FRS (OPM) . Gen Deptt

Srno	Functional Requirement	
1	System should be able to maintain a database (updated at user defined intervals) of technical design of power plants (with details such as diagrams of boilers, turbines, generators, accessories, layouts etc.)	
2	System should be able to maintain a database (updated at user defined intervals) of age, make, model, capacity, date of commercial operations (CoD), part numbers, of each of the units/plant and their sub-components such as	
	• Coal Handling System	
	• Boiler System	
	• Turbine System	
	• Demineralization System	
	• Electrical System	
	• Generation Control System	
	• Ash Handling System	
	• Civil Department	
	• Hydel power plants	
	• Effluent treatment plant	
3	System should have standard manuals for operation and maintenance of equipments	
4	System should be able to maintain a database (updated at user defined intervals) of equipment history with details of maintenance records, replacements of parts etc.	
5	System should have the provision of alert for scheduled maintenance of components as prescribed by the manufacturer/authorized personnel	
6	System should have the capability to generate reports giving a comparison on the performance of similar equipments across the units plants on parameters defined by the user	
7	System should be able to provide an interface with all kinds of instruments (*necessary transducers,RTUs, splitters, data acquisition system, and other necessary hardware & software)* used for capturing required operational data at plant, including but not limited to the following, at user defined intervals for each unit / stage / plant.	
A	Turbine parameters	
a	Steam temperature at inlet of HP turbine	
b	Steam pressure at inlet of HP turbine	
c	HP turbine exhaust steam temperature	
d	HP turbine exhaust steam pressure	
e	HRH steam temperature	
f	HRH steam pressure	
g	IP turbine exhaust steam temperature	
h	IP turbine exhaust steam pressure	
i	LP turbine exhaust steam temperature at both side	
B	Condesor parameters	
a	CW flow through both sides of condensor	
b	CW inlet temperature at both sides	
c	CW outlet temperature at both sides	
d	Condensor vaccum pressure	
e	Condensor DP at both sides	
C	Feed Water Heater	
a	All extraction steam temperature & pressure at shell end	
b	All heaters drain temperature	
c	All heaters feed water inlet & outlet temperature	

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Srno	Functional Requirement	
d	Condensate extraction flow to deaerator	
e	Feed water flow through HP heaters	
f	Feed water at the inlet of HP heater	
D	Air Heater	
a	Ambient Air temperature	
b	Primary air temperature (L&R) at inlet and out let of APH	
c	Primary air Pressure (L&R) at inlet and out let of APH	
d	Secondary air temperature (L&R) at inlet and out let of APH	
e	Secondary air Pressure (L&R) at inlet and out let of APH	
f	Flue gas temperature (L&R) at inlet and out let of APH	
g	Flue gas Pressure (L&R) at inlet and out let of APH	
h	Flue gas temperature at inlet of secondary air heater	
i	Flue gas temperature at outlet of secondary air heater	
j	O2% at inlet & outlet of Air pre heater	
k	Primary Air flow through air heater	
l	Secondary Air flow through air heater	
m		
n		
o		
E	Boiler & Economizer Parameters	
a	Feed Flow	
b	Feed water inlet temperature	
c	Feed water inlet pressure	
d	Feed water temperature at outlet of economizer	
e	Superheater spray water temperature	
f	Superheater spray water pressure	
g	Superheater spray water flow	
h	Reheater spray water flow	
i	Reheater spray water temperature	
j	Reheater spray water pressure	
k	Main steam temperature	
l	Main steam Pressure	
m	Main steam flow	
n	Auxiliary steam temperature	
o	Auxiliary steam flow	
p	Auxiliary steam pressure	
q	Flue gas temperature at inlet of economizer	
r	Flue gas temperature at outlet of economizer	
s	Flue gas temperature at inlet and outlet of ESP	
t	Dust Concentration at ESP outlet (SPM)	
F	Coal Mill & Furnace	
a	primary air temperature at inlet of coal mill	
b	Coal Mill Temperature	
c	Operating hours of grinding media of coal mill	
d	Furnace Temperature	
e	Excess Air %	
G	ID & FD Fans	
a	Speed of FD Fan	
b	Pressure of FD Fan	
c	Power Consumed by FD Fan	
d	Speed of ID Fan	
e	Pressure of ID Fan	

