

S&S Ofwat Delivering Water2020-Consulting on our PR19 draft methodology August 2017

This response has been compiled by the *Safe and SuRe* (reliable, resilient, sustainable water management) project research team from the **Centre for Water Systems, University of Exeter led by Professor David Butler (d.butler@exeter.ac.uk; safeandsure.info)**.

Our general response by PDF page number (page numbers in parenthesis indicate document page numbers) and responses to specific questions:

Pg 6 (5):

- Bullet 5, Resilience box, 'risks to resilience' – as commented previously this confuses risk and resilience, threats is perhaps a better phrase in such cases but we realise this is a widely used terminology in the sector and permeates all the consultation appendices (e.g. Appendix 4 from the Resilience Task & Finish Group);
- 2 additional resilience-focused common outcome performance commitments (PCs) (what Safe&SuRe would call levels of service) – this is good i.e. commonality/standardisation and we welcome these additions but are surprised they relate so specifically to the resistance and redundancy elements of the now out-dated Cabinet Office (2011) 4 R's of Resilience – see our specific comments in relation to this below;

Pg 10 (9) Section 1.2.2:

- Good recognition that customers affect resilience;
- 'Long-term resilience in the round' 3rd paragraph – *“Resilience is about reducing the probability of water supply interruptions and wastewater flooding, as well as mitigating the impact of any disruption through efficient handling, good communications and quick recovery. It also means longterm resilience to environmental pressures, demographic change, shifts in customer behaviour and the impacts of climate change”*;
- Whilst most of this description is good, the first part *“Resilience is about reducing the probability of water supply interruptions and wastewater flooding”* is not resilience, but risk management. Resilience does not deal with probability, despite its representation in the Arcadis document linked to in Footnote 38, as this document also significantly conflates risk and resilience. The metrics proposed therein do not necessarily incorporate measurement of magnitude and duration of level of service/performance commitment failure and therefore overlook two major elements of resilience. We would further challenge Arcadis' equation on pages 3 and 7 of this document, which has an equation for resilience being equal to risk multiplied by the 4Rs. We do not agree this equation adequately represents resilience. Furthermore, the methodology only relates to specific threats and thus 'specified resilience', not general ones (i.e. unknowns) and therefore cannot assess the failure mode or middle state perspective or what we would term 'general resilience';

Pg 20 (19):

- Long-term resilience in the round – the continued use of the phrase ‘risks’ as in the first 2 bullets could encourage the perception that addressing resilience is possible through traditional risk assessment and risk management. This is not so. Either a different phrase (‘threat’) could be used as previously suggested or Ofwat should ensure that water service providers know that resilience does not mean the same as risk;

Pg 61 (60), Footnote 18:

- We are disappointed to see no academic groups working on resilience metrics included here (such as the previously referred to Centre for Water Systems, Footnote 36);

Pg 92 (91) Table 5.1 Summary Box – PR19 resilience proposals:

- *“We have proposed two specific initial assessment of business plans tests on resilience. **The first relates to the identification of risks to systems and services and the second relates to the appropriate mitigation of those risks.**”*
- What about system and service risks (threats) that are unknown? Do you expect water service providers to identify those? (cyber attacks are mentioned, which is an example, as their probability is unknown, but what about as yet unencountered threats?)
- Having a risk of drought does not necessarily mean you are not or cannot be resilient to it. If a system can respond to and cope with drought, then it is resilient, even if there is the same probability of drought as there has always been. However, being resilient reduces negative consequences, which is where risk and resilience do overlap. You may not be able to reduce the probability of drought, but you can reduce the negative consequences by enhancing resilience;

Pg 95 (94) 5.4 How we see resilience:

- Figure 5.1 – having this as an image is very useful;

General comment:

- We cannot find reference to systematic stress testing in the document (though it may be phrased slightly differently). If water service providers are to benchmark the performance of their systems (infrastructural, financial or otherwise) with regard to resilience, then systematic stress testing is key – otherwise it is not possible to determine what resilient performance might look like (assessing potential failure modes and impacts is vital for this). Consequently, it then becomes difficult to systematically test intervention options (properties) and how they contribute to enhancing resilience (some interventions might increase resilience but reduce sustainability for example or there may be combinations or trade-offs that need examining). Systematic stress testing of systems should therefore be recommended as part of the methodology;

Outcomes Q1. Do you agree with our proposals for common and bespoke performance commitments?

