Annual Maintenance Plan and Budget

From: michael]
Sent: Monday, 16 February 2009 3:41 AM
To: info@lifetime-reliability.com
Subject: MAINTENANCE PLAN

PLEASE I NEED HELP ON HOW TO DEVELOP A ONE YEAR MAINTENANCE PLAN FOR MY ESTABLISHMENT, INCLUDING BUDGETING.

OUR EQUIPMENTS ARE: THREE GENERATING SET OF 250 KVA PERKINGS, 30KVA CUMMINGS, AND 18KVA SKARR POWER GENERATOR.
THIRTY AIR CONDITIONING SET, 200 VALVES, 50 CENTRIFUGAL PUMPS, TWO UPS, 200 COMPUTERS, LIGHTING SYSTEMS, FIRE FIGHTING MACHINES, TWO BUSTER PUMPS, CARS, PIPE LINES.

THANK YOU FOR YOUR ANTICIPATED CO-OPERATION.

MICHAEL

Dear Michael,

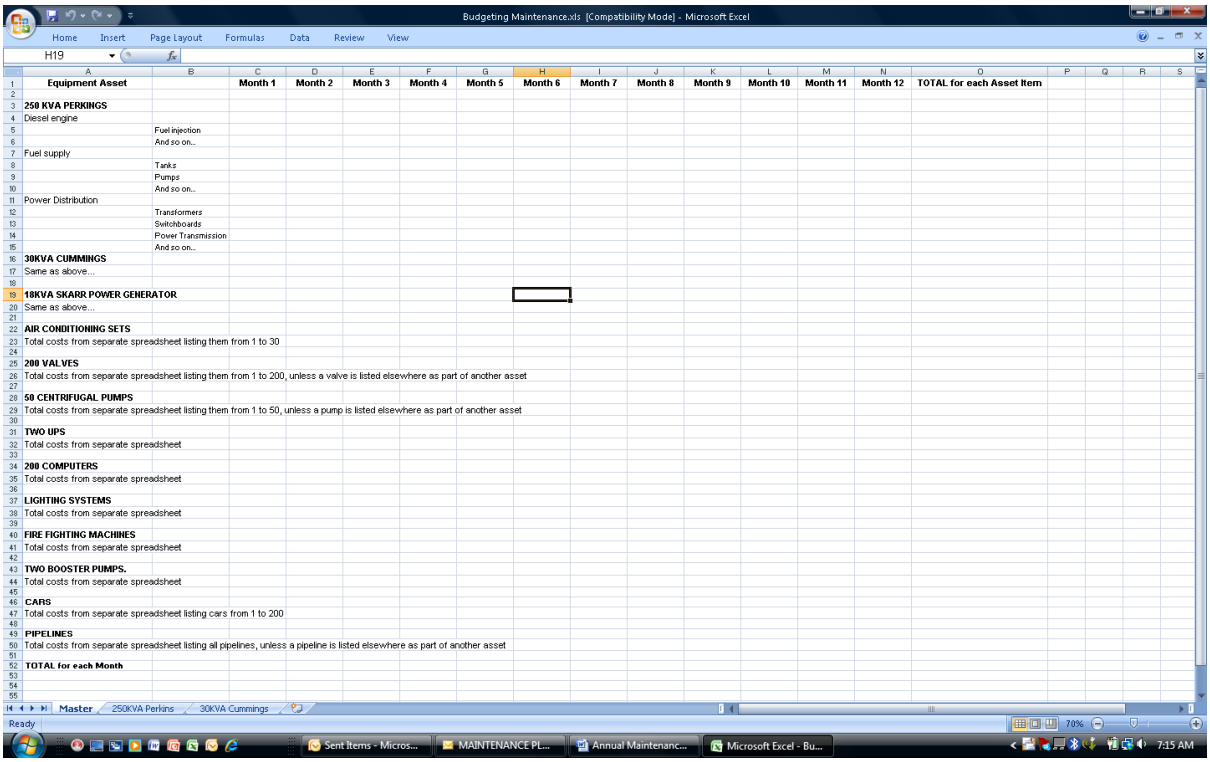
In putting a maintenance plan together for next year you are trying to judge what work the maintenance department will do each month over the year. What will it spend its money on each month, including management, supervision, engineers, facilities, crew, contractors, spare parts, all subcontracted jobs and work sent off-site to be done in someone else's workshop, etc?

