

What's New in H-Oil Offers? Advance Services



Delphine Le Bars

H-Oil[®] Services Offer

■ Training / Refresher-Training

- Classroom
- Dynamic & static simulators
- Site training

■ Operation Support

- Audit
- Web-based model (WebPOS™)
- SCS Package

H-Oil® Services Offer

■ Training / Refresher-Training

- Classroom
- Dynamic & static simulators
- Site training

■ Operation Support

- Audit
- Web-based model (WebPOS™)
- SCS Package

Axens Training Offer

Target Educational Excellence with Solid Foundations



Customised for effective and targeted training

Backed by **complete knowledge** of the design, the operation and the troubleshooting of your unit



Experts in the Field with First-class Educational Skills

Training sessions prepared and customized by our **in-house experts** and our **Start-up Advisors**



Industrial Feedback: Decades of Experience

Courses based on the most recent good operating practices, **based on unit follow-up** and tricks to improve efficiency and performance

Axens Training Offer

A Customer-orientated Approach

- **Customized** courses specifically developed to serve our licensees
- Two different offers: **Pre Start-up** and **Refresher Training**
- For **all** Axens' technologies, especially:

H-Oil[®]_{RC}



Resid
Hydroconversion

SolvahI[™]



Solvent
Deasphalting unit

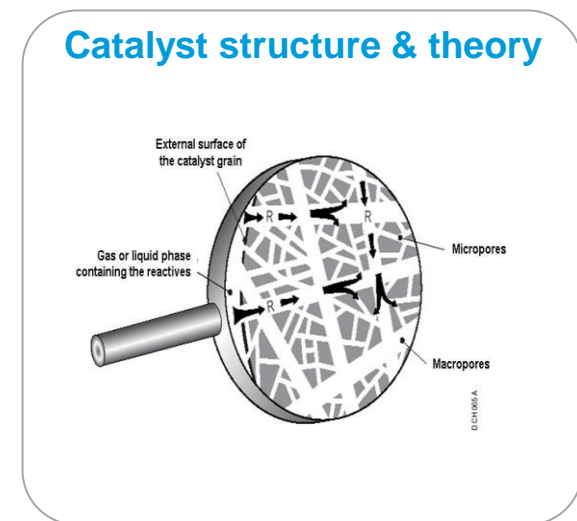
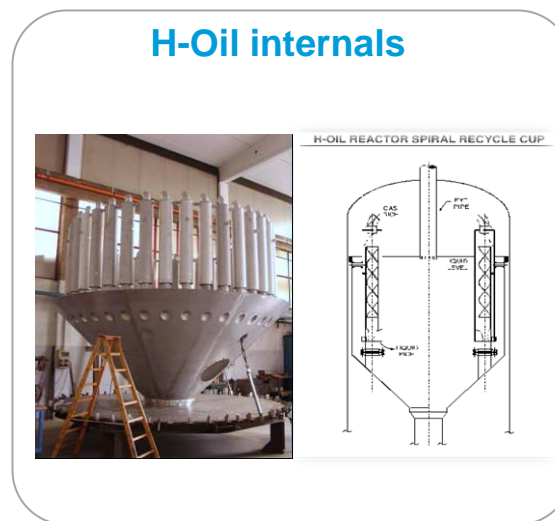
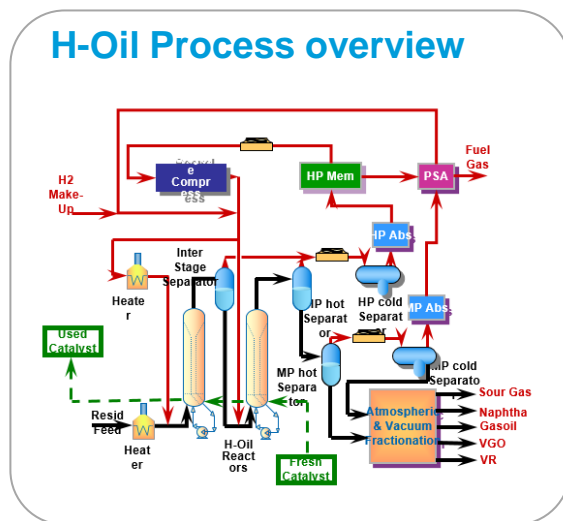
Axens Training Offer H-Oil Initial Start-up

- Refiners additional specific challenges
 - Many **newcomers** requiring technology knowledge
 - **Tight** start-up schedule
 - **Safety** concerns (very high temperature and pressure, circulating catalyst, H₂ and H₂S involved, etc.)

- Axens Training Targets
 - Make Operators & Engineers **self confident** with future start-up and operation of the unit
 - Highlight on **safety procedures** and **safety devices** foreseen in the design of the unit
 - Ensure unit **behavior** understanding

Axens Training Offer Pre-Start-Up Training Strategy

- Tailor made Programs for each customers: **Theory & On-site**
- Theory, from the basics...to the details
 - › General background: economics, purpose, products, a general process review...
 - › Detailed process description: equipments, internals, operational parameters
- Heart of the technology
 - › Basis of the chemistry and thermodynamics, to explain reactions happening in the reactor.



