PC15 Information Requirements
Chapter 3 – Capital Investment
Annex 3B – Asset Maintenance Submission

Issued 15 May 2013 – Version 02

Contents

Annex 3B – Asset Maintenance Submission

1.1 Introduction

1.1.1 The requirement for an asset maintenance submission is set out in Section 3.6 of Chapter 3. This annex sets out the information requirements for a plan for asset maintenance in more detail.

1.1.2 The company should submit a plan for asset maintenance which sets out its approach to asset maintenance planning and explains how it has assessed the changes in operational practice and investment required to maintain or enhance serviceability to consumers during PC15.

1.1.3 Within its plan for asset maintenance we expect the company to:

1. Assess and report on its asset maintenance planning capability.
2. Provide historical information on asset maintenance expenditure and explanatory data to allow us to reassess the econometric level of asset maintenance investment.
3. Provide an assessment of serviceability.
4. Provide an assessment of its asset inventory and costing systems.
5. Set out its assessment of future asset maintenance needs.

1.1.4 In our approach to asset maintenance, which was published for consultation in February 2013, the Utility Regulator noted the Capital Maintenance Planning Common Framework (CMPCF) (UKWIR report 02/RG/05/3) which sets out sound principles on asset maintenance planning and a framework for developing and recording asset maintenance plans. The CMPCF is not prescriptive and provides for a range of techniques which can be applied to different groups of assets and at different levels as asset information and observations develop. We expect NI Water to follow the principles and framework set out in the CMPCF when developing its overall asset maintenance plan. However, it is for the company to decide how it can best develop its asset maintenance plan within this framework taking account of its systems, data and capability. We expect the company to report its assessment using the structure of activities set out in the CMPCF.

1.1.5 The implementation of the CMPCF for Business Plan submissions in England, Wales and Scotland has sometimes led to the use of theoretical ‘black-box’ models which cannot be supported by the available data. This type of approach can provide misleading answers dictated by poor quality data. The company is expected to use practical, targeted and transparent methodologies which can be tested and developed as information improves over time.

1.1.6 In our approach to asset maintenance the Utility Regulator set out some of the main techniques available for assessing asset maintenance investment requirements and for developing a plan for asset maintenance. We also identified the information we would

expect the company to provide when it applied these techniques. In broad terms these techniques either:

- establish a base line for the development of the asset maintenance plan; or,
- play a part in assessing the investment necessary to at least maintain serviceability in the future.

1.1.7 In the following sections of this annex we reiterate the information that the Utility Regulator would expect the company to provide to support the asset planning techniques the company might choose to use in its assessment.

1.1.8 We expect the company's plan to:

- Explain the overall approach undertaken and how systems and processes are used to inform asset maintenance planning;
- Set out clearly and concisely how it has assessed the changes in operational practice, levels of investment and levels of activity necessary to maintain services;
- Explain how the company's proposals link to historic cost and serviceability assessments and the outcome of consumer engagement;
- Provide justification for any proposed changes to current levels of service or expenditure;
- Explain the approach adopted for each area of service and the factors that influenced the type of assessment adopted;
- Explain how the assessments undertaken for individual areas have been combined to determine the overall assessment; and,
- Identify any areas where asset maintenance system and data issues limit the company's ability to adopt a forward looking risk based approach and the company's plans, including any associated investment requirements, for addressing these issues.

1.2 Asset Maintenance Baseline

1.2.1 In the following section we outline requirements for a range of techniques which can be used to establish a baseline for assessing future asset maintenance needs:

- Asset maintenance planning capability assessment
- Projection of historical expenditure
- Assessment of historical serviceability trends
- Asset inventory and costing systems

Asset maintenance planning capability assessment

1.2.2 NI Water should prepare and submit a structured assessment of its asset maintenance planning capability as part of its plan for asset maintenance.

1.2.3 A draft copy of this assessment should be submitted to the Utility Regulator on the 6th January 2014 and the company may submit an updated assessment with its Business Plan submission.

1.2.4 The draft asset maintenance planning capability assessment should be accompanied by a report from an independent expert. This report should set out their views on the company's assessment and make recommendations of any more detailed work required to fully assess the company's current asset management capability and its plans to improve its asset management capability. The company should liaise with the Utility Regulator to agree the scope and timing of this independent review to ensure that it is in sufficient depth and that the independent expert is allowed sufficient time to properly assess this critical component of the company's systems.

