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Improvements to the regulatory framework for asset health and operational resilience

Report

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Version control

Rev	Issue date	Revision description	Prepared by	Checked by	Reviewed by	Project approval
1	7 June 2024	Draft for client review	Alex Lane, Alec Yeowell, Greg Tate	Steve Brown	Alex Martin	Zac Alexander
2	1 July 2024	Final addressing client comments	Alex Lane	Alec Yeowell	Greg Tate	Zac Alexander

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Executive Summary

Aims and approach

This project was commissioned by four sponsoring companies: Northumbrian Water, Anglian Water, Wessex Water and Affinity Water.

The project addressed four inter-related concerns with the current regulatory framework which relate to capital maintenance and risks to future outcomes. It comprised two workstreams:

- Workstream 2 led by Reckon reviewed challenges and proposed five packages of reform.
- Workstream 1 led by Jacobs identified and assessed metrics to:
  - Objective 1: Assess how well existing metrics help to reveal future asset health risks and to identify the characteristics of metrics that would help to close any gaps.
  - Objective 2: Understand what types of metrics could be used to improve regulation of capital maintenance.
- To deliver Workstream 1, we compiled, analysed and evaluated more than 400 metrics from the water sector and other sectors. We then defined five categories of metrics that could be taken forward for further development alongside the Workstream 2 packages.

Data

- 456 metrics reviewed, 315 of these unique and 267 of these from the water sector.
- All metrics 'tagged' to eight lenses and all metrics assigned Red/Amber/Green scores against seven evaluation criteria.
- Most of the metrics relate to Resistance and Reliability (the components of resilience most closely associated with asset health). There are very few forward-looking metrics.

Time lens ↓	Resistance	Reliability	Redundancy	Response and Recovery
Retrospective	163	135	39	30
Present-focus	37	38	8	3
Forward-looking	22	22	11	4
Combination	2	2	1	0

← Resilience lens

Note: table shows number of metrics. A metric can relate to more than one component of resilience.

Findings

We identified eight categories of metrics and indices that we think could help to reveal future risks associated with asset health. Five of these categories are higher priority (as they have more relevance to the recommended packages developed in Workstream 2).

Resistance and reliability metrics — C1

Focus on the components of resilience which have the closest link to asset health.

Examples: condition grade, equipment failures

Asset life metrics and indices — C2

Which calculate or indicate remaining asset life in some way.

Examples: cost per year of life, Base Asset Health.

Risk indices — C3

Which calculate an asset risk score often then summarised into risk categories.

Examples: asset risk / network risk (NARM), CRI.

Outcome-based metrics — C4

Which measure outcomes to customers and/or the environment.

Examples: sewer flooding, pollution incidents.

Qualitative, multi-dimension indices — C5

Which assign qualitative scores to a set of discrete categories.

Examples: Overall Equipment Effectiveness.

Linking Packages to Categories

Type of metric	Packages from Workstream 2				
	P1 Base cost models with improved process for Ofwat review of company proposals for additional investment in asset health	**P2** Base cost models with forward-looking and dynamic industry-wide adjustments and enhanced incentives on long-term performance	**P3** Ofwat-owned assessment of capital maintenance with enhanced incentives on long-term performance	**P4** NARM-based funding and delivery accountability arrangements	**P5** Regulatory review of business plans for capital maintenance with granular PCDs
Summary of metric types required under each package and links to Objective 1 categories	Focus of P1 is on refinement to existing approach. No fundamentally new metrics needed. Review of activity metrics also required.	P2 Interested in a range of evidence	P3 Interested in a range of evidence.	P4 is primarily focused on risk metrics.	Fundamentally a different approach – potentially all metric types could be important.

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Executive Summary

Recommendations

We have defined a series of recommendations for the five higher priority metric categories as to how they could be addressed. Our report also identified several common challenges that need to be considered if future asset health risks are to be revealed. We have identified recommended activities to address each common challenge.

