Briefing Note to Aid Interpretation of
WIS 4-01- 03 (Draft for public comment) - 231122

Revision of IGN 4-01-03

In 2021, the Water UK Standards Board approved the revision of IGN 4-01-03.

The scope for the revision was to provide a clear and precise procedure for testing of polyethylene mains and services.

Notes on scope of revised document

Iron / steel / GRP:

BS EN 805: 2000 specifies the method of test for pipelines of any material excluding thermoplastics (pipes made materials with a viscoelastic behaviour). Issue 2 of IGN 4-01-03 also included a procedure for testing of ductile iron, steel and GRP water and sewerage pressure pipelines which is "*essentially the same as that detailed in BS EN 805*".

Water companies call up both EN 805 and IGN 4-01-03 for testing of ductile iron and steel and it is not clear which takes precedence or whether one is additional guidance to the other. WIS 4-01-03 does not cover these materials and signposts readers directly to BS EN 805, a new version of which is being prepared by CEN TC 164.

PE and PE barrier pipe:

BS EN 805 permits the use of alternative test methods for viscoelastic materials (typically PE and PVC). These can be national methods or where one does not exist, a method given in an informative annex to EN 805.

WIS 4-01-03 will be the specified in the National Foreword to the new version of BS EN 805 as the UK method for testing of polyethylene and polyethylene barrier pipelines.

PVC-U:

PVC-U is not recommended for construction of pressure pipelines in the UK. WIS 4-01-03 does not cover testing of PVC-U pressure pipes. When replacing a section of PVC-U pipe with PE, a test procedure for renewed pipelines is included in the WIS which can be used. The replacement section is not connected to the live main until this test has been successfully completed. This is to avoid the risk of failure of components which are rated below that of the replacement polyethylene pipe either through design or wear and tear.

PVC-O:

PVC-O is manufactured to BS EN 17176. There is currently no manufacturing or testing experience in the UK. WIS 4-01-03 does not therefore cover testing of PVC-O pressure pipes. Manufacturers of PVC-O pipes have been involved in the revision of EN 805 and guidance will be given on testing of these pipes in that document. The method is different to that used for PE in the UK and service providers may not be familiar with the European approach to testing, so in time, the UK water industry may wish to develop its own method of test.

Notes on revision work

Comments were invited before approaching Water UK with a proposal to revise. The key topics to be addressed in the revision were highlighted as follows:

- Provide clear and specific instructions for undertaking a site pressure test for commissioning new sections of pipework – suitable for use by water companies and self-lay providers. (Remove ambiguities, provide clear explanation, delete superfluous / historic content).
- Choice of System Test Pressure – depending on individual interpretation of the guidance in BS EN 805 and the IGN by the water supplier, three different values for System Test Pressure are used for PE pipe. This is causing confusion across the country with different consultants and contractors having to use different pressure tests for the same design with the same pipe in different water companies.(Clarify and explain correct approach).
- Remove contradictions on testing in presence of air and provide specific information on swabbing velocities, reduction of air in pipe.
- High volumes of air in system and poor test set up can lead to unsafe testing conditions.
- Correct the values in Tables A1, A2, A3.
- Acknowledge advances in technology for pressure testing and presentation of results.
- Align terminology as necessary with revised EN 805.
- Improve editorial / grammar.

Key