1.2.5 The capability assessment should be structured in such a way and in sufficient granularity to assess the company's capability to plan asset maintenance of different groups of assets, to improve different elements of service to consumers and/or address the range of policy objectives and the company's strategic objectives which the company plans to deliver. The structure and granularity of the assessment should reflect the different levels of the company's asset management data, processes and general capability. The company should provide the Utility Regulator with an outline of the structure and granularity of its planned assessment and describe how this will meet the broad objectives outlined above before embarking on the detailed assessment.

1.2.6 There are a range of standard processes available to assess asset planning capability, for example the Asset Management Planning Assessment Process (AMPAP), the Asset Management Assessment (AMA) and PAS55. We have concluded that we should not dictate the methodology the company should adopt although we see advantages in adopting a water industry approach. The company should however adopt a recognised methodology which it considers relevant and useful. NI Water should seek the Utility Regulator's approval for its preferred methodology before embarking on the detailed assessment, explaining how the adopted approach will inform both the development of asset maintenance planning and its PC15 Business Plan.

1.2.7 The capability assessment should identify the steps necessary for the company to achieve excellence in asset maintenance planning which would then provide confidence in the company's ability to assess the optimum range of medium term interventions and level of investment required to both maintain serviceability and to target future investment effectively.

1.2.8 The PC15 Business Plan submission should set out the company's plan for closing any gaps in asset management planning capability (including data, systems and processes) and set out the benefits, timescale and cost of doing so.

Projection of historical expenditure

1.2.9 Projection of historical expenditure provides a basic methodology for assessing medium term asset maintenance investment and provides a baseline against which future estimates of asset maintenance can be judged.

1.2.10 The company should include an assessment of historical asset maintenance investment in its submission. The historical cost information submitted should follow the sub-service and asset type breakdown for asset maintenance expenditure detailed in Table 32 of the Annual Information Return.

1.2.11 Historical expenditure data should be entered in the capital maintenance econometric return (CMER) tables which form Appendix A of the information requirements. The company can choose to submit a more detailed breakdown of historical expenditure if this is necessary to support its assessment of future asset maintenance investment for individual asset groups.

1.2.12 The company should set its plans for future investment in the context of historical levels of expenditure and serviceability and explain why estimated future expenditure is different from historical levels of expenditure.

Assessment of historical serviceability trends

1.2.13 Serviceability trends will be used as the primary means of determining asset maintenance outcomes. Historical trends in serviceability will be used to assess whether historical levels of asset maintenance investment have been adequate.

1.2.14 The company should provide its assessment of historical serviceability trends and consider the relationship between historical expenditure and serviceability in its assessment of investment need. The company should justify future asset maintenance investment in terms of the impact on serviceability measures both individually and collectively.

1.2.15 Historical serviceability data should be entered in Table 4.5.

1.2.16 The serviceability data entered in the PC15 business plan submission should reflect the company's best estimate of outturn performance for 2013-14 (calendar year 2013 for quality data). This information will be used to inform the draft determination. Updated serviceability information from AIR14 will subsequently be used to inform the final determination.

Asset inventory and costing systems

1.2.17 The Utility Regulator does not require NI Water to undertake a comprehensive asset valuation for PC15. Instead, the company should:

- Report on the quality of the current asset valuation which it has used to estimate current cost depreciation.
- Report on its current asset inventory and asset costing systems.
- Identify the work necessary to address material gaps in its asset inventory and asset costing systems which would allow the company to:
    - develop a more robust gross and net asset valuation;
    - refresh its estimate of current cost depreciation; and,
    - Improve the medium to long term estimate of asset maintenance investment.

1.2.18 Following a review of the company's submission, we will consider the benefits of asking the company to prepare an asset valuation during the first three years of PC15.

1.3 Assessing future asset maintenance needs

1.3.1 In the following section we outline requirements for a range of techniques which might be used to assess future asset maintenance needs as follows:

- Econometric analysis of historical expenditure by other companies
- Depreciation approach based on modern equivalent asset valuation
- Projections based on asset condition and performance
- Specific asset maintenance plans
- Forward looking risk based assessment

1.3.2 Irrespective of the technique used, the company should demonstrate that:

1. The assessment has been undertaken in sufficient granularity to allow discrete asset interventions and changes in operational practice to be assessed before wholesale replacement is considered.

2. Current efficient costs have been used to estimate the level of investment required and that any future efficiency gains have been assessed, including the efficiency gains which may come from better investment planning.

