



SMART – maintenance systems for infrastructure facilities

Based on an increasing demand and new areas of application, Rambøll’s web-based maintenance system for infrastructure facilities has collectively been named SMART. The systems are marketed under discipline related last names such as SMART Ports, SMART Bridges, SMART Roads, SMART Sewage, SMART Water, etc.

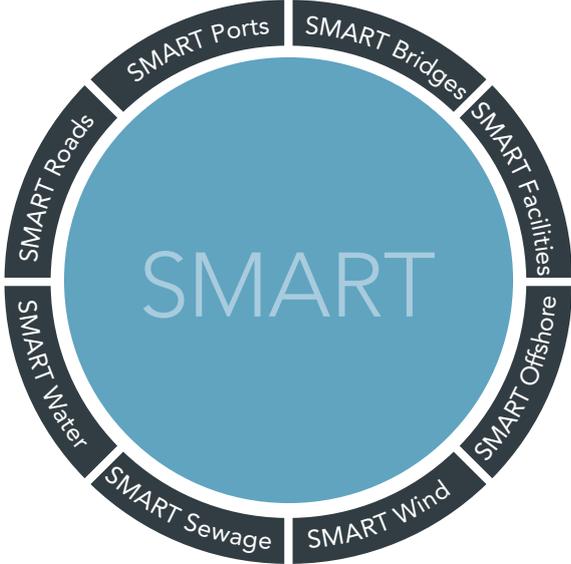
The programs used up till now POMS (ports), ROMS (roads) and DANBROweb (bridges) have been developed from a common platform with only slight differences. The programs have shown themselves to be generally applicable and are already in use for sewage structures, water supply facilities and canal supply systems.

The common name SMART is also applicable in English and inspired by the English expression Smart Structures.

The wide application of the SMART program is due to the fact that SMART is based on a

solid foundation of systematic maintenance principles - principles, which are well suited for the management of operation and maintenance of infrastructure facilities on a broad front.

Further to the previously mentioned applications, the program is used by counties in the management of their many facilities and outsourcing of maintenance tasks. The program has been sold for maintenance management of road systems, buildings, quays etc. on a major power plant, and is also expected to be applicable for offshore wind structures.



We believe it will be most advantageous for the users, that SMART now can be offered to more user groups, as all users will profit from the further development within the specific areas, and other management groups may even be a source of inspiration.

Simultaneously with merging the programs, it has been decided that a joint SMART Newsletter will be published

– probably 1-2 times per year
– to all Rambøll’s SMART clients.

Is it only the sewers that are in a bad condition?

At the municipality of Gentofte it is not only the condition of the pipes in the sewage system, but also the condition of structures, reservoirs, canals and pumping stations which is being registered. This registration is often omitted in the discussion of the pressing need for renovation of the sewage systems in Denmark.

Today a large number of municipalities have detailed databases of their pipe systems and have additionally – through TV inspections – obtained a detailed knowledge of the condition of the pipes and hence the need for renovation.

However, what in many places is lacking is the corresponding detailed knowledge of the parts of the sewage system, which cannot be checked by a TV inspection, such as large sewage pipes, closed canals, overflow structures, reservoirs and pumping stations. It has often been the case that large expenses are 'hidden' for renovation of these sections of the sewage system. At the same time these are often vital parts of the system, which must be in good condition, as the consequences in case of damage may be extensive.

In order to form an overview of the conditions of the structures etc., Rambøll can offer the program SMART Sewage. The program monitors the conditions of the facilities, the need for renovation, future investments, as well as a time schedule for required renovation works.

The program is presently being implemented in the waste water section at the municipality of Gentofte, and Section Leader Arne Kristensen states: "We have for some time been looking for a tool to give us an overview of the renovation and investment needs for the facilities, which are not sewer pipes and wells. We believe SMART Sewage is the best solution on the market and we look forward to working with the program".



SMART Water

The assignments within the water supply sector are becoming ever more complicated and the considerations to a stable and safe water quality means it is very important to comply with the many routines for monitoring and maintenance, including cleaning and replacement of parts. At the same time, it is also important to secure the considerable know-how in staff members of long standing. A replacement in personnel may result in the risk of tasks being forgotten, which in turn may reduce the security in water supply.

SMART Water is presently being implemented as the operation and maintenance system at Viborg Vand A/S. Ulrik Vestergaard, Viborg Vand A/S, says: "It seems to have the quality of becoming a very useful tool for optimising our

operation and maintenance. I also expect qualified documentation for our long-term requirements regarding maintenance and replacements, giving our employees a good basis for planning and solving their work assignments. I look forward to easy access to documentation of our plants for all relevant employees and external partners. It would be a huge relief in our day-to-day work".

