TARO

Plant-wide optimisation for the downstream industry

Taro is a powerful RAM simulation tool that has been specifically developed for the modelling of refining and petrochemical plants. The production efficiency in these plants is a complex interaction between reliability, blending and yield rules, flow routing and intermediate storage options.

- **Return on investment**
  Taro allows users to investigate different design alternatives that include financial aspects and cost/benefit analysis.

- **Optimising**
  Identification of system constraints and quantification of drivers for system downtime allow users to optimise the design.

- **Extensive**
  The simulator allows users to capture a wide range of conditions and configurations, such as flaring and time varying flow rates, to accurately model real life systems.

- **Flexible**
  The simulator allows users to set up very complex configurations using powerful Boolean logic.

- **Usable**
  The Taro interface and reports are designed to be intuitive and useful to industry professionals focusing on representing reality in the most recognisable way possible.

- **Long experience**
  Taro has been developed for more than 20 years to solve problems faced by our consultants working with major companies worldwide. Continuous efforts into addressing industry specific problems have made Taro uniquely well suited for the downstream oil and gas industry.

- **Extendable**
  Taro can be run through scripts and the results can be exported to different output formats, allowing users to create highly customised input structures and to post-process and present the results in any imaginable way.

Predicting the performance

Plant-wide performance analysis can help users make the right design decisions by quantifying the performance of systems, leading to the optimisation of through-put and utilisation.

Improving process unit reliability and optimising asset management are ways to increase unit and plant utilisation. For large, complex and flexible plants especially it is not a trivial task. Add to the equation the desire to decrease tank sizes and inventories and the challenge becomes even greater. Taro can be used to provide decision support for a large range of production related optimisation tasks and has been extensively used by DNV GL consultants for more than 20 years.

The simulation package can capture all the inter-related parameters that have an impact on system performance.

Taro predicts the performance of a system using simulation techniques. An "Event-Driven" algorithm is used to create life-cycle scenarios of the system under investigation accounting for its reliability, maintainability and operating policies.

The simulator is inherently incorporated with a specially designed algorithm to analyse the impact of each individual scenario on how the system performs. By studying performance results and how they respond to altering specific parameters in the design or its logistics, it is possible to optimise the system with respect to given constraints.

By considering key parameters e.g. unit reliability, unit capacity /max (re-run) capacity and buffer storage, accurate estimations of production efficiency can be determined. The simulation package can capture all the inter-related parameters that have an impact on plant performance.

Key features of Taro:

- Discrete event driven simulation - a very powerful platform
- Extensive flow modelling capability including recycling, divergent and convergent flow
- Highly intuitive graphical user-Interface - asset view, reliability block diagram view, grid views and symbol view
- Equipment catalogue - build your own custom equipment catalogue for future studies
- Multiple feed stock supply with discrete and/or statistical distributions to model feed variation
- Intermediate product streams and routing issues
- Demand profiles to control flow during operational conditions
- Unit overcapacities - maximum capacity v. normal throughput
- Unit turndown capabilities - minimum flow/slowdowns
- Storage tanks defined as feed, intermediate and export assets
- Storage tank operating rules such as called-up, suppress bulk transport and event-triggering
- Bulk transport modelling with modelling constraints related to berthing, storage tanks and ship availability
- Ships defined by size, frequency, probability of delay, travel time
- Planned events with Gantt chart view to easily assess overlaps
- Unplanned events with more than ten different failure and repair distributions
- Conditional logic - powerful Boolean logic enables most operational scenarios to be modelled
- Operating logic - operational flexibility to deal with refinery
- Operations & Maintenance modelling with resources constraints
- Spares optimisation analysis
- Life-cycle cost analysis with revenue profile calculation based on probabilistic estimate of production, discount factor, capital expenditure and operational expenditure
- Criticality level indicating production loss related to equipment, system and unit reliability
- Interactive graphical and tabular output with drill-down facility
- Extendable and easy to manipulate set of results
- Results viewer application exported and used without the need of license
- Production statistics
- Plant/unit statistics and utilisation
- Multi-customer contract shortfalls analysis (size and frequency)
- Plant shutdown analysis (size and frequency)
- Powerful dynamic animation
- Multi core processing for fast calculation performance
- Batch run - to run multiple studies using each core of the multicore processor, suitable for Sensitivity Analysis
- Automation scripting (Excel Macro support)