3. The techniques used provide a robust estimate of the economic residual life of the asset.

4. Equal weight has been given to identifying opportunities to reduce historical levels of expenditure.

Econometric analysis of historical expenditure by other companies

1.3.3 The Utility Regulator will continue to use econometric modelling as part of a triangulated approach for determining the quantum of asset maintenance investment in PC15 and beyond.

1.3.4 NI Water should submit the cost and explanatory data necessary to update the econometric models used in PC10. Cost and explanatory data should be entered in the CMER tables which can be found in Appendix A of the information requirements.

Depreciation approach based on modern equivalent asset valuation

1.3.5 If NI Water chooses to submit a modern equivalent asset valuation in support of part or all of its PC15 submission, it should demonstrate that the underlying asset data, costing systems and residual life estimates are of sufficient quality to inform a determination. In particular, the company should demonstrate how it has used relevant and robust asset observations to assess the residual life of the assets.

Projections based on asset condition and performance

1.3.6 Experience has shown that it is difficult to replicate condition and performance grading over time to establish trends and then link these to the timing of asset maintenance interventions. In view of the weaknesses inherent in condition and performance grading the

Utility Regulator does not require NI Water to undertake a defined condition and performance assessment for PC15.

1.3.7 We will consider any assessment of condition and performance grade the company chooses to use to inform future asset maintenance needs. We would expect the company to demonstrate how condition and performance grades have been used to provide a robust assessment of residual asset life.

Specific asset maintenance plans

1.3.8 The company may opt to prepare specific asset maintenance plans which address current issues and use expert judgement to assess future asset maintenance needs.

1.3.9 Where expert judgement has been used, the company should demonstrate how asset observations have informed expert judgement on residual asset lives. The company should also demonstrate the steps it will take, and the timescale required, to move to a forward looking risk based approach which provides an economic assessment of asset maintenance investment.

1.3.10 The interventions identified through specific asset maintenance plans are often assumed to be in addition to the historical level of investment. The company should consider how it could prioritise specific investment plans within the overall asset maintenance budget derived from historical trends or econometric analysis

1.3.11 The company should identify specific outputs associated with specific asset maintenance plans.

Forward looking risk based assessment

1.3.12 Where possible, the company should provide a forward looking risk based assessment of asset maintenance needs following the structure and principles set out in UKWIR report 02/RG/05/3 – Capital Maintenance Planning a Common Framework and subsequent reports which review the application of the framework and assess its application to specific asset types.

1.3.13 The company should adopt practical, targeted and transparent methodologies which can be tested and developed as information improves over time and it develops and implements this type of assessment. For example:

- The methodology should be able to generate answers at a range of summary levels and generate sample calculations which provide a facility to drill down into the answer, confirm that it has been implemented correctly and allow the impact of material assumptions and data to be identified.
- Asset information should be analysed at a reasonable level of granularity allowing the analysis of discrete assets (or cohorts of assets of similar type), failure modes and service impact.
- The methodology should define individual assets at an appropriate level of granularity to ensure that different failure modes and a range of potential interventions can be considered. For example, a pump comprises a motor, an impeller, a casing, a bearing and seal, instrumentation and valving. An effective analysis will consider failure modes and interventions for these

components as opposed to grouping them as a single asset with a single 'replace pump' intervention.

