

## CLAIMS

1. A cleansing system [10] for improving operation of a plant [12a-12n], the cleansing system [10] comprising:

a server [14] coupled to the cleansing system [10] for communicating with the plant [12a-12n] via a communication network [16];

a computer system [18] having a web-based platform for receiving and sending plant data related to the operation of the plant [12a-12n] over the network [16];

a display device [20] for interactively displaying the plant data; and

a data cleansing unit [28] configured for:

i. receiving a process model data of a simulation engine, plant process data associated with the equipment of the plant [12a-12n], and plant laboratory data associated with the equipment of the plant [12a-12n],

ii. analysing the received plant process data for completeness and to correct an error in the received plant process data from a measurement issue and an overall mass balance closure to generate a set of reconciled plant data,

iii. calculating an offset amount representing a difference data between process model data, the plant laboratory data, and the reconciled plant data and thereby evaluating the calculated offset amount based on at least one environment factor for detecting an error of equipment during the operation of the plant ,

wherein the at least one environmental factor includes at least one primary factor, and an optional secondary factor.

2. The cleansing system of claim 1, wherein the at least one primary factor includes at least one of: a temperature, a pressure, a feed flow, and a product flow.

3. The cleansing system of claim 1, wherein the optional secondary factor includes at least one of: a density value and a specific composition.

4. The cleansing system of any of claims 1-3,  
wherein the data cleansing unit [28] is configured such that the corrected data is used as an input to a simulation process, in which the process model is tuned to ensure that the simulation process matches the reconciled plant data, and

wherein the data cleansing unit [28] is configured such that an output of the reconciled plant data is inputted into a tuned flowsheet, and is generated as a predicted data.

5. The cleansing system of claim 4, wherein the data cleansing unit [28] is configured such that a delta value representing a difference between the reconciled plant data and the predicted data is validated to ensure that a viable optimization case is established for a simulation process run.

6. The cleansing system of claim 5, wherein a tuned simulation engine is used as a basis for the viable optimization case being run with the reconciled plant data as an input, and an output from the turned simulation engine is an optimized data.

7. The cleansing system of claim 6, wherein a difference between the reconciled data and the optimized data indicates one or more plant variables which are capable of being changed to reach a greater performance for the plant [12a-12n].

8. The cleansing system of any of claims 1- 3, further comprising a reconciliation unit [22] configured for reconciling actual measured data from the plant [12a-12n] in comparison with a performance process model result from a simulation engine based on a set of predetermined reference or set points,

wherein the reconciliation unit [22] is configured to perform a heuristic analysis against the actual measured data and the performance process model result using a set of predetermined threshold values, and

wherein the reconciliation unit [22] is configured to receive the plant data from the plant [12a-12n] via the computer system [18], and the received plant data represents the actual measured data from the equipment in the plant [12a-12n] during a predetermined time period.

9. The cleansing system of any of claims 1-3, further comprising a diagnosis unit [30] configured for diagnosing an operational status of the

measurement by calculating the offset amount based on the at least one environmental factor,

wherein the diagnosis unit [30] is configured to receive the feed and product information from the plant [12a-12n] to evaluate the equipment, and to determine a target tolerance level of a final product based on at least one of: an actual current operational parameter and a historical operational parameter for detecting the error of the equipment based on the target tolerance level.