

## Transparant PPS en DBMFO constructions

The market of putting to tender is moving more and more towards DBMFO-constructions. Herewith the constructor, specialist on the area of realization, has more responsibilities and freedom but also more obligations. Within preconditions the constructor can freely determine which preventive maintenance activities he will actually carry out, but he is obliged to pay a claim when his performance turns out to be inadequate. This is a new way of co-operation to the contractor as well as to the customer and both parties have to learn to deal with this new way of working together within a short notice of time.

### Risk distribution

This approach will lead to a substantial decrease of the customer's costs while safety, availability, reliability and quality are guaranteed at the same level or even higher. After all formerly the contractor was settled, based on the hours he had spent and therefore tended to spend more time on the project. In DBMFO contracts the issue is to make the best profit for the client, while the contractor receives a part of this profit, but also bears a part of the economic risk.

### Optimal policy

The problem at PPS-contracts – apart from the legal construction – is to determine in a transparent way what would be the optimal maintenance policy. On the area of qualitative maintenance analyses (such as error tree-analyses and reliability centered maintenance methods) many improvements already have been made. These analyses surely are useful, but normally they are not well-founded on the area of life cycle. Also they usually are based on averages and data from CMMS systems that, together with technical insights are used to perform these analyses. In this way young and old systems are reviewed on exactly the same standards and what recently has happened will be (too) quickly the standard for the entire asset population.



The maintenance data, after being extracted from the CMMS systems, stem from the earlier instead of the optimal policy. The insight in what would be the optimal policy also could be used with the RCM- and FMECA analyses. This is another limitation of just performing qualitative maintenance analyses.

### Life span

Maintenance is a big debit item for capital intensive assets. However, these costs are subordinate to the capital costs.

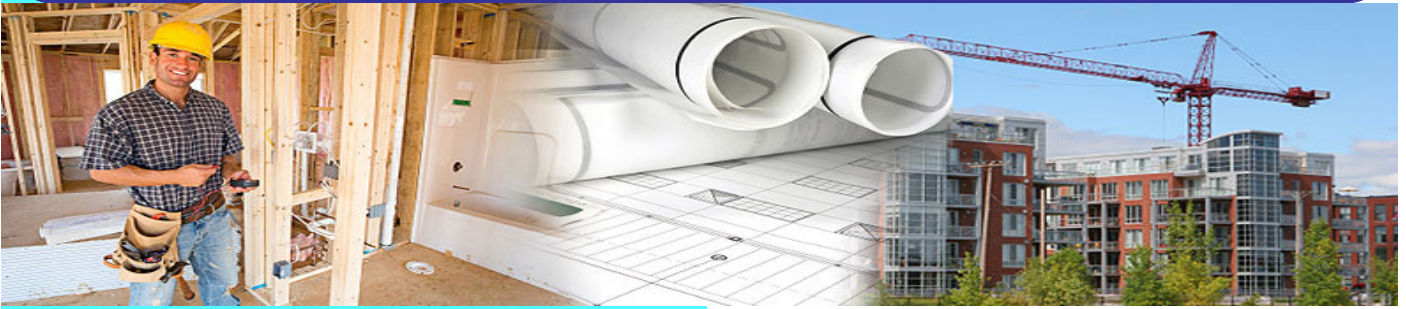
Besides operational reliability, safety, availability and quality, influencing the lifespan of assets is of great importance.

Analyses that can indicate failures and maintenance costs to increase over the lifespan are important to determine the economic replacement moment. By lengthening the lifespan with 10 years the average costs during the following lifespan cycle are only half as much (interest 7%)! To optimize the results of RCM- and FMECA-analyses they should be performed in this perspective.

### Quantitative maintenance analyses

*S&G and partners* has developed quantitative maintenance analyses to react optimal results. With these analyses the maintenance policy can be analyzed thoroughly and it will always be possible to choose the most profitable maintenance policy can be chosen. It is also possible to produce prognoses regarding the consequences for the future. A complete overview of the future results of the chosen policy can be produced, not only regarding the maintenance activities, but also to support replacement investment decisions.

# ASSET MANAGEMENT MET LIFE CYCLE COSTING



The system works as well on strategic as on tactical/ operational level, if necessary one-on-one per asset. S&G's biggest customer now has more than 20 million assets to calculate with. The software, developed by S&G at present is used in The Netherlands, Belgium, Germany, Hungary, the Czech Republic, Austria, Japan, Aruba and the USA.

## The most important analyses are:

- Cost-benefit analyses: the possibilities for LCC-calculations are the most advanced that can be found on the market;
- Quantitative maintenance analyses:
  - The analysis of the maintenance in the past period. With these among other things the most important costs, the amounts of activity, the falling out and the maintenance duration in the past period can be determined. The output is shown e.g. in chart trees. The calculations can be divided in assets as well as events. With the help of several functions for reproduction the 'top ten' on the area of costs, amounts and duration can be shown. In the analyses you can zoom in as deep as you have defined the analyses;
  - The analysis on lifespan: With registered data of only several years the costs over the lifespan can be calculated. With this function you can learn whether the failures, maintenance costs and maintenance duration increase as the assets grow older. Also can be determined when certain kinds of failures occur. These insights are of great importance for the determination of the economic replacement moment. Here also the data are shown in 'leveled' chart trees (for instance per type of asset and within amongst others classified after cause and consequence). The cost price can be calculated on each detail level.

- The analysis effect of the maintenance: this analysis shows how effective different kinds of preventive maintenance really are or on the contrary indicate maintenance induced failures. In many occasions preventive maintenance turns out ineffective, for example when it is done too early. It can also lead to more failures, instead of less. With this analysis after all you can also obtain insight in the frequency of the maintenance activities.
- The prognosis function. Based on the charts produced with the lifespan analyses a prognosis of the future can be made. This prognosis function is unique in the world, according to the information S&G can dispose of. With the help of this function per different management scenario an outline of the financial, economic and technical future can be shown.
- Long term cost calculations: with these analyses, based on the chosen policy the costs and revenues are estimated over a long-term period of time.

The insights obtained in the analyses described above can effectively lead to transparent PPS and DBMFO contracts. *S&G and partners* would be pleased to be of your assistance!



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