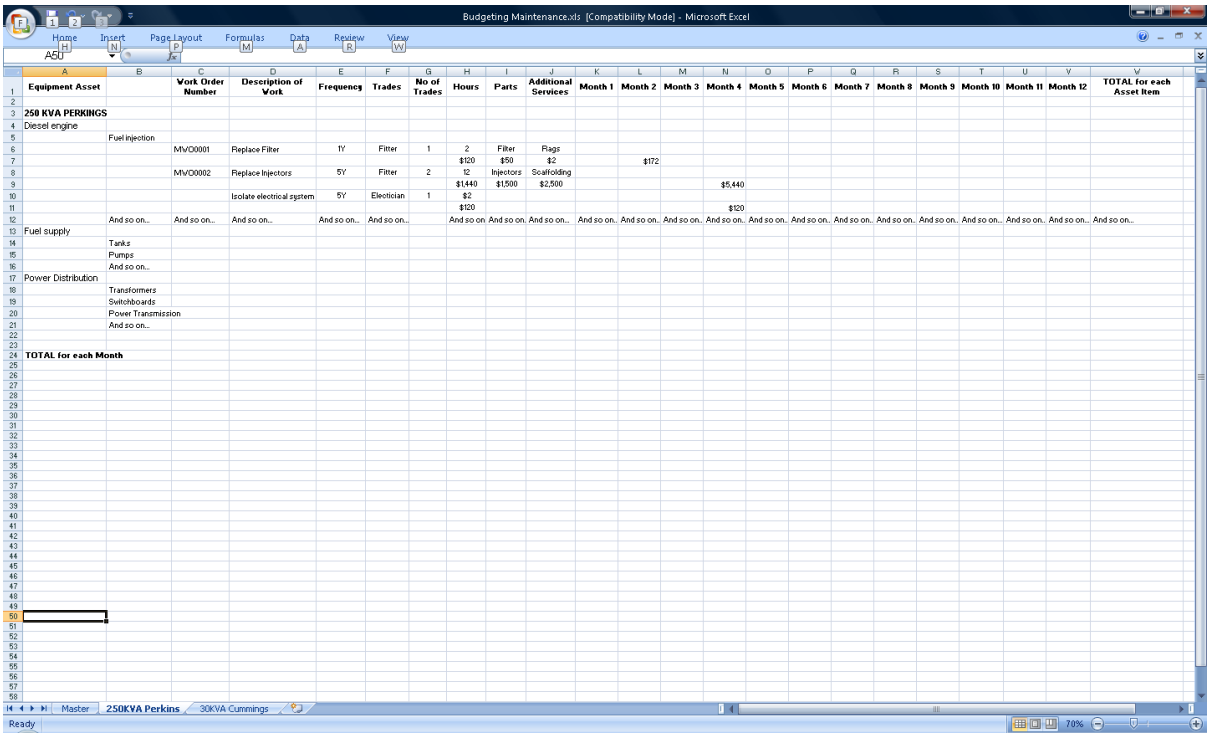
A zero based budgeting approach, where you justify each job and its costs, is best and requires you to list every asset and every job to be done on each asset each month during the year. You include the total hours and cost for men by trade, materials, scaffolding, cranes, etc for each job. The moneys spent on the manager, engineers, supervision, planners, facilities (building power, office cleaning, water, toilet paper, etc) are listed separately. The other sort of budgeting is to leave costs the same as average historical costs for the last 2 – 3 years, or just last year's costs, and add some money for inflation, plus any special work that you know is coming up in the year.

Usually there is master spreadsheet showing the assets listed individually down the page. If there are major assemblies in an asset you also list them under the asset they belong with. For example, the generating sets will have diesel engine, fuel supply system, power distribution system, transformers, and other substantial equipment needed to deliver their service, and these are listed separately for each diesel generating sets. You could even subdivide the major assemblies into subassemblies if you want to go that far. Across the top of the spreadsheet are the months in the year. Within the table are the total costs to maintain each asset item per month.

The sample layouts of a maintenance budgeting spreadsheet that follow will give you an idea of what it needs to contain. You will need to use your best judgement and discussions with

other maintenance planners, engineers and your managers to develop the one for your operation. Check if someone in your company has already done a budget spreadsheet before, as you might be able to get a copy and see if it is useful for your current needs.





In a separate spreadsheet for each major asset and its equipment items you list the work orders to be done each month. Also listed is a brief description of each work order, the trades involved, the hours they use up and various services and supplementary items they need for the job. For each of these you have a cost and you total the cost for each work order. Then

you total all the work orders for the month and this figure is the one you show on the master spreadsheet. If there are special work coming up in the month, like a 5-yearly statutory inspection, or a 2-yearly transformer oil sampling, you list it in the spreadsheet against the asset concerned.

The jobs on the spreadsheets are the planned work – the preventive, predictive and statutory maintenance done to keep equipment in good condition. What you don't know are the breakdowns and emergencies that will happen during the year. The amount and size of breakdowns is a reflection of the management's maintenance policy and the operation's reliability culture. The best indicators of emergency costs for the coming year are those from history. Unless reliability improvements were made to reduce their operating risks they will repeat because their chance of failure have remained the same. No one wants breakdowns and emergencies and the job of operations and maintenance is to work together to prevent them through precision operation and precision maintenance to produce huge risk reduction.

If you need to reduce your maintenance budget you need to do a risk analysis to see which work orders can be dropped with negligible risk to the operation. This means looking at a work order in detail to see if the work is really useful in keeping the item operational, or could it be dropped. It is common that maintenance work done on equipment does not need to be done so often, or could be done in simpler ways, like 'look, touch, listen' inspections and report any problems, while still providing adequate risk coverage. To do a risk analysis you need a risk matrix calibrated to your site's level of risk. It is a team approach where people knowledgeable about the operation and its equipment review each work order to decide if the risk is so low anyway that it does not need to be done. If it does need to be done, can it be by less qualified, but competent people (say by trained operators or trades assistants); can it be done simpler (say with a thermography camera instead of opening up to look inside), and could it be done less often (say 12-monthly instead of 6-monthly because there is no appreciable change in risk)? Let the risk matrix make the decision for you, and do not use peoples' 'gut feel'.

For example, if you had regular maintenance jobs to change fuel filters, and you were looking to reduce the amount of maintenance work, you could instead have a work order that said to inspect the pressure gauges on the inlet and outlet side of the filter and only change the filter if the pressure loss was above a set value and before it got to a dangerous value. That means the work is only done when it is really necessary and not sooner. You save time by doing the maintenance job 'on condition', and you save money on filters not replaced before they needed to be. You could even go further and get the operators to inspect the filter as part of their rounds and only raise a work order when they see the differential pressure is past the lower limit, but before it gets too severe.

Best regards,

Mike Sondalini

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