Benchmarking embedding the common framework

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1 Background

Ewan Group was commissioned by one of the water companies to review their current methods for capital maintenance planning and define the gaps between this and comprehensive asset management procedures.

To carry out the assessment we compared their processes against a variety of assessment frameworks and started to developed a benchmarking framework that combined the best of all of these. The frameworks that we used were:

- The Ofwat assessment of the PR04 submission
- The common framework for capital maintenance planning
- BSI PAS 55 Asset management
- Practice in other water companies

This paper introduces each of these frameworks, defines our vision of comprehensive asset management and sets out a way forward.

2 Assessment frameworks

2.1 Ofwat assessment criteria

Figure 1 Ofwat assessment criteria

	Topic	Weight
Data	Data acquisition	8.2
	Data availability / formats	9.3
	Data confidence grades	2.7
	Degree of reliance on expert judgements	1.5
Process	Risk-based or age / condition?	4.5
	Degree of risk quantification	2.9
	Sub-threshold indicators	4.5
	Top down / Bottom up	5.4
	Reporter involvement	3.6
	Evidence of R&D / Best practice	4.4
	Corporate systems based or stand-alone?	7.7
	Validation / sensitivity checks	12.4
Outputs	Links to company policies	8.1
	WLC approaches	2.6
	Offset uplifts?	7.6
	Efficiency integration	2.2
	Overlaps	2.4
	Well-structured case?	10.1

Ofwat assessed company business plans at PR04 against a set of criteria intended to support good asset planning processes. These are shown in Figure 1. These were also used as part of the assessment of the Scottish Water business plan.

As a tool for assessing asset planning procedures in the water industry the Ofwat framework has the advantage that it has a water company focus and that it gives a definite score to a water company's performance. However it has the disadvantages that it only assesses production of the business plan, not delivery of asset management that its use is almost certain to change in the future in an, as yet, unspecified way.

2.2 The common framework

The Common Framework for Capital Maintenance Planning (Common Framework) is a method, published by UKWIR, of assessing and planning capital maintenance for water industry assets. The method is endorsed by Ofwat and WIC, but its approach would be good business practice even if this was not so. The key principles are that capital maintenance should be:

- Service driven – considering service to customers and the environment
- Risk based – considering probability and consequence of failures of service
- Forward looking – predicting future performance not relying on past spend
- Lowest whole life cost / best value.

The Common framework has three stages:

- Assess historic spending
- Predict future spending
- Reconcile the difference

Stage B is the most important and the steps involved are shown below.

Figure 2 The common framework - Stage B

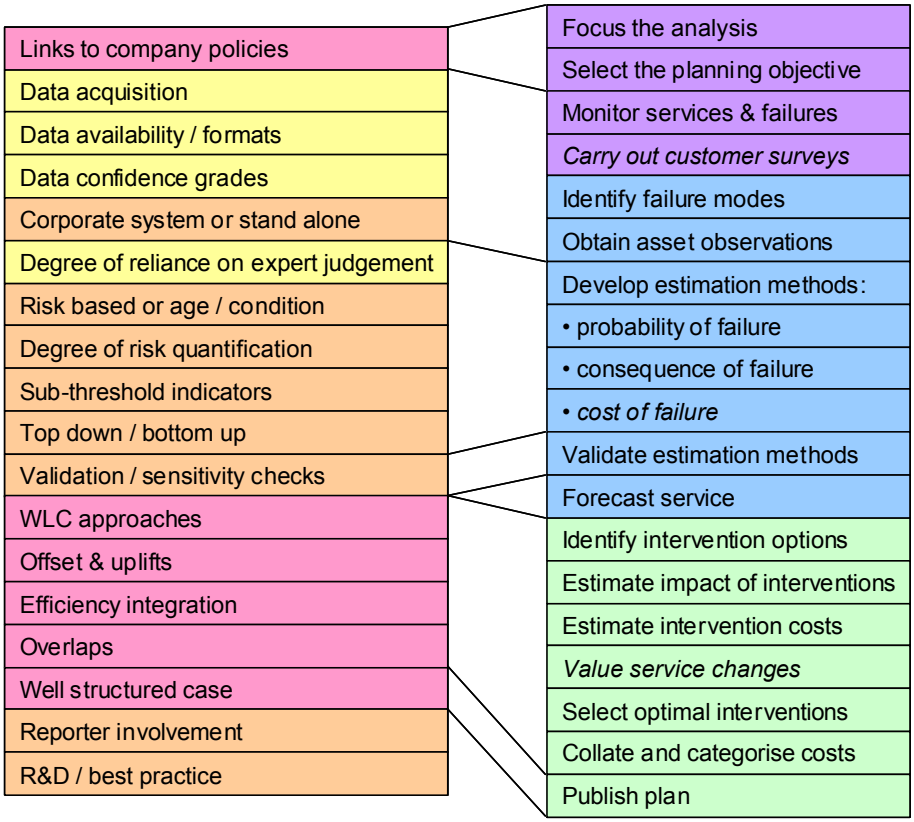
Preparation	Focus the analysis
	Select the planning objective
	Monitor service & failures
	Carry out customer surveys
Service & cost forecasting	Identify failure modes
	Obtain asset observations
	Develop estimation methods for:
	• probability of failure
	• consequence of failure
	• cost of failure
	Validate estimation methods
	Forecast service (do nothing)
Intervention analysis	Identify intervention options
	Estimate impact of interventions
	Estimate intervention costs
	Value service changes
	Select optimal interventions
	Collate and categorise costs
	Publish plan