Axens Training Offer Classroom Session

- **Start-up & Shutdown operations**

- › The aim is to familiarize with pre-commissioning / commissioning activities and how to start-up and shutdown the unit.

- **Troubleshooting**

- › To be aware of the risks and solutions regarding upsets of the unit, and the automatic emergencies procedures.

Start-up steps description

Start-up Diagram for both Sections

Reaction Section	Main Fractionator / Gas Recovery Sections
Blower start-up and checks	Complete inerting
Refractory dry-out (first start-up only)	Water filling
Refractory inspection (first start-up only)	Amine Absorbers filling
Catalyst hoppers loading (first start-up only)	Flushing oil sections filling
Unit warm-up	Feed Preheat and Main Fractionator section filling
Torch oil system preparation	Cold circulation
Catalyst loading	Hot circulation / unit heat-up
Main Fractionator Blind Removal (Fractionator Inlet Isolation Valve still closed)	
Restart Hot Circulation and Wet Gas Compressor	
Opening of Fractionator Inlet Isolation Valve	
Establishing catalyst circulation	Hot circulation
Oil-in	
Final start-up operation	

Leak tests during initial start-up

Leak Tests: tape method

Soap and tape



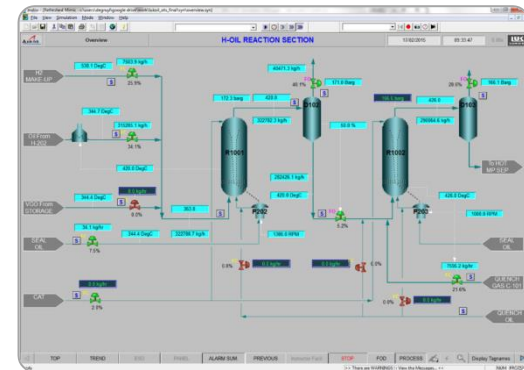
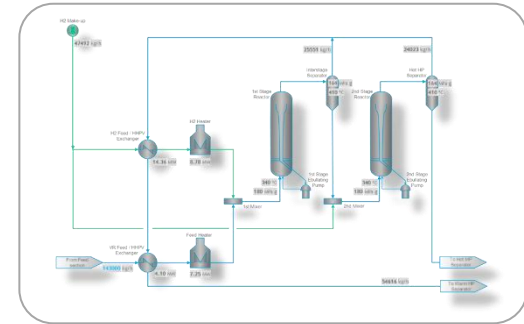
Illustrated coke formation



Axens Training Offer

Training on Simulators: 2 Different Tools

- **Process Operations Simulator (POS)**
 - › Off-line or Web application for what-if studies and plant performance monitoring
- **Operator Training Simulator (OTS)**
 - › A true dynamic simulator dedicated to train operators to normal and upset conditions



- Support theoretical lessons with illustrative case studies based on Client' site data
- Explain complex phenomena through exercises and case studies
- Improve skills in the relationship between operating parameters and unit performances

Axens Training Offer Pre-Start-Up – On-Site Training / Burgas Example

- **Challenge**
 - Train Operators on new operation concept (Ebullated bed)
 - Understand Feeds & Products characteristics
- **Training Organisation**
 - 20 Trainees integrated in Shift Operator Teams during 1 week in Poland Refinery
- **Excellent Feedbacks**
 - Participation in special operations (sampling, Lab analysis, Feed pumps switch, Catalyst addition and draw-off, MUC switch)
 - Experience shared with Partner refinery (start-up, daily operation and tools, troubleshooting)



Axens Training Offer

Next start-up training – from 4th to 29th Septembre

■ ZRCC



■ Training Organisation

- 13 Trainees during 4 weeks

■ Classroom training – 2 weeks – Rueil Malmaison

- Train Operators on new operation concept (Ebullated bed)
- Understand Feeds & Products characteristics

■ On site- training – 2 weeks – Bourgas Refinery

- Integration in Shift Operator Teams
- Participation in special operations (sampling, Lab analysis, Feed pumps switch, Catalyst addition and draw-off, MUC switch)
- Experience shared with Partner refinery (start-up, daily operation and tools, troubleshooting)



Axens Training Offer Conclusions

Worldwide proved with more than 600 trainees per year...



...with excellent feedback from customers...

- EVALUATION FORM -



1 - What is your overall impression of the training course?

Excellent Very good Good Fair Poor

2 - Give your overall comments on the following points:

• Technical content of the course

Excellent

• Balance between the different subjects

Very good

• General organization (duration, schedule, etc...)

Excellent

3 - Do you consider the training course professionally useful? Please elaborate.

