

3rd Asset Management Plan drawing to a close learning lessons adds value for Southern Water

by
Michelle Gumbrell MCIWEM, B.Eng (Hons) CEng
&
Wayne Middleton CEng, MICE, MIEAust

The third Asset Management Plan period (K3) in the UK water industry is drawing to a close and the last of the capital schemes are approaching completion. *Black and Veatch Costain*, appointed by Southern Water in 2001 to execute the K3 West Area programme as a co-located, fully integrated team with Southern Water, based at Horsham WTW, have delivered approximately £110 million of projects across Sussex, Hampshire and the Isle of Wight. The remainder of the Southern Water K3 programme has been undertaken by *Morrison Brown and Root (MBR)* in the eastern counties of the water company's region.



Lyndhurst WTW: Upgrade incorporating chemical dosing & tertiary moving bed sand filters

courtesy: Southern Water

The Joint Venture Alliance environment between *Black and Veatch Ltd* and *Costain Ltd (BVC JV)* has encouraged a joint culture which has in turn ensured an efficient design delivery process incorporating value-for-money engineering, constructability, programme benefits and risk management.

One of the main perceived benefits of the Joint Venture Integrated team was standardisation of design across the K3 West programme. Wherever possible, designs for standard process units, such as primary and humus tanks, were re-used and adapted to suit individual site conditions, thereby reducing the design phase of the programme and allowing for standard construction practices throughout the programme.

During the programme, *BVC* developed a number of tools to improve and enhance delivery of the schemes for Southern Water. By establishing 'live' documentation within the project team, such as registers of lessons learnt, innovations and scheme savings, the *BVC JV* was able to ensure that project issues were effectively managed and future schemes benefited from the experience of the project teams, both in design and construction. Regular meetings were held with the *MBR JV*, responsible for the K3 East Area programme, to transfer and share knowledge.

To date, the K3 West team has undertaken almost 70 schemes. These include quality improvements and enhancements to waste water treatment works (WwTW) and water supply works (WSW), upgrading combined sewer overflows (CSOs), some elements of asset maintenance and laying bulk water supply mains.

Some examples in which the *BVC JV* has delivered successfully are as follows:

Wastewater treatment works

There were 33 wastewater treatment related scheme in the K3 West programme, valued at £69 million. The briefs required improvements to the discharge effluent water quality standards at these sites (in accordance with the Environment Agency); asset improvements and to comply with company standards for mechanical screening, flow measurement, storm water storage, process treatment, sludge storage, washwater booster sets, power supplies, telemetry and plant availability.

Each scheme solution underwent a vigorous value management and engineering exercise to drive construction costs down. Significant savings were made by many means, including generically challenging the Design Standards, deletion of unnecessary work and re-use of existing structures/plant.



Stockbridge WTW

courtesy: Southern Water

The BVC JV logged over £6.6 million savings for the treatment works.

The challenges encountered during construction and commissioning in all instances included the need to maintain compliance with the existing consent, whilst completing all modifications. This was achieved through careful planning and, where necessary, the use of temporary plant. In addition, Southern Water imposed challenging programmes and completion dates for the schemes. In several instances, the time frame from receipt of a conceptual Brief to achieving consent compliance was less than 18 months. However, all 33 schemes were delivered in time to meet the EA consent compliance deadline.

Combined sewer overflows

There were 36 Combined Sewer Overflows (CSO) related schemes in the programme valued at £36m. As a minimum, the requirements stated in the project briefs were to ensure these sites were brought up to current National Standards for pass forward flow rates, screening and storage. In addition, there were further requirements with respect to power supplies, telemetry and plant availability.

BVC JV either developed individual network models or verified existing models to determine the optimum solutions.

As with the WTW schemes, each CSO scheme solution underwent a value for money exercise to ensure that solutions were appropriate and the lowest construction costs were being achieved. Significant savings were made, often by providing storage solutions and avoiding costlier upgrades to existing pumping stations. Beyond the Lewes CSO Improvement Scheme, the *BVC JV* realised over £2 million of savings on the overall Target Cost for the CSO schemes.

As for the wastewater schemes, despite time constraints, all 36 schemes were delivered to meet the EA consent compliance deadlines.

Consent compliance – 31 March 2005

Although the K3 programme is nearing completion, challenges to the project teams continue. In addition to meeting consent

standards for the K3 period, several of the current schemes have been designed to meet quality standards for the K4 period. This has resulted in additional design, construction and commissioning input to modify and adapt schemes to incorporate additional treatment processes, whilst striving to maintain programmes and minimise costs.

As an example, the use of chemical dosing plants has been incorporated into several treatment works to remove phosphate from the final effluent, thereby meeting the obligations to reduce phosphate levels in final effluent..

There is a need to maintain the momentum to ensure that the March 2005 schemes meet the consent compliance drivers imposed, whilst necessarily scaling down the resources on the programme as a whole in order to continue to deliver the programme within target cost.

Southern Water has advised that the K3 programme delivered many benefits, including:-

- * a 100% record of maintaining consents during construction;
- * technically appropriate projects based around the lowest whole life cost solutions;
- * significant savings in overall delivery costs have been achieved over the life of the programme.

The success of the K3 Joint Venture arrangement between *Black & Veatch Ltd* and *Costain Ltd* has been realised by the successful delivery of the K3 programme in the West Area for Southern Water. The integration of Southern Water personnel into the team, in conjunction with a defined workload, enabled costs savings and standardisation across the programme as a whole.■

Note on the authors: *Michelle Gumbrell is Scheme Project Manager, Black & Veatch; Wayne Middleton is Southern Water SEC Business Manager, K3 West Business Manager*