

*Naphthenic Acids Corrosion (Opportunity crudes)

Opportunity Crudes

Refiners continuously investigate ways to safely include more 'acid crudes' in the blends being processed. By purchasing such 'cheaper' so-called opportunity crudes, operators have to deal with highly corrosive Naphthenic acids which may lead to drastic corrosion rates on transfer line, piping and vessels.

Today's challenge

This is the challenging goal for the operators to right balance profits and safe processing operating by implementing proper crudes blending, corrosion monitoring, material suitable spec., chemical passivation.



Our proposal: NeuroNAC®-JIP

Development of an innovative & reliable model for NAC prediction

Why Neural Network?

NAC consists in a pool of relatively simple phenomena leading to a complex combined effect. Therefore, global behavior can be efficiently simulated neither by linear functions nor parametric studies. This is the ANN (Artificial Neural Network) superior capability to interconnect and compute these interfacing parameters and combined effects through complex system management.

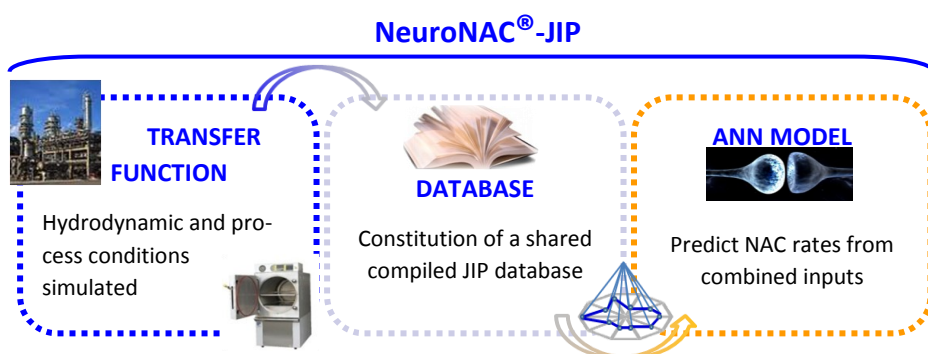
Innovative Modeling Methods

The internal structure and suitable algorithms of the model are implemented by Neural Architects from corrosion expert inputs, laboratory and industry databases.

Which benefits / savings?

Based on representative of real conditions inputs/corrosion rates provided by suitable labo-

Petroleum, Inhibitors, Metallurgy, Engineering Industries



ratory experiments, the base model is trained and customized by considering processed crudes specificities and other given parameters. Once built, it becomes practicable for a tailored model to predict/anticipate effects linked to new inputs (new crudes, new velocities, new processing parameters, etc...).

- **Make profits** while processing more 'opportunity crudes' in safely managed conditions.
- **Simulate global behavior** for existing assets fitting for service.



Deliverables:

- **NAC computational prediction model**



Stakes:

- **Manage** acid crudes processing with a decision-making aid tool.
- **Anticipate** NAC rates shift induced by operating parameters change. Inputs for RBI
- **Optimize** material selection, crude blending and inhibitor evaluation.
- **Cost-cutting**

⇒ **NeuroNAC®-JIP Preface and Poster coming soon**



Description of ANN model:

The correlation between all the physical variables is codified in the internal structure, represented by bi-dimensional matrixes and predefined algorithms. The independent variables are projected through the ANN providing the output.

Development and training of an ANN model:

- The matrixes are calculated during a learning procedure.
- Couples of dependent and independent variables (causes and effect of the phenomena) are used to adjust the ANN matrixes value.
- When the values no longer significantly change the ANN model is carried out.

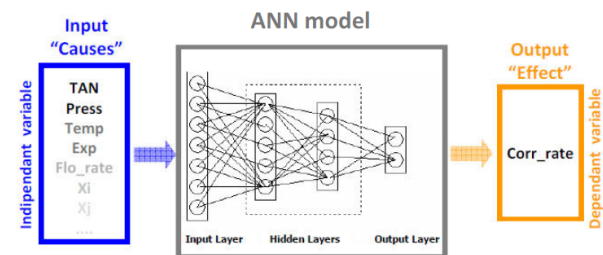
ANN model characterization:

- No assumption about of the physical laws and mathematical relationship are required.
- The i/o functional relationship between causes and effect are extracted from sample of the phenomena.

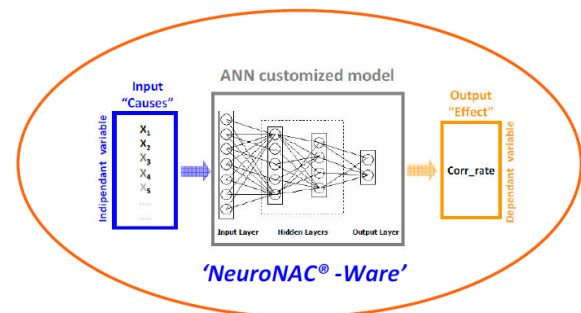
Customization:

- A set of process observation covering a wide range of variability of the dependant and independent variables shall be available.

NeuroNAC®-JIP



ANN Customization



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We are experienced in worldwide assistance for a highly demanding segment of activity while offering expertise and superior ability for Oil & Gas and Energy industries.

WINTech Global to assist performers involved in the ways to care about valuable assets all along their life.

Our Fundamental Axis



- Security of Persons & Means
- Capability of the Equipments
- Risk assessment and management
- Reduce risk of non-scheduled shut-down
- Optimize life cycle of the equipments and accessories