YES

...fully customized to your needs



H-Oil® Services Offer

- Training / Refresher-Training
 - Classroom
 - Dynamic & static simulators
 - Site training

- **Operation Support**
 - **Audit**
 - **Web-based model (WebPOS™)**
 - **SCS Package**

Axens Operation Support AUDIT Service

■ Objectives

- Review operation and performances of the unit in order to comment on specific issues such as:
 - › Unit reliability
 - › Fuel Oil stability

■ Scope of Work

- › Review of Past Operations, Performance and Reliability Data
- › Axens Review of Plant and Development of questions
- › Site visit: Inspection, Circuits checking, preventive Maintenance
- › Instrumentation review
- › Data Review, Recommendations and Report

■ References: 2

- › Tula & Convent

Axens
IFP Group Technologies

Job Number 04748

MOTIVA ENTERPRISES LLC
CONVENT LOUISIANA REFINERY

**H-OIL PROCESS OPERATIONAL AND
PERFORMANCE AUDIT**

FINAL REPORT

Rev.	Date	Prepared by	Checked by	Approved by	Comments
0	11/26/11	Name: D.deGruyl K.Tasker J.E.Duddy J.B.MacArthur	Name: J. E. Duddy	Name: J.B.MacArthur	

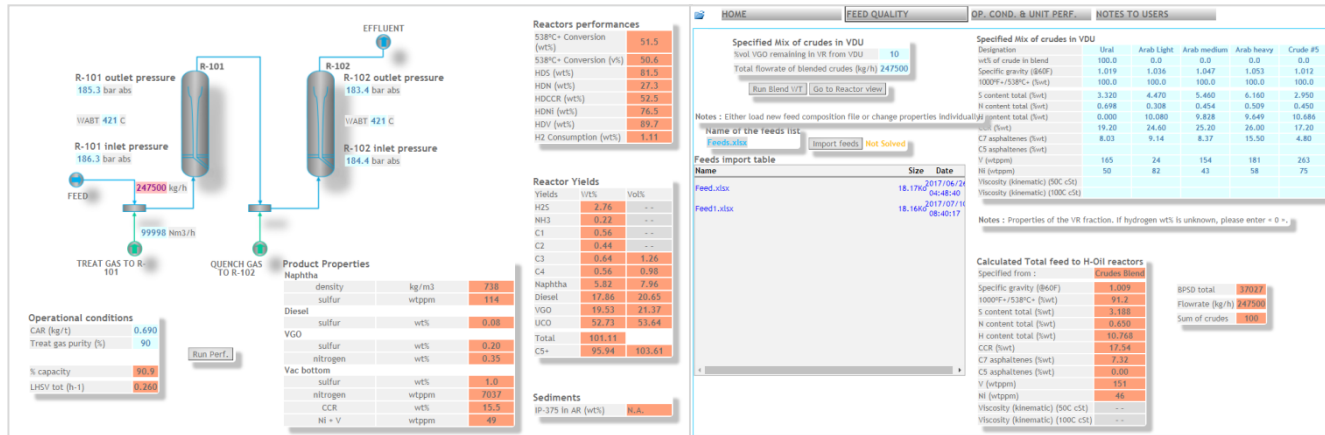
This document contains confidential proprietary material belonging to Axens which may only be made available to personnel or organizations who have signed appropriate secrecy agreements.

Axens Operation Support Web-based Model (WebPOS™)

- Predictive tool based on Axens know-how
 - Derived from Axens « H-Oil Universal Process Model »
- Fine-tuned to **match unit's operation and configuration**
- Enriched by **operation feedback**
- **Inputs:** feed and diluents composition, flow rates
- **Outputs:** performances, yields, product properties

Axens Operation Support Web-based Model (WebPOS™)

- Access through internet interface



- Helps in selecting appropriate crude and operating conditions while maintaining operability

› Decision-support software

- On-going work on sedimentation prediction

Axens H-Oil[®] SCS Package Benefits

On Project Phase

- **Package 3 in 1:**
 - › Catalyst Addition/withdrawal Sequence
 - › Ebullating Bed level control
 - › Process Parameters Advanced Control
- **Single Interface (User ↔ Axens):**
 - › Easier communication, engineering time saving
- **Continuous Axens Involvement:**
 - › Implementation and test
 - › Training
 - › Technical assistance on site
 - › Follow-up during operation

On Process Performance

- **Implementation By Axens :**
 - › Avoids misunderstanding by other parts that could lead to start-up/process/performance issues
 - › Ensures having up-to-date system based on Axens Know-How
 - › Ensures having flexible system customed for easier operation
 - › Ensures having displays reflecting important process parameters

Catalyst Addition/Withdrawal sequence	Ebullating Bed Level control	WABT Management System
Ensures Constant Catalyst Activity	Avoids process / operation / safety issue	Ensures unit stability, performance maximization

Together from Idea to Birth and Forever



Feasibility study
& Technologies
choice

Follow up during EPC
(3D review...)



Thank you! And see you on Axens' Blog axens.net/blog