The common framework has two important advantages as a tool for assessing asset management procedures. It has a water company focus and it is already familiar in the industry. However it has several disadvantages. The focus in on the periodic review process not on managing assets; the process ends with a plan not with delivery. The three stages of the process are very different and need assessing in different ways. These two together mean that it is very difficult to allocate any sort of compliance score to a company's processes.

2.3 Comparison of Ofwat criteria and common framework

It is an interesting exercise to compare the two figures to see how well the Ofwat criteria support the application of the common framework. The agreement is reasonably good although it requires some reordering. However there are some inconsistencies.

Figure 3 Comparison of Ofwat criteria and common framework

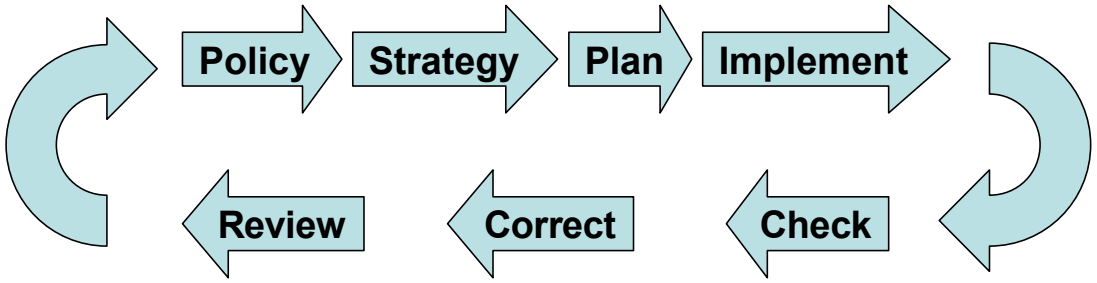


2.4 PAS 55

An alternative framework for assessing the management of assets and capital maintenance is that set out in BSI **P**ublicly **A**vailable **S**pecification 55 "Asset Management". This was developed by the Institute of Asset Management as a guide for all asset intensive industry sectors.

PAS 55 follows the same structure as the ISO 9000 for Quality Management Systems and ISO 14000 for Environmental Management Systems that most people will be familiar with. This is based on a continuous improvement cycle; PLAN, DO, CHECK, ACT.

Figure 4 PAS 55 approach



PAS 55 has the advantage that it covers the full asset management cycle of planning, delivery and continuous improvement and that because of its link to ISO 9000 it is easy to develop audit frameworks to assess compliance.

It has the disadvantages that it is not water company specific and that it needs water company specific guidance for implementation. There is also an incorrect perception that PAS 55 does not adequately address customer service. Its use in the electricity, gas and telecoms sectors is evidence that this is not the case. PAS 55 is driven by company policies and provided that a company has a policy of providing good customer service then this is carried through the whole process to delivery of that service.

2.5 Comparison with other water companies

As part of the project we benchmarked the company's procedures against those in some other water companies through a set of structured intereviews. The intention was that following the interview structure would mean that it was easy to compare procedures at each of the companies. In practice each company is structured in different ways and thinks in different ways and it was not possible to impose a structure on the discussions. The interviews therefore ended up less structured than had been hoped. This therefore provided a major challenge to develop an assessment framework to organise and compare the results of the benchmarking.

3 Embedding the common framework

Both Ofwat and WIC expect companies to strengthen and improve their business planning methodologies so that more robust submissions will be made next time. Ofwat recently set out their position in MD212, which re-emphasised that the principles of the common framework should not be used only for business planning for periodic reviews but also for the day-to-day management of assets between reviews. We refer to this as **embedding** the common framework.