Metric Recommendations

Category	Recommendations	Timing
C1. Individual resistance and reliability metrics	• Define a package of reliability and resistance metrics for each asset category.	Q3/Q4 24
	• For higher criticality asset categories first, develop methodologies to produce forecasts of existing or new metrics under defined future scenarios.	2025
C2. Asset life metrics and indices	• Consider different approaches to monetise end of life assessments.	Q3/Q4 24
	• Evaluate how risk could be included in the metric, e.g. refining the idea of tolerable service life.	Q3/Q4 24
	• Test the application of asset life assessments under different future scenarios.	2025
C3. Risk indices	• Engage other sectors to understand strengths and weaknesses of existing indices.	Q3/Q4 24
	• Design and test a risk metric for a selected asset category / categories.	2025
C4. Outcome-based metrics	• Map outcome-based metrics to resistance and reliability metrics.	Q3/Q4 24
	• Review how outcome-based metrics were projected into the future in business plans.	2025
C5. Qualitative, multi-dimensional indices	• Engage other sectors to understand strengths and weaknesses of existing indices.	Q3/Q4 24
	• Consider role for a performance dashboard linked to other categories of metric/index which provide specific information about asset health.	2025

Common Challenges

A: asset types:

- A consistent approach to asset health reporting will require the sector to agree and align with a common taxonomy and classification of asset types. The sector will need to decide whether all asset classes require improved approaches to health assessment and which to do first.

B: future uncertainty:

- The LTDS Common Reference Scenarios recognise that the future is uncertain. To help meaningfully integrate asset health into a planning process it may be necessary to agree a small number of common scenarios than can used to expose performance, service or outcomes under different futures.

C: new regulatory approach concerns:

- There will be concerns, which may slow progress, about the implications for different stakeholders of adopting new packages (of ways) to improve regulation of capital maintenance. Hindcasting methodologies could be developed for packages of improvements to validate expected outputs and behaviours.
- Implementing a form of 'shadow' reporting to put information in public domain e.g. for NARM and Remaining Asset Service Life approach may build the confidence of stakeholders ahead of regulatory changes.

D: asset interventions:

- Presenting consistent and comparable capital maintenance interventions scenarios will help expose perceived maintenance backlogs and future needs and trade-offs. Develop guidance for consistent and comparable maintenance intervention forecasts. e.g. Do nothing, Maintain at historic levels, Maintain at sustainable level. This will help to expose asset health, performance and service trade-offs for different interventions levels. Demonstrating links between metrics and outcomes will help communicate with stakeholders

E: common approaches and assurance:

- All stakeholders will benefit from assurance that the approaches are used in a consistent way and seek to be assured that the projections and forecasts of capital maintenance requirements are transparent and based on appropriate assumptions and evidence.
- Achieving consistency of approach will require reporting guidance and assurance processes to apply check and balances to packages of asset health metrics and capital maintenance information.

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Scope

Problem statement

This project was commissioned by four sponsoring companies: Northumbrian Water, Anglian Water, Wessex Water and Affinity Water.

The overall problem that the project was directed at was a set of four inter-related concerns with the current regulatory framework which relate to capital maintenance and risks to future outcomes. The initial phase of the project comprised two pieces of research:

- A workstream led by Reckon (Workstream 2) investigated potential problems with Ofwat's current regulatory framework, regarding the treatment of capital maintenance expenditure, asset health and risks to customer service and environmental outcomes in the future. It explored potential reforms to the regulatory approach to tackle these problems, including changes to the approach to cost assessment and incentives.

- A workstream led by Jacobs (Workstream 1) identified and assessed a range of metrics that could help to reveal current and future asset health risks and historical trends in asset health, including metrics that could support the potential changes to the regulatory approach identified in Workstream 2.

Aim of Jacobs' workstream: to support the development of an approach to secure long-term resilience of assets and service from sustainable levels of capital maintenance through the development of suitable asset health and/or resilience metrics.

In this context, we had two primary objectives:

1. To assess how well existing metrics help to reveal future asset health risks and to identify the characteristics of metrics that would help to close any gaps.

2. To understand what types of metrics could be used to improve regulation of capital maintenance (linking to Workstream 2).

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