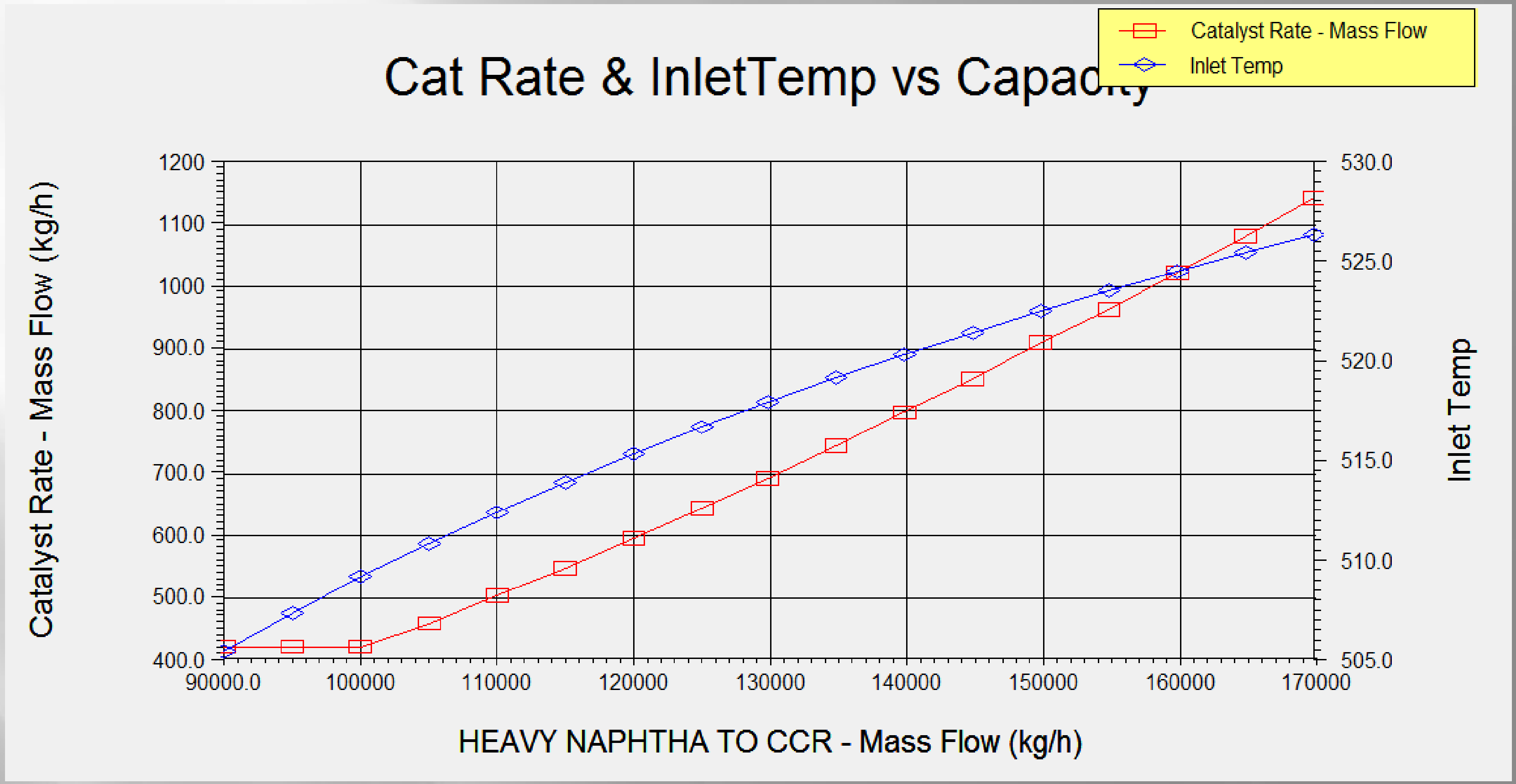
3-SOFT WARE ERROE

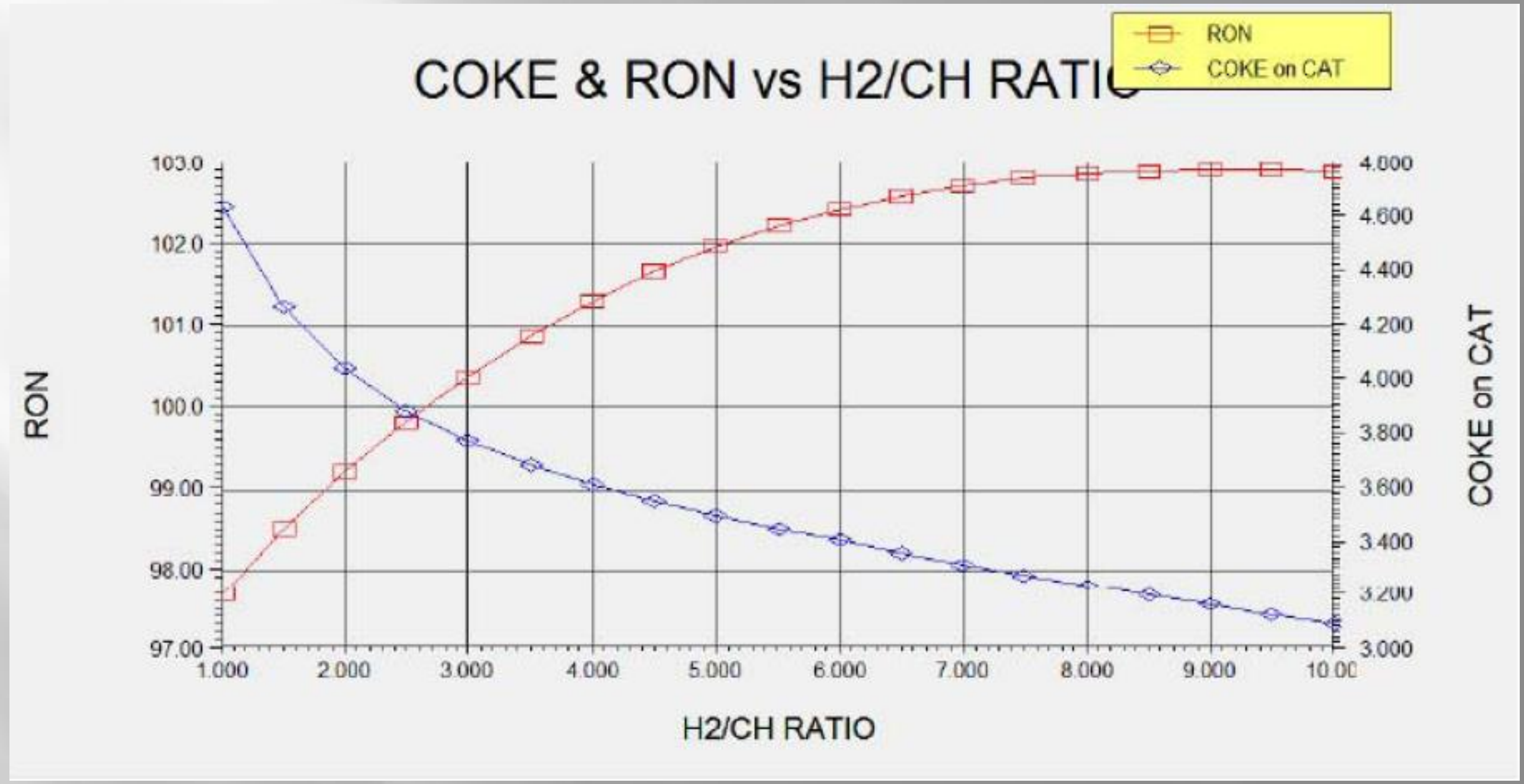
4-NOT COMPLETE RESULT LAB

5- LACK OF $C_{10}{}^{+}$ INFORMATION IN FEED


COKE ON CATA vs INLET TEM
COKE ON CATA
C5RONC
COKE ON CAT
C5RONC
Inlet Temp - Temperature (C)
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
105.0
100.0
95.00
90.00
85.00
80.00
75.00
70.00
65.00
60.00
55.00
400.0
420.0
440.0
460.0
480.0
500.0
520.0
540.0
560.0
580.0