- There is a risk that the analysis of limited data or the use of external data will generate spurious asset failure rates, service failure rates and deterioration rates. The information used to analyse asset and service failure should be calibrated against current and emerging asset service failure rates to confirm that it is robust.
- Repair costs and repair times used in the analysis should be assessed carefully to ensure that there is sufficient data recorded accurately in the works management system to generate robust parameters. Data should be used in a way which is consistent with the underlying records and analysis used to generate it. For example time to repair assessed from works management systems should take account of the time taken to open and close work orders.
- Repair costs, operating costs and consequential costs should be a realistic assessment of the marginal cost saving which would be achieved if an intervention is applied. Other costs and benefits should be included where they have a material bearing on the analysis and have the support of stakeholders.
- The capital costs for all options included in the analysis should be complete and realistic and reflect current costs incurred by the company.
- Where a stepped change in asset maintenance is proposed to reduce operational costs (for example bringing forward pump replacement to improve energy efficiency) the company should identify the operational savings as 'OPEX from CAPEX'.
- The analysis should take account of the criticality of the asset and its likely impact on service. This would include taking account of time to repair, the time from asset failure to service failure, the provision of stand-by plant and the availability of critical spares either in-house or through the supply chain. For non-critical assets a reactive maintenance policy based on run-to-failure may be the appropriate response. Management interventions to reduce asset criticality, including work order management, spares management and asset monitoring should be considered as part of the asset management plan.
- The analysis should include the opportunity to identify and replace the worst performing assets first to reflect the detailed assessment of interventions which will be carried out in practice. Conversely the assessment should consider how interventions assumed in the asset maintenance plan will be identified in practice. Where necessary the frequency and cost of interventions should allow for the investigation, trial excavations and testing required to identify interventions.
- A wide range of Capex and Opex solutions should be assessed to reflect the range of solutions which are considered in practice. If the analysis favours a particular outcome which does not reflect the balance of work normally carried out, this should be questioned and the reason the analysis suggests a change in practice should be established and tested.
- The analysis should take account of the residual economic value of the asset including potential reuse or resale. This may be significantly different from the residual book value. If the analysis demonstrates that the cost effective plan is to replace assets with a significant residual book value or allow assets to continue in service well beyond their nominal asset lives, the company should advise what adjustments it might need to make to its depreciation accounts to reflect its asset maintenance plan.

- The company should be able to demonstrate that the analysis it carries out for the Business Plan has direct links to asset management delivery. An approach which is used and useful has the advantage of being credible and provides a basis for feedback and learning which will ensure continuous improvement of asset management techniques and inform future asset maintenance plans.

1.3.14 A forward looking, risk based asset maintenance plan can be prepared as:

- a cost effective plan to maintain or achieve a pre-defined level of service; or,
- a cost benefit plan which takes account of consumer willingness to pay and establishes the economic justification for the planned level of service.

1.3.15 We expect the company to develop a cost effective plan which will maintain current levels of service in the short to medium term. The company should draw on the outcome of consumer engagement to support the level of service it intends to deliver. The company should also consider how its asset maintenance planning techniques should be developed to incorporate a full cost benefit analysis. As part of a cost-effective plan, the company should assess the marginal cost of service improvement to inform stakeholders and consumers on the cost of improving service from the current levels of serviceability.

1.4 Consumer Engagement

1.4.1 The company should explain how the results of consumer engagement for PC15 has informed the planned service levels and the identification, assessment and prioritisation of the interventions proposed to deliver and maintain these service levels.

1.4.2 The company should demonstrate how any factors, weightings or rankings used in its analysis have been derived from the results of the consumer engagement surveys.

1.4.3 The company should demonstrate how the proposals in the Business Plan have been tested with consumers to assess their acceptance of the plan.

1.5 Audit and Reporting on the Plan for Asset Maintenance

1.5.1 The draft asset maintenance planning capability assessment should be accompanied by a report from an independent expert. This report should set out their views on the company's assessment and make recommendations of any more detailed work required to fully assess the company's current asset management capability and its plans to improve its asset management capability. The company should liaise with the Utility Regulator to agree the scope and timing of this independent assessment. The final plan should be accompanied by an update of the independent assessment.

1.5.2 This independent assessment may be carried out by the Reporter or, alternatively, by a third party agreed by the Utility Regulator and NI Water.

1.5.3 The scope of the Reporter's audit of the CMER submission is included in Appendix A1 - CMER General Guidance. The guidance recognises that most of the data has already been collected and audited in historic Annual Returns and it is not considered necessary to look in detail at the data again. However, the Regulator reserves the right to ask the Reporter to look at areas where a concern may exist.

1.5.4 The initial serviceability submission of September 2013 will include audit as required for data up to 2012-13. For the Business Plan submission, the Reporter should audit any changes to data previously submitted and should comment on the estimated out-turn data for 2013-14. The Reporter should focus on data for 2013-14 which is materially different from previous trends or targets. The detailed audit of 2013-14 data will be undertaken in the 2014 Annual Information Return.

1.5.5 The Reporter should liaise with the company to prepare an assessment of the company's plans for asset maintenance for PC15 before preparing an audit plan. The Reporter should assess the quality of the information available and assess the material issues and level of testing which will be necessary to challenge the company's plans and output and expenditure projections. The Reporter should then advise the Utility Regulator on the scope and timing of the audit taking account of the quality of information available. Where necessary, the company shall liaise with the Regulator and Reporter to provide sufficient information to allow a robust audit plan to be developed.