

**The SRM Update.**  
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## **History / Background**

The Sewerage Rehabilitation Manual, or **SRM** as it is universally known, was first published in 1983 by WRc and since then has gained world-wide recognition as the standard reference work for industry professionals involved in upgrading the performance of existing of sewer systems.

The original SRM was the culmination of 10 years of research into sewer systems following national concern about the state of these assets, and was a ground-breaking document which integrated new technical developments in sewer inspection, sewer flow measurement, the simulation of sewer flows, and repair / renovation technology. Indeed, the very origins of WaPUG can be traced back to an informal meeting and discussion forum for the Wallingford Procedure developed by Hydraulics Research that is an integral part of the SRM approach.

Subsequent editions of the SRM have been published in 1986 (Second Edition), 1994 (Third Edition) and 2001 (Fourth Edition – current).

Key technical areas covered by the SRM include:

- how to determine the structural performance of sewers;
- survey techniques and procedures for assessing deterioration and collapse mechanisms;
- the investigation and analysis of hydraulic performance;
- the detailed consideration of environmental (receiving water quality) investigations;
- details of operations and maintenance investigations;
- least cost planning to maximise the use of existing assets;
- detailed guidance on all aspects of sewer renovation (design, selection and specification);
- defining critical sewers to focus pre-emptive management on sewers with the greatest consequences of failure.

## **The SRM Philosophy**

The technical advice of the SRM is encapsulated in a proven philosophy for sewer system management, which has the following tenets:

- the existing holes in the ground are the most valuable assets in any sewer system;
- any works on the sewer system should always think first about protecting / reusing / retaining the existing hole in the ground;

- it is vital to always consider all aspects of sewer system performance together (integration), whatever the initial reason for any detailed investigative study.

The service provided by sewer systems involves four interrelated aspects of performance, namely: structural, hydraulic (quantity), hydraulic (quality), and operational issues. These aspects of performance underlie the primary purpose of a sewer system which is to carry the flow. When upgrading the performance (ideally optimally) of an existing sewer system the interactions should always be considered, e.g. structural deterioration can lead to the ingress of deposits and infiltration, which will influence the flow quantity and quality. Ignoring interactions will nearly always adversely affect value for money and risk of failure, whereas conversely considering it in a logical framework will usually deliver better value for money and management of the total risk of failure.

The *integrated* approach embodied in the SRM has two key components. The first and original concept related to integrating the separate aspects of sewer system performance – structural, hydraulic, water quality. Over time it has been appreciated that it is also vital to integrate with all relevant externalities, particularly the wastewater treatment works and the total effect of the impact of the quantity and quality of discharges on the receiving watercourses.

### **The Need and Scope of the SRM Update.**

Since the publication of the First Edition of the SRM, the water industry in the UK has seen many organisational changes and further ones are planned, but throughout the period the SRM has remained a key technical reference document for sewer system upgrading.

At a WRc 2006 workshop, the future UK water industry needs with respect to the deterioration, performance indicators and risk assessment for buried infrastructure assets were identified and defined. A road map was drawn up that defined a route towards achieving (developing and implementing) an effective risk based management strategy. Because a key driver for change within the industry is the use of the UKWIR Capital Maintenance Planning Common Framework (CMPCF) in developing a risk informed business case for PR09, the roadmap specifically reflected the CMPCF approach.

In considering how best to take this forward in the sewerage sector WRc identified that a significant number of the needs identified at the workshop could be readily achieved by building on the existing risk based approach embodied in the Sewerage Rehabilitation Manual (SRM). Further drivers were identified to meet the needs of government policies.

In ‘Making Space for Water’ (MSFW) Defra proposed an integrated view of all urban drainage problems involving a variety of stakeholders. Integrated Urban Drainage Management (IUDM) is being developed in response to the recommendations made by the NAO (National Audit Office) in the context of “out-of-sight / out-off-mind”. The historical SRM Drainage Area Plan (DAP) process is being updated to reflect the interactions with these other key components of sewerage management.

The challenges of Defra’s MSFW initiative and climate change mean that the major drainage systems (e.g. rivers and watercourses) must start to be suitably managed as

well as the minor drainage systems (e.g. drains and sewers). The SRM Update will incorporate components to enable this to be suitably addressed.

The implementation of the Water Framework Directive (WFD) requires a strategic approach to sewerage services management at a river basin catchment scale. Clearly the speed and manner of addressing such matters will be established in conjunction with the UK regulators. Appropriate links to facilitate the preparation of river basin management plans will also be incorporated in the SRM Update procedures.

Potential changes in the ownership of private drains and sewers will fundamentally change the composition of a company's sewerage assets and bring associated sewerage services management challenges. Sewerage utilities typically have little knowledge of private drains and sewers, which, when they fail, have a direct impact on customers.

EN752, which details the European approach to sewerage rehabilitation planning (as part of CEN1997b) is currently being updated and deals with a number of the above issues in outline. Publication is due in late 2006/early 2007. It is desirable that the principles in EN752 are followed in the UK, although it is not mandatory.

MD212 sets out Ofwat's expectations for improvement in the sewerage service provision. The new approach set in MD212 is more focused on a sustainable forward-looking analysis rather than the historical level of expenditure and performance. It establishes the link between serviceability objectives and customer value (service to customers and the environment and asset performance) with the introduction of serviceability indicators and risk analysis. MD212 also reiterates that both capital maintenance and operational expenditure should be taken into consideration when developing stable serviceability at least cost. Finally, it requires improvements in data and analytical methodologies to assess the economic level of capital maintenance.

The fundamental reason for undertaking sewerage rehabilitation planning is to set the potential interventions required to maintain and enhance the functional serviceability of a sewer system in a risk based financial framework. Interventions include all types of engineering works that could be carried out on a sewer system to maintain or enhance its performance. Risk is the conventional definition of a combination of probability and consequences, and is the risk of failing to meet the prescribed serviceability. Consequences involve both all the costs of doing and the costs of not doing the rehabilitation work and are a complex mixture of direct and social factors. The output from a risk-based approach is a prioritised list of interventions which facilitate the day-to-day running of the business within a planned, justifiable framework providing value for money.

### **The Deliverables of the SRM Update**

The SRM update is currently being financed by most of the English and Welsh Water and Sewerage Companies, Scottish Water, Northern Ireland Water Services and WRc plc. The update will have three broad 'modules' or themes with numerous 'articles' devoted to each module. Module 1 will give a strategic overview, Module 2 will explain the detailed procedures and describe and present tools for facilitating undertaking studies whilst Module 3 the range of interventions with updated guidance. In response to industry requirements for an easy to use friendly format, the modules will not be available in manuscript form, but on a purpose built website

which can be downloaded onto CD. It is planned that the site will become available in stages to the funding parties during 2007.

The SRM website will enable access in a variety of ways to all types of multi-media content, which will be stored within a hierarchy and will support the principle of “3 clicks and you are there”. Within content navigation will be provided as will links to “related content”, Frequently Asked Questions and Glossaries, and hyperlinks to other content and sites.

Search facilities will facilitate access through both free text searching and structured searching. Further tailored search options will provide access to categorised amalgamated content such as tables, images, graphs, etc. Over time it is envisaged that the site might support a user community through facilities such as forums, Wikkis, news, most visited content etc. It is anticipated that the front page of the website will look similar to that presented below which is the current development version.



The final electronic deliverables are anticipated to be available at commercial rates and in appropriate units (possibly sections within modules) to parties that are not funding the SRM Update. Plans in this area are still developing.

The intention is not to undertake any work which is adequately covered elsewhere but to provide links and acknowledgements to other, relevant sources of information and data (e.g. UKWIR reports) and set them in a wider framework of modern sewerage management. For example, the Urban Pollution Management (UPM) Manual 2<sup>nd</sup>

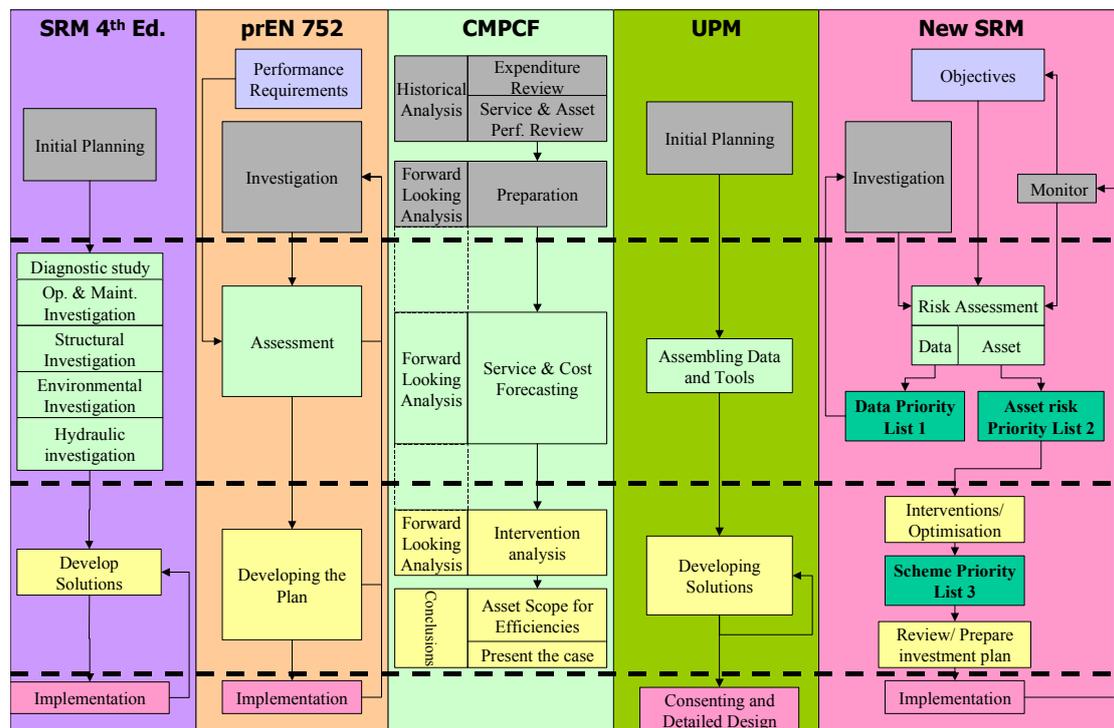
edition, (published by the Foundation for Water Research) will remain a key reference work relating to water quality aspects of sewerage performance. The SRM Update will aim to provide complementary guidance between this established reference work and the new risk based SRM procedures.

### Progress to Date

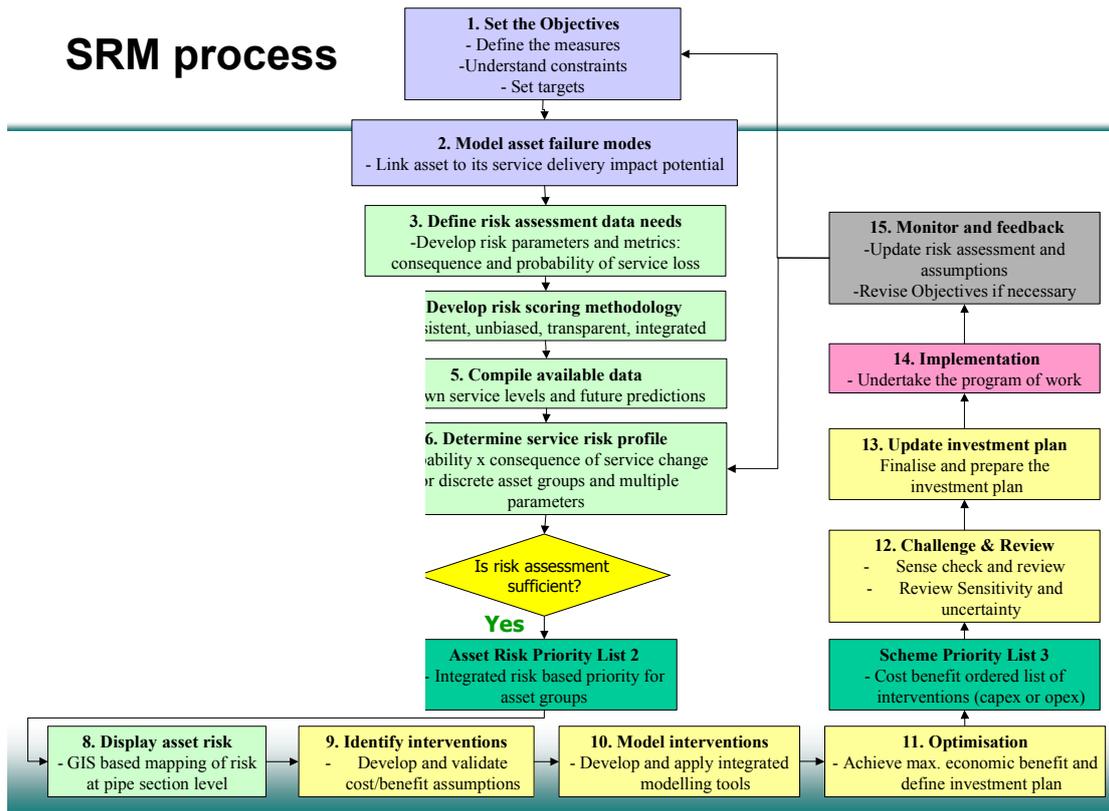
The work so far has concentrated on confirming the validity of the technical approach embodied in the current SRM to a risk-based financial plan. Already this is challenging some of the long-held aspects of the philosophy, for example the appropriate spatial unit to use for particular aspects of technical study ( ranging from the individual pipe to the entire area of the sewerage undertaker, and the relevance of sewer criticality in a risk-based context. Even the definition of the SRM acronym is being reviewed to reinforce a new identity!

Much effort has gone into defining how the technical steps of the four main phases of the current SRM relate to the steps in the various approaches described above and how they will be related in the SRM Update. This is illustrated diagrammatically below at the highest level, and is now being developed in detail for Module 1. This is leading to the definition of the information and data that will need to be included in Module 2.

## Mapping the various approaches



The SRM Update process will therefore be similar to that defined in the diagram below.



The “Lists” referred to in the diagram above will be prioritised schedules of expenditure based on a risk / performance / value approach that will feed into company business plans. It is envisaged that these Lists will be dynamic and updated on a regular basis as information / data becomes available to adjust the priority ranking, or new initiatives involving the sewer system become apparent.

The new process is essentially a risk assessment cycle, consistent with the CMPCF, whilst developing a level of detail beyond that of the CMPCF that will provide essential advice on methodologies and tools that will support the sewerage investment planning and management process for PR09 and beyond.