RON=99 and Coke = 3.5%



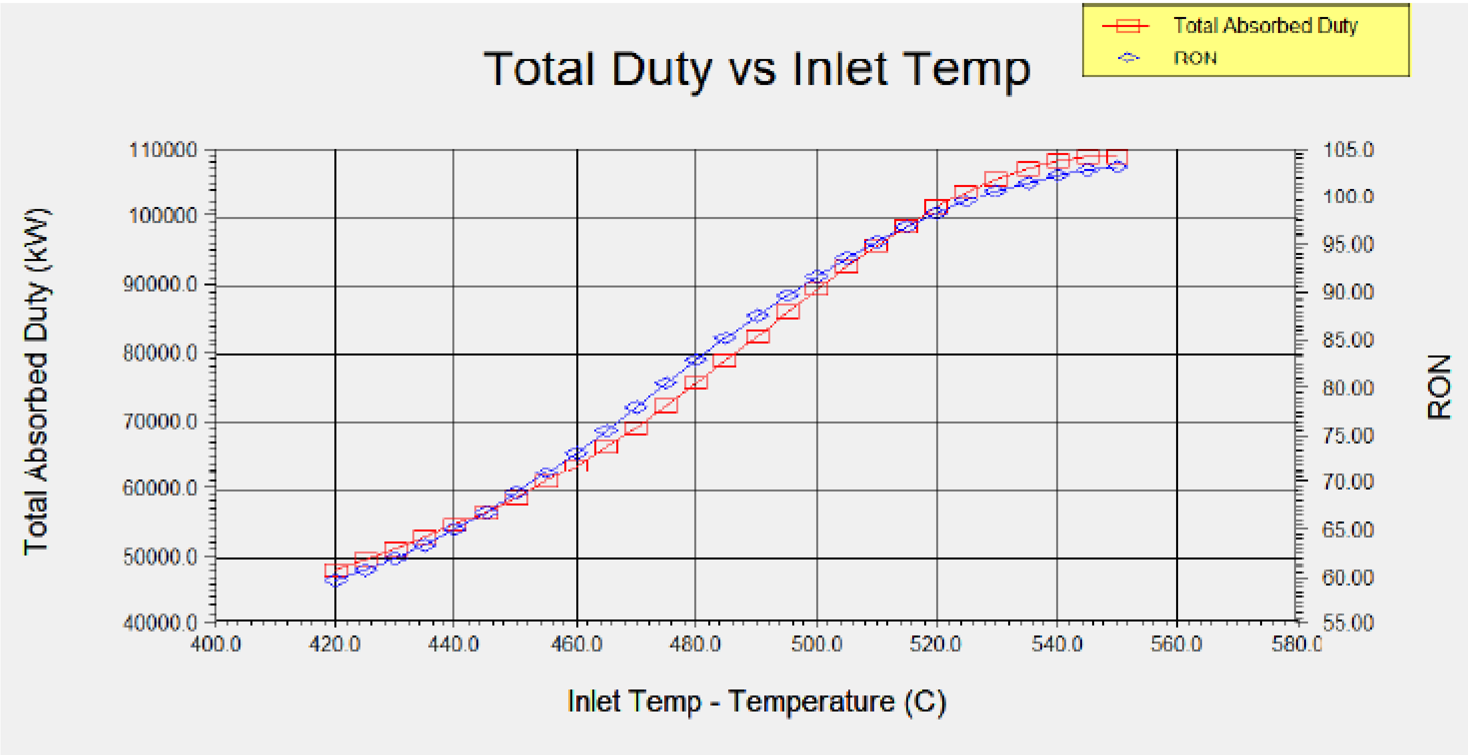

COKE & RON vs H2/CH RATIO
RON
COKE on CAT
103.0
102.0
101.0
100.0
99.00
98.00
97.00
1.000
2.000
3.000
4.000
5.000
6.000
7.000
8.000
9.000
10.00
4.800
4.600
4.400
4.200
4.000
3.800
3.600
3.400
3.200
3.000
H2/CH RATIO
COKE on CAT

Axens believe in this H_2/HC has no any effect on RON ?

