CLAIMS

I/ We claim,

1) A method for an engine maintenance scheduling based on an optimization of the resource capacity, the method comprising:
selling maintenance slot by a sales department to the asset owners or airlines;
receiving the maintenance information from the sales department;
making a contract with confident NTEP elements for maximizing conversion and profitability per slot, with the asset owners or airlines based on the required repair information;
estimating a routine and a non-routine maintenance based on a stochastic model and a machine-learning model;
forecasting total resource demands for the visit based on the estimated routine and non-routine maintenance;
scheduling a slot by a Master Scheduler and a Slave Scheduler;
determining the standard/ baseline schedule for and finalizing the visit;
updating the standard/ baseline schedule of a visit and recalculating the associated risk based on a real-time update of an engine;
training and retraining the machine learning model based on the operational parameters and maintenance/ capacity requirements of an engine as an input using a Bayesian update mechanism.

2) The method of claim 1, wherein the scheduling of the slot by the Master Scheduler and the Slave Scheduler comprising:
transferring the forecasted resource demand information to the Master Scheduler;
utilizing the existing schedule of visits by the Master Scheduler;
sending the instructions to the Slave Scheduler by the Master Scheduler to modify the visit in order to assign a resource with less risk;
scheduling and rescheduling the visits based on the real-time capacity update by the Master Scheduler;

Optimizing and deciding on the potential risks of freeing up the resource and utilizing for other phases of visits by the Master Scheduler when not getting response from customers;

scheduling a plurality of phases of the visit by the Slave Scheduler;

determining a set of tasks and sub-tasks for the plurality of phases of the visit;

allocating a resource to the respective task and sub-task;

creating a tentative schedule for the maintenance by optimizing the analytical parameters and minimizing resource usage and TAT risks associated with the visit;

deciding whether to proceed with the visit or to simulate other plan for the visit.

3) The method of claim 1, wherein the demands are made for the resources including but not limited to manpower, material and equipment required for the maintenance of an engine.

4) The method of claim 1, wherein the operational parameters for training and retraining the machine learning model include but not limited to - Time Since New (TSN), Cycles Since New (CSN), Time Since Repair (TSR), and Cycles Since Repair (CSR), Exhaust Gas Temperature Margin (EGTM), Specific Fuel Consumption (SFC), Average Thrust Derate and Operating Environment (Hot / Dry, Temperate, Corrosive).

5) A scheduler based on an optimization of a resource capacity for the maintenance of an engine, the scheduler comprising:

a processor coupled to the memory; and

at least one application stored in the memory and executable by the processor for:

selling maintenance slot by a sales department to the asset owners or airlines;

receiving the maintenance information from the sales department;

making a contract with confident NTEP elements for maximizing conversion and profitability per slot, with the asset owners or airlines based on the required repair information;

estimating a routine and a non-routine maintenance based on a stochastic model and a machine-learning model;

forecasting total resource demands for the visit based on the estimated routine and non-routine maintenance;

scheduling a slot by a Master Scheduler and a Slave Scheduler;

determining the standard/ baseline schedule for and finalizing the visit;

updating the standard/ baseline schedule of a visit and recalculating the associated risk based on a real-time update of an engine;

training and retraining the machine learning model based on the operational parameters and maintenance/ capacity requirements of an engine as an input using a Bayesian update mechanism.

6) The scheduler of claim 5, wherein the scheduling of the slot by the Master Scheduler and the Slave Scheduler comprising:

transferring the forecasted resource demand information to the Master Scheduler;

utilizing the existing schedule of visits by the Master Scheduler;

sending the instructions to the Slave Scheduler by the Master Scheduler to modify the visit in order to assign a resource with less risk;

scheduling and rescheduling the visits based on the real-time capacity update by the Master Scheduler;

optimizing and deciding on the potential risks of freeing up the resource and utilizing for other phases of visits by the Master Scheduler when not getting response from customers;

scheduling a plurality of phases of the visit by the Slave Scheduler;

determining a set of tasks and sub-tasks for the plurality of phases of the visit;

allocating a resource to the respective task and sub-task;

creating a tentative schedule for the maintenance by optimizing the analytical parameters and minimizing resource usage and TAT risks associated with the visit;

deciding whether to proceed with the visit or to simulate other plan for the visit.

7) The scheduler of claim 5, wherein the demands are made for the resources including but not limited to manpower, material and equipment required for the maintenance of an engine.

8) The scheduler of claim 5, wherein the operational parameters for training and retraining the machine learning model include but not limited to - Time Since New (TSN), Cycles Since New (CSN), Time Since Repair (TSR), and Cycles Since Repair (CSR), Exhaust Gas

Temperature Margin (EGTM), Specific Fuel Consumption (SFC), Average Thrust Derate and Operating Environment (Hot / Dry, Temperate, Corrosive).