The challenge now is to move the common framework from being an off-line tool used once every five years to being at the heart of the day-to-day asset management processes of the water companies. This has been called **total asset management** by some companies. We see the results of this as:

- Day-to-day asset planning is based on the principles of the Common Framework; that is, it is service-driven, risk-based, forward-looking and based on cost benefit.
- The company has clear policies on the value of level of service and on payback periods that drive the calculation of risk and cost benefit.
- Changes to the asset management plan are made by changing the policies; not by changing the outputs produced from the policies.
- The approach, terminology and assessment of risk are consistent across all asset groups and all drivers so that the needs of each can be balanced. Risk is calculated as £/yr.

- Where possible, risk assessment is based on measured and predicted performance rather than asset condition or expert judgement.
- Budgets are based on cost benefit not ring fenced for particular types of work or groups of assets.
- Risks are recorded against all assets and for all significant risks, preferred interventions are developed to reduce the risk. These interventions include both opex and capex solutions.
- The record of risks and interventions is readily available to all involved in managing and operating the assets.
- Where there are multiple risks against an asset or a group of assets, the interventions are refined through an integrated asset planning process to achieve efficiencies.
- The maintenance programme is efficient and balances; planned and reactive maintenance, Capex and Opex solutions, large and small projects and improvement and replacement needs.
- The maintenance plan is a rolling five-year plan that leads directly to the next five-year business plan in 2009.
- The company knows the best value interventions if something goes wrong and knows the most important interventions if there are insufficient resources to do everything.
- The regulators are confident that a robust maintenance planning process is in place and recognise this is the determination for the next AMP.
- All staff understand and support the vision and the process.

4 Results

The results of our assessment of procedures was:

- There is a wide range of issues in embedding the common framework and no company has achieved it
- Company structures do not support embedding the common framework
- There is a wide range of approaches to predicting asset deterioration
- Prediction of consequence of asset failure is often poor
- Budgets are ring-fenced to asset groups so not optimal
- There is a need to extend the common framework to match the whole asset management cycle as set out in PAS 55
- There is a need to develop a water industry specific assessment / audit framework that could be used with PAS 55

4.1 Assessment / audit framework

As part of the project we developed the outline of a comprehensive assessment framework and also looked at other existing assessment frameworks that could be adapted for the water industry.

The full range of topic areas that we believe need to be assessed in a framework are:

- **Asset ownership and organisation**
- Target setting for levels of service
- Asset and performance data – collection and management
- **Likelihood of failure**
  - **Water infrastructure**
  - **Wastewater infrastructure**

    - Non-infrastructure
- **Consequence of failure**
- Development of interventions
- **Prioritisation of schemes**
- Opex delivery
- Capex delivery
- Checking and review

We have already developed a first draft assessment scoring system for those shown in bold. Each consists of a series of sub-topics that can be scored. Examples of the scoring of some of the sub-topics for the Asset ownership topic are shown below.

There is a formal system of asset management that is; certified to PAS55/ISO9000(3), defined and used(2), under development(1)
Asset policies are; widely available (3), written(2), probably in the business plan(1)

We are continuing to develop this by comparison with ISO 9000 audit frameworks and with so-called reliability scorecards as used in the American oil industry. These have a similar range of topics but include a weighting for each topic.

Figure 5 Reliability scorecard topics

Charter, Organisation, Administration, Training	16%
Values, Culture, Relationships	8%
Risk based inspection	18%
Reliability modelling, prediction, lifetime analysis	2%
Failure analysis (Root cause)	7%
Maintenance requirements analysis (FMEA RCM)	5%
Maintainability for capital projects	5%
Time based preventative maintenance	8%
Proactive maintenance	6%
Reliability improvement	8%
Results / Reliability Program Effectiveness	17%

Figure 6 Reliability scorecard example sub-topics

Results / reliability programme effectiveness	**Score**	**Weighting**
High plant, system and equipment availability	2.7%	
Optimum maintenance costs	2.7%	
Minimum Emergency, break-in work	2.6%	
Few unexpected failures last two years	2.0%	
Failure rate trending down	1.9%	
Total	**11.9%**	**17%**

5 Conclusions

The assessment shows that even the best performing water companies are well short of achieving the vision of embedding the common framework into their day-to-day asset management across all areas of the business.

The barriers to embedding the Common Framework are primarily management will rather than gaps in technical knowledge. There are some gaps in the understanding of asset deterioration and in understanding the cost to customers and society of service failure but these are not insurmountable. The key need is to make the business case that good asset management leads to improved company value.

There is an industry wide need to bring together the philosophy of the Common Framework with the management and auditing framework of the PAS 55 standard to provide a firm system for asset management that can be implemented and can be shown to have been implemented. This should incorporate the key concept of continuous improvement that is not prominent in the Common Framework.

Ewan Group is planning to set up an on-line discussion forum to help exchange knowledge on water industry capital maintenance and assessment frameworks. We have support from Ofwat for this initiative and would welcome support from other organisations. We will shortly announce details of how to access this. Please join in and contribute to the development of total asset management.