Pg 55 (54):

- Figure 4.1. – Excellently shows the links between Outcomes, PCs and ODIs;

Pg 57 (56) Figure 4.2 and Table 4.2 (pg 60):

- PCs4-8 and 11-14 are certainly reliability (day to day) and resilience (future) based;
- PC9. Risk-based resilience metric (water): drought risk - we would challenge that a resilience metric can be risk-based;
 - We understand that pragmatically for standards a limit (or probability) has to be defined as extreme;
 - It is good that it considers the consequences (provision of standpipes) of the impact of drought;
 - Currently this PC is weak on measuring duration (a component of resilience), is rainfall-only focused and does not consider other system failure modes;
 - An alternative could be to consider the number (frequency), severity (magnitude) and length (duration) of drought-related supply failures/restrictions per time period that result in consequences for customers (e.g. loss of livelihood if water-related). Time period should align with planning periods that capture the extreme events that resilience should address – if droughts have to be considered on a probabilistic basis the time period should consider the probability of more extreme events occurring;
- PC10. Risk-based resilience metric (wastewater): flooding risk - we would challenge that a resilience metric can be risk-based;
 - All of these metrics consider only rainfall extremes as the threats to be countered. Ideally threats other than high intensity rainfall should also be considered, for example what about system failure (e.g. electricity, blockage)? For flooding, disaggregated measures of both magnitude and duration of any negative impacts are required (e.g. number of people affected by flooding under extreme conditions and the total flood and recovery time). Metric (3) in particular does not measure negative impacts (performance) and may not be indicative of resilience;
 - Metric 1 essentially implies rainfall events beyond 1:50 RP are 'extreme' and therefore beyond an agreed (funded) level of service. So this type of approach could assess the magnitude of flooding (numbers affected) – a key resilience performance metric. It does not capture the duration of flooding, that is the response/recovery phase of flooding which is a key resilience performance metric. The term risk should be avoided!
 - Metric 2 could potentially give an indication of CSO operation frequency under extremes. It would need to be disaggregated into magnitude and duration as these are key to understanding environmental impact;
 - Metric 3 is a properties metric (ie. % disconnection) rather than a performance metric;

- We agree with the Water and Wastewater Resilience Action Group (WWRAG) Task & Finish subgroup and the UKWIR project on resilience, that resilience metrics are difficult to develop. This is often because risk and resilience and system performance and properties are conflated.

Resilience Q1. Do you agree with our resilience planning principles?

Pg 97 (96) Section 5.5 Resilience planning principles:

- We are pleased to see attention drawn to the difference between risk and resilience and the improved clarity on this in the revised Resilience Planning Principles;
- We appreciated the reference to academic resilience work as given in Footnote 36;
- We are really glad to see the removal of the phrase ‘resilience risk assessments’ from the draft resilience planning principles given in Section 5.5, as that was a very conflated and confusing phrase;
- We include in Appendix A our suggested additional minor revisions to the Principles to enhance clarity, consistency and chance of implementation;

Pg 20 (19) Box 1.4:

- As previously discussed with Ofwat, there could be better interlinkage between the resilience planning principles by using consistent terminology (naturally resilient water sector, socially resilient water sector (instead of merely ‘customer engagement’), economically resilient water sector (instead of ‘delivering best value’, board assurance’) etc);

Appendix 4, Section 2, Box 1:

- It should be clarified in the main document that the draft principles given here in Appendix 4 are significantly different to those now called draft principles in the main document, to avoid confusion (as they are now very different);
- We have tested the Safe&SuRe terminology, framework and associated interventions with a range of water service providers (Severn Trent Water, Northumbrian Water, South West Water, Scottish Water) and consultants (Arcadis/Hyder, B&V, Arup, Jacobs), as well as other organisations (including Ofwat and CCwater) and received excellent feedback. It could therefore be useful for Ofwat to incorporate Safe&SuRe research and terminology into the Water2020 to complement the existing evidence-based approach used (e.g. T&FG, WWRAG etc) and provide more clarity to ensure resilience and risk are not conflated in the PR19 business plans;

Pg 252 (251) Table 3.3 Proposals for board assurance:

- All of the requirements under the ‘Resilience’ area are clear, interrelated and straight forward for water service providers to achieve (and provide a concise summary of the discussion of relevance given throughout the document);

Resilience Q2. Do you agree with our approach to assessing resilience in the initial assessment of business plans?