Srno	Functional Requirement	
f	Power Consumed by ID Fan	
H	Ash Handling System	
	Quantum of Ash being handled by Electrostatic Precipitator	
I	Emission Monitoring	
a	Flue gas temperature at inlet of chimney	
b	Flue gas temperature at outlet of chimney	
c	SOX,NOX and PM at chimney	
J	Generator Parameters	
a	R/Y/B Phase current	
b	RYB Phase voltage	
c	MW	
d	MVAR	
e	MVA	
f	PF	
g	Frequency	
h	Field voltage & current	
i	Excitation Voltage	
j	Excitation current	
k	Rotor Temperatures	
l	Maximum Slot Temperatures	
m	Hydrogen Pressure	
n	Purity of Hydrogen	
o	Seal Oil Pressure	
p	Due pint temp	
K	Demineralization Plant	
a	Chemical properties of DM water such as Ph value, O2 level, silica, conductivity levels	
b	Daily consumption of DM water	
L	Electric Control Room	
a	Bus Voltage	
b	Feeder wise current / Voltage / MW / MVA / PF/ MWh	
M	Hydel Power stations	
a	Active power	
b	Reactive power	
c	Auxiliary consumption	
d	Lake level	
e	Line Load current / voltage / MW	
	Bidders to note that the parameters mentioned at 7 above are indicative only and there are many more parameters which are to be captured. If desired, Bidders can send a request in writing to purchaser for getting the log books and report templates containing various parameters and get them physically collected through their authorized representative from purchaser's office.	
8	***The system should be capable of providing online simulating mechanism to achieve the optimum performance of unit.***	
	Costing and Budgeting	
9	System should be able to maintain a database (updated at user defined intervals) required for the computation of operating cost for each of the units of the operations department	

Srno	Functional Requirement	
10	System should calculate the daily average per unit cost of generation unit wise / plant wise / company wise.	
11	System should support the preparation of budgets for preventive and annual maintenance for each unit of the department	
12	System should be able to support preparation of tender documents in standard formats	
13	System should be able to keep track of the amount allocated to each unit of the department against the work in progress	
	Renovation & Modernisation	
14	System should be able to keep operational history of the generation, outages, accident details, heat rate for each unit / plant, auxiliary consumption, specific coal consumption (with reference to CV of coal consumed), specific oil consumption.	
15	System should have repository for storing RLA (residual Life Assessment), overhauling preparedness Index (OPI) ,Bar Chart for AOH, annual overhaul report with key recommendations, before and after AOH KPI report .	
16	System should be able to do cost benefit analysis of proposed schemes as defined by user through different techniques like NPV , IRR, discounted payback, etc	
17	System should be able to do cost benefit analysis of implemented R&M schemes as defined by user through different techniques like NPV , IRR, discounted payback, etc	
18	System should be able to keep track of loan application to funding agencies such as PFC and provide other details	
19	System should be able to compute interest payments and design repayment schedule for loan taken	
20	System should have project monitoring tools with ability to track physical and financial progress of works.	
21	The system should compute the deviation in the performance parameters with respect to design value.- Specific software for mapping may be included for this purpose.	
22	The system should have records of major replacement carried out during AOH/COH of units for last 5 years.	
23	The system should incorporate the lead time required to obtain various approvals e.g. administrative approval from BoD, approval of capital expenditure by MPERC, preparation of technical specifications, financial closure, tendering and execution of R&M works (matching with the proposed overhaul schedule)	
24	The system should be able to compare the performance post R&M with that occurring before R&M for the equipments/units.	
25	The system should be able to store the information regarding R& M works carried out on similar sized/similar aged units with associated benefits gained.	

21/6/2018