Effect of process variables

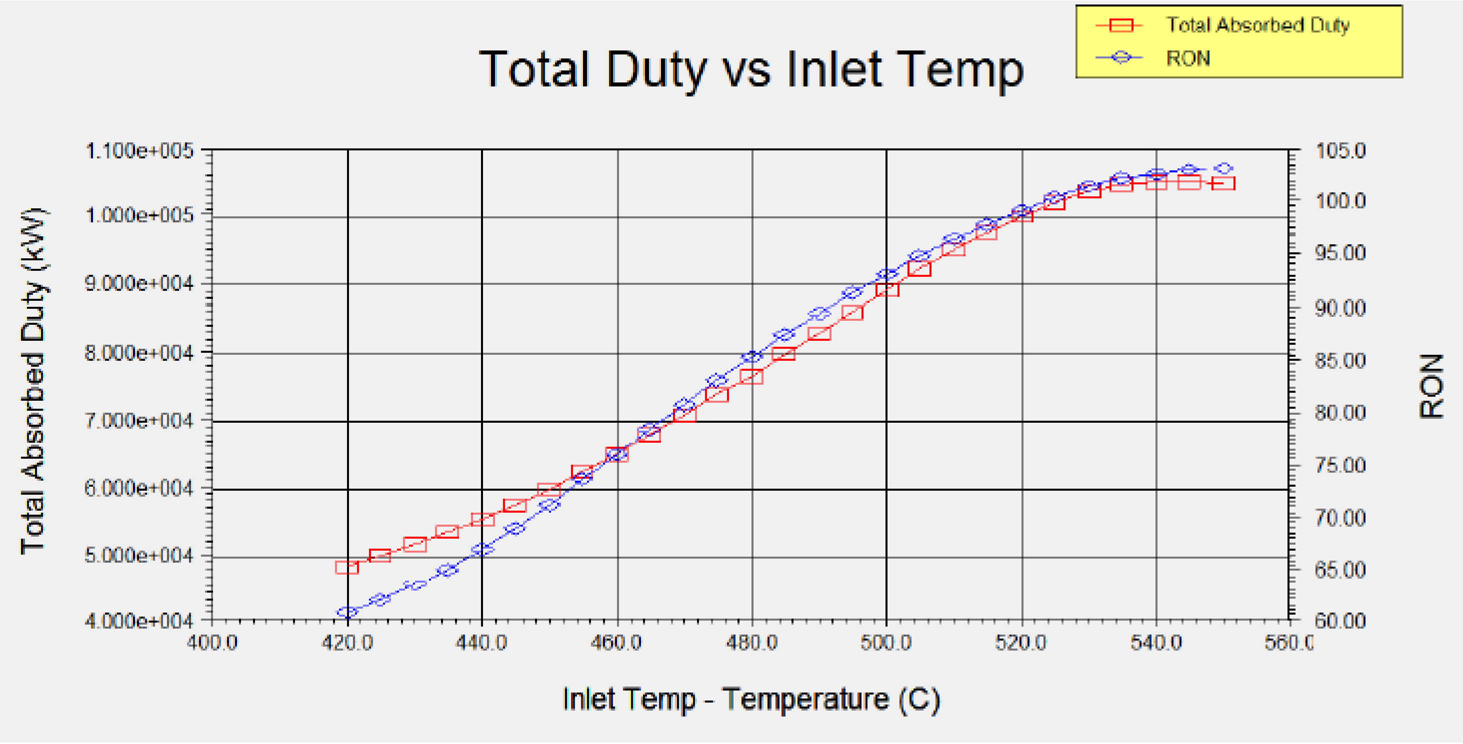
Increased		***RONC***	***Reformate yield***	***H_2 yield***	***Coke deposit***
Pressure		↘	↘	↘	↘
Temperature		↗	↘	↗	↗
Space velocity		↘	↗	↘	↘
H_2/HC ratio		→	→	→	↘
Naphtha Quality	*A + 0.85 N*	↗	↗	↗	↘
	End boiling point	↗	↗	→	↗
	Initial boiling point	↗	↗	↗	↘

بررسی تأثیر تغییرات دمای ورودی راکتورها بر مقدار مصرف انرژی کوره های واحد تبدیل کاتالیستی



INCREASE 1 RON NEEDED 930 KW ENERGY

بهینه سازی مصرف انرژی با هدف تثبیت عدد اکتان ۱۰۰ در ظرفیت اسمی واحد تبدیل کاتالیستی احیاء پیوسته



Effect of splitter temperature bottom and IBP on RON and Yield

Benzene in Reformate	RON	FEED FBP	FEED IBP	Splitter Bottom Temp.
8.546	96.15	160.5	53.56	**130**
6.751	97.12	161.8	88.65	**135**
5.175	97.84	162.6	92.57	**139**
3.958	98.26	163.1	93.46	**142**
1.34	98.91	162.6	100.5	**147**
0.7475	99.47	164.5	105	**150**
0.5686	99.79	165.2	106	**153**
0.3335	100.2	166.3	110	**157**
0.2238	100.5	166.6	113.3	**160**

Introduction

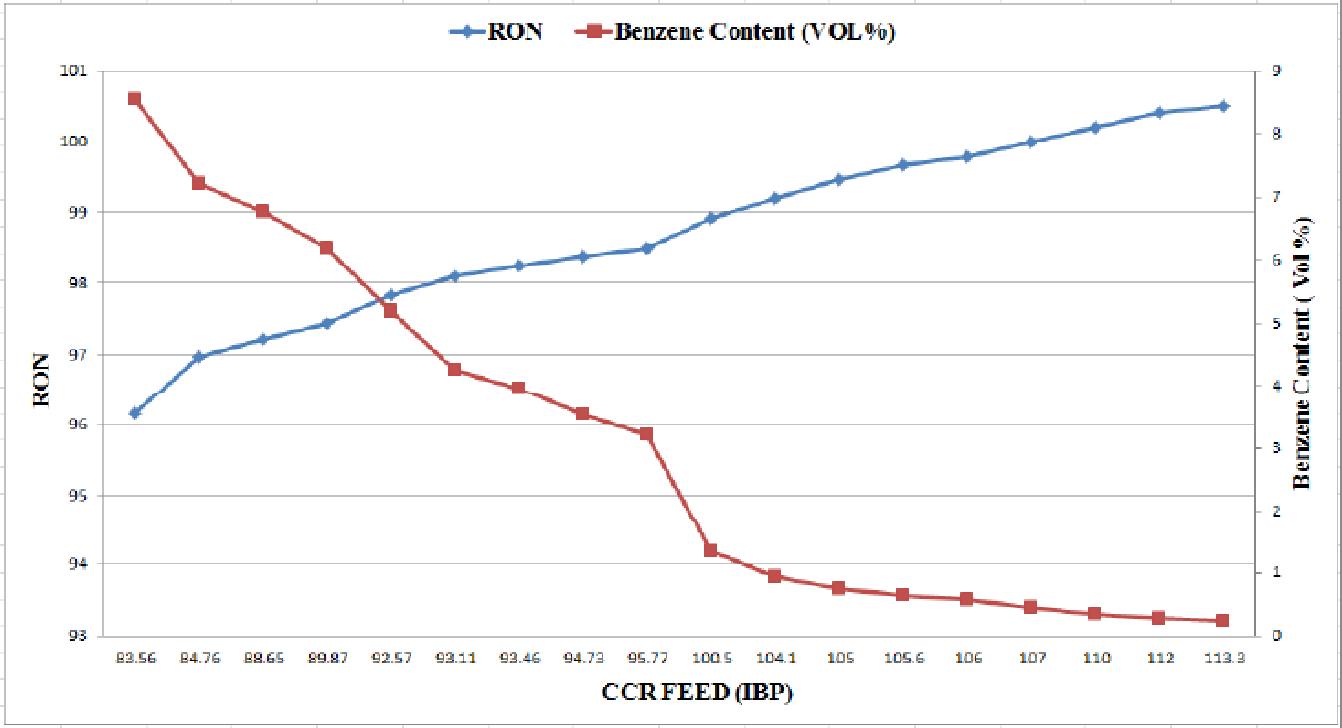
Source: IFQC, WWFC

European Gasoline specifications trends

	EN 228 1993 Euro II	Dir 98/70 2000 Euro III	Dir 98/70 2005 Euro IV	Dir 98/70 2009 Euro V (Final Proposal)	WWFC Fourth Category
Aromatics, vol%, max	-	42	35	35	35
Olefins , vol%, max	-	18	18	18	10
Benzene, vol%, max	5.0	1.0	1.0	1.0	1.0
Oxygen, wt%, max	-	2.7	2.7	2.7/3.7 (2)	2.7
Sulfur, ppm, max	500	150	50(10) (1)	10	5-10
RVP, kPa	35 - 100	60.0 / 70.0	60.0 / 70.0	60.0 / 70.0 (3)	
Lead, g/l max	0.013	None	None	None	None

(1) 2005 introduction of 10ppm sulphur – Fuel must be geographically available in an appropriately balanced manner
(2) 3.7% by mass in "high biofuel petrol" (Methanol: 3% vol, Ethanol: 10% vol, Iso-propyl alcohol: 12% vol, Tert-butyl alcohol: 15% vol, Iso-butyl alcohol: 15% vol, ETBE: 22%vol, other oxygenates: 15%vol)
(3) The legal vapor pressure limit remains at 60kPa for both gasoline grades and at 70kPa for Member States with arctic or severe weather conditions. However, blending ethanol in gasoline results in a non-linear change of the vapor pressure, and, as oil refiners do not currently produce low vapor pressure gasoline, the commission has introduced a permitted vapor pressure waiver that is directly linkedto the percentage of ethanol blended in gasoline (ranging from 0 vol% to 10 vol%).

بررسی تأثیر تغییرات در مقادیر تقطیر خوراک واحد تبدیل کاتالیستی احیاء پیوسته بر عدد اکتان و میزان درصد حجمی بنزن محصول بنزین تولیدی



Optimization Results for 20000 BPSD

Inlet Temperature= 512°C

Mol H_2/mol feed= 2.5

CL on the catalyst = 1.05 wt

Catalyst Circulation rate=550Kg/hr

Splitter Bottom Temperature= 152 °C

Coke on Catalyst= 3.5Wt%

Advice

- 1- Despite of Axens advise , we believe in this H_2/HC effects on RON

increasing this ratio acts as heat source and increase the average bed temperature.

So RON increase too

In simulation and actual test, we have proved this effect

Advice

2- if the coke on the catalyst is less than 4wt% , control system decrease Injected Air to the Calcinations section and the oxygen content in oxychlorination zone decrease below 4vol% then re-dispersion of the Pt on the catalyst decrease subsequently.