Pg 99 (98) Section 5.6 Initial assessment of business plans:

- Test 1 – this does not explicitly state that known and unknown risks (threats) should be included. Water services providers may only be able to assess for unknown threats by assessing the possible failure modes of their systems, but this is not recognised or represented in this initial assessment test (will also require systematic stress testing as previously mentioned);
- Test 2 – what about adaptation, coping, recovery and response options/interventions that are not covered by ‘mitigation’?
- However, we are glad to see mention of this type of approach used by United Utilities in the first paragraph on page 100 (99), but rather than a ‘risk score’ with a ‘likelihood of a bad outcome occurring’ we would suggest Ofwat recommend that consideration be made of how a PC and metric is not met (i.e. it becomes a level of service failure);
- Paragraph 2 – ‘risk assessment’ is mentioned here, but in the Principles it is (rightly) ‘resilience assessment’, this needs to be consistent throughout the document;
- Top of pg 101 (100) – Principle 3 is about customers, not Principle 2 (unless you are referring to the environment, which is a customer, in which case P2 would be correct);
- Top of pg 102 (101) – Scottish Water are starting to do some excellent work on wastewater resilience;

Resilience Q1. Do you agree with our resilience planning principles?

Appendix A

Box 1 - Resilience planning principles

Principle 1: Considering resilience in the round for the long term

The assessment of resilience should show a systematic and integrated understanding of service and systems risk across the entire business. Companies should assess resilience of their systems, and the services they provide, in the round. They should show a clear understanding of the interdependencies across corporate, financial and operational aspects of their business. This assessment should consider short, medium and long-term risks.

- **We would still encourage the substitution of ‘risks’ here with something that also represents non-probability-based challenges, e.g. ‘threats’. This echoes the Ofwat definition of resilience in which the terms disruption, trends and variability are used (risk or risks does not appear in this definition and the term risks is not used in the Resilience Duty section of the Water Act (2014), where**

instead ‘pressures’ is used). Using the term ‘risks’ could be confusing for water service providers and consultants, who are used to doing risk analysis and risk management. These differ from resilience assessment and resilience enhancement.

Principle 2 – A naturally resilient water sector

Resilient ecosystems and biodiversity underpin many of the key services provided by companies. This should be considered as part of the decision-making process for ensuring resilient services, as far as this is consistent with companies’ role as providers of water and wastewater services.

Principle 3 – Customer engagement

Assessments of resilience should be informed by engagement with customers to help companies understand their customers’ expectations on levels of service. This will also help companies understand their customers’ appetite for risk and how customer behaviour might influence approaches to resilience.

- **We are really glad to see the use of the ‘assessments of resilience’ phrase here. Resilience assessments are exactly the right approach to promote.**
- **In line with the phrasing in Principle 2, we would suggest: “Principle 3 – A socially resilient water sector”. This would highlight that ‘customer’ or ‘citizen’ and community resilience are just as important as ecosystem and natural environment resilience and frame it in a language that the sector needs to move to if ‘people’ are to be equally as important.**

Principle 4 - Broad consideration of intervention options

Companies’ plans to manage resilience should consider a full set of mitigating actions and interventions that consider all of the components of resilience, including response and recovery. They should also explicitly consider options that involve cooperation and collaboration with other companies at a regional or even national level where they offer best value (such as transfers and cross boarder planning).

Principle 5: Delivering best value solutions for customers

Companies’ plans to manage resilience should consider the best value solutions for customers in the long term, which may involve long run solutions.

Principle 6 - Outcomes and customer focused approach

Companies’ plans to manage resilience should inform the outcomes they propose. The proposed outcomes on resilience, and the associated stretching performance commitments they set, should also take into account future risks and customer preferences.

Principle 7 - Board assurance and sign-off

Companies' Boards will need to assure us that companies' business plans have been informed by:

- a robust and systematic assessment of the resilience of the company's systems and services;
- customer views on managing resilience; and
- comprehensive and objective assessment of interventions to manage resilience in customers' long-term interests

- **Principle X – an economically resilient water sector**

In the same way that ecosystems have been included in Principle 2 and customers in Principle 3 and our suggestion for re-titling of Principle 3, could some of the principles mentioning financial, business plan and other economic issues be rolled into one Principle on 'economic (or financial) resilience' to provide more clarity?

These three Principles together would then more clearly represent sustainability within the Resilience Planning Principles in line with Ofwat's definition and the Duty as laid out in the Water Act (2014).

They would also better align with Figure 5.1 given in the main consultation document.

- **Visual depiction of the Principles:**

Are Ofwat planning to release some sort of diagram showing that the Principles are not mutually exclusive? i.e. that they all feed in to enhancing water sector resilience? We have attempted (!) below to visualise this in the limited time available (the symbols shown in blue, orange & white were recently produced by Arcadis):

