# RECOPE

## Feasibility Study – RPMS LP Findings

## Latest Set of Reports - Case 10

**April 14, 2011**

Honeywell

# LP Findings - Topics

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- **Gasoline Blending E95 & E91**
- **Process Units Simplistic Representation Still an Issue for Delayed Coker Unit, Hydrocracking Unit & Platforming Unit**
- **Platforming Unit Hardwire Reformate Yields - Illustration for Case 6 through 10**

# E95 Gasoline Blending

# E95 Gasoline Blending

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- **The attempt to model Additive MMT has been removed**

- **Min RON specification of 95 is achieved by**
  - **Making modifications and adjusting blend gasoline properties**
    - For Reformate (CCR) : RON has been decreased from 98 to 97
    - For Reformate (CCR) : ARO has been decreased from 65 to 62
    - For HCU Light Naphtha (HLN) : RON has been increased from 76 to 82
    - Isomerate (ISO) :  RON has been increased from 80 to 83
  - **Removing Max OXY gasoline specification of 2.7%. By doing this Ethanol blend component is increased from 7.8 to 15% volume. Is this realistic?**

# E91 Gasoline is Blended Now

- **Very big RON quality giveaway in regular E91 Gasoline.**
- **RON Quality is 94.826 vs Min Spec of 91**

# LP Modeling of Process Units

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- **The RPMS LP model representation of the main process units is extremely simplistic**
  - **Yields are not adjusted by changes in property of the feed**
  - **Yields are not adjusted due to changes in operation conditions**
  - **Structures to control recursion & tracking missing or completely ignore**

- **In reality the LP model technology is not flexible and robust enough to handle different multiple alternatives & scenarios. On the contrary the LP structures are rigid (hard wire) : yields are predetermine for each particular case, which in turn is directly linked to the the crude, and properties do not change as the hard wire yields changed from case to case (e.g Platformer Unit)**

# RPMS Platforming (WCCR) – Predetermine Representation

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| General Observations regarding RPMS Platforming Unit - Case 6 Through 10 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Reformer yields, wt% | | | | Reformate properties | |
| Case no | Solution N2A Feedstock | Gas Yield, wt% | LPG Yield, wt% | Reformate Yield, wt% | H2 yield, wt% | Reformate RON | Reformate ARO |
| 6 | 68.00 | 7.20 | 2.00 | 88.00 | 2.80 | 97.00 | 62.00 |
| 7 | 53.14 | 9.40 | 3.20 | 84.80 | 2.60 | 97.00 | 62.00 |
| 8 | 69.84 | 6.90 | 1.80 | 88.40 | 2.90 | 97.00 | 62.00 |
| 9 | 60.44 | 8.30 | 2.60 | 86.40 | 2.70 | 97.00 | 62.00 |
| 10 | 54.97 | 8.50 | 2.70 | 86.10 | 2.70 | 97.00 | 62.00 |

- **Even though the reformate yields are hard wire for each particular case, there is a relationship N2A feed & yield – No specifically model in the RPMS model. However, the ARO property of the reformate remains constant (?) as the yields change**
- **Above representation is not a best practice as the LP model is not flexible and robust enough**
- **The RPMS model should properly achieve its stated purpose under normal circumstances and the model's structural integrity should remain intact and properly represent the operations at the refinery when subjected to expected and reasonable deviations from normal. This of course will not be accomplished with current approach used as it is not represented in all the process units of the RPMS model!**

# General Table OPTIONS (DEBUG = 2)

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- This recommendation was followed mainly with the approach of making the model to run. Distribution and tracking structures intersections were left empties (e.g. Fresh Feed) at major process units