Director Palle Holm expects that SMART Water will improve the basis for the more general decisions in the company. "We hope that SMART Water gives us adequate possibilities for reordering priorities during the course of a year, if unexpected disbursements occur".



SMART as a tool in connection with partnering in the county of Ribe

In 2004 the county of Ribe entered into three new partnering agreements within roads – two agreements with asphalt contractors and an agreement with a traffic marking contractor. The purpose of the agreements is to continue the county's large commitment to developing and testing new solutions and forms of collaboration.

In order to fulfil the partnering principle of openness and a

high level of information, the county of Ribe has chosen to use SMART as the "dialogue" tool in the three agreements, so that all document control and tasks are carried out in SMART".

The decision to use SMART was taken by the county of Ribe in conjunction with the three contractors based on careful evaluations of the expected requirements for control and documentation.

In this connection it was estimated that the need for access to data and visibility in the progress of the agreements was so important that a digital solution is necessary, and SMART is expected to be able to fulfil these requirements.

The county of Ribe has great expectations to the practical application of SMART in the three partnering agreements, and the county is gradually

planning to apply SMART in other operation tasks (summer and winter), as well as in 14 contracts regarding asphaltting and traffic marking.

News in SMART version 2.2

As compared to version 2.1, released about a year ago, the below-mentioned news comprises major news primarily regarding improvements of the facilities in task control. SMART will to an even greater extent be prepared for the web-based application, in which the partners are given the possibility of reporting directly to the system. This is expected to be very widespread during the coming years.

Possibility for rejecting performance of a job

The normally assumed course is the request for a job, selection, execution, completion and filing. If the person completing a job (eg a supervisor approving the work of a contractor) does not agree with the work having been carried out correctly, he may 'reject' it and possibly make some remarks about what is amiss. The job will hereafter be returned to the executor for renewed action.

Logging of change of status

When a job is requested and each time it changes status hereafter, it is automatically noted in a log with indication

of time, user name and new status. This means that you can follow the evolution of a job from 'birth' to the archive. This may be of importance in connection with repeated requests of completion/rejection/completion. Contrary to the time of execution registered upon completion, the logged times cannot subsequently be corrected by the user.

User control at company level

A more precise control of the jobs, which can be viewed by the individual user, has been introduced, depending on the company registered as the executing part on the individual job. E.g. you may specify that

a user at a contractor may be able to see only the jobs his own company is to carry out, or that a consulting engineer is able to see all the jobs carried out by all the contractors besides his own jobs, but not the jobs of other consultant engineers nor the client's jobs.

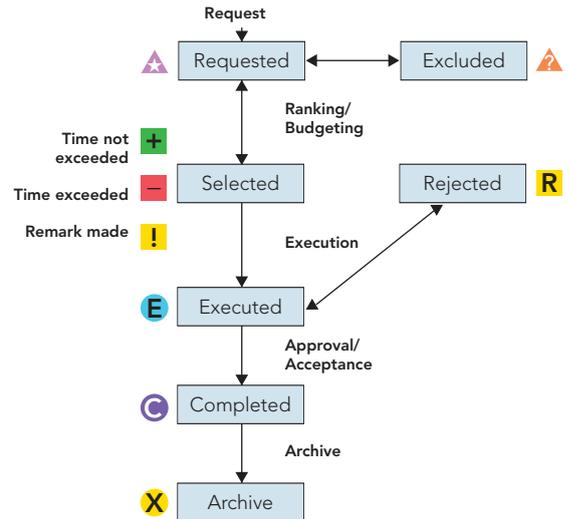
Improvement of bid schedule jobs

A hierarchical structured bid schedule has been included in the new version corresponding to practice in most lines of business. This ensures a better overview and makes it easier to navigate the bid schedule.

At the same time the possibility has been opened for indicating additional work in connection with the completion of a bid schedule job.

Registration of log in

In the future it is registered each time a user logs on to SMART. Only the date and time are registered – not who is logging in, or what they are doing. The registration, which is merely to give an indication of how much the system is being used, is shown in the user control module and can be seen only by the system manager.



Marketing of SMART in Italy

In connection with an evaluation for a concessionaire for an Italian Autostrada (highway), the Italian consultancy company Studio Archimede has indicated SMART as being

the best system for management of operation and maintenance. The result of the evaluation was presented at a conference in Japan in the autumn. Rambøll and Studio

Archimede has now entered into an agreement of co-operation regarding marketing of SMART in Italy.

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