SEWERAGE - THE NEXT 10 YEARS

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Introduction

This paper seeks to review the changes in sewerage management practices that have occurred over the last 10 years and to assess the benefits that have accrued from them. Against this background, the current challenges facing the industry are identified and potential solutions examined. Looking further ahead, changes which are to be anticipated over the next 10 years are suggested, together with the types of developments in management practices which will take place in response.

The Past

In the early 1970's the water industry recognised that there were significant inadequacies in the way in which sewer systems were planned and operated. The National Assessment of 1977 was the first serious attempt to identify and quantify these problems and to identify areas where improvement in technology was required. The Sewerage Rehabilitation Manual (SRM) and the Wallingford Procedure (WP) of the early 1980's were the major products developed in response to these needs.

The decade since the introduction of these tools has seen a revolution in management practices. Drainage area planning, and in particular the science of hydraulic analysis, have become the accepted norm throughout the industry. The essential supporting activities of sewer system data collection and short term flow surveys have become equally well established. The industry has developed a structure and the resources necessary to allow widespread implementation of this technology. As a result, the level of understanding which the industry now has about the assets it possesses below ground is light years ahead of that of a decade ago and far better use is being made of those assets to meet the needs and expectations of the customers. Moreover, major savings have been made in capital expenditure which would otherwise have been essential to meet required levels of service.

It is interesting at this point in time to contrast these benefits with the reservations and objections that were put forward by certain practitioners at the time of introduction of the SRM and WP. Costs of the hardware and software; costs of data collection both for the basic sewer system layout and particularly for short term flow surveys; time and the specialised skills required to carry out the modelling investigations; limited availability and capacity of computing resources; the validity of simplified system representation and verification against minor storm events were all raised as major objections to the practical implementation of this technology. More indirectly, the capability to plan and quantify the occurrence of flooding, possibly of domestic dwellings, was seen as a major issue which laid engineers and planners open to all sorts of abuse.

Time has shown that all of these difficulties, whilst in many cases real, have been successfully overcome. Few would now argue that the benefits which have

skills to use these models can often be in short supply.

However, the industry is committed to achieving the specified environmental standards, which are only likely to get more demanding as time goes by. The financial resources which will be necessary to achieve these targets are enormous, but will be tightly controlled by Ofwat. Moreover, timescales for implementing many of the necessary measures are short, if in particular the UK is to meet its obligations to the EU.

For all of these reasons, it is imperative that full advantage be taken of the capabilities that this new technology gives to the industry as quickly as possible. By so doing it will rapidly be found that, as with the previous generation of new tools, the benefits that accrue will far outweigh any disadvantages and difficulties. Early applications of the technology have shown that the increased level of understanding that can be gained from application of these models can allow quite dramatic savings in capital costs of schemes to be identified (25-40%) whilst retaining comparable levels of confidence in the overall environmental performance of the solution. It is a common misconception that use of this type of technology simply allows utilities to get away with doing less work, to "sail closer to the wind"! In reality, what these tools provide is an improved and quantified understanding of each aspect system performance in terms that relate directly to the environmental objectives. This allows solutions to be identified that provide known levels of overall performance with acceptable safety margins built in. Previously the uncertainty concerning system performance, and particularly of individual component performance within that system, was such that inconsistent factors of safety were provided with some components operating "close to the bone", whilst others included massive overdesign which contributed little or nothing to overall system performance levels.

The Future

And what of the more distant future? What further developments will take place to put new pressures upon the industry and require improved technology to achieve compliance?

It is to be anticipated that environmental standards will only move in one direction - to become more stringent, albeit perhaps with a more realistic attitude to relative costs and benefits than might always have been the case in the past. In financial terms, Ofwat has already mapped out the decade ahead and requires year-on-year improvements in efficiency of the utilities.

How is technology going to develop to assist the industry in meeting these objectives?

One certainty is that affordable computing capabilities will continue to expand at a dramatic rate. The comparison of the early mainframe based applications of WASSP and the current PC and workstation software is clear to see. There is every reason to believe that this rate of enhancement will continue, or even accelerate, over the next decade. This will facilitate major improvements in models and software packages. One area in which such improvements will be implemented is in data handling and processing. Already Hydroworks and other software packages are allowing convenient pre and post processing of data in ways which could only be dreamed of a few years ago. GIS and database packages are becoming more sophisticated such that in 10 years time all the conceivable information about all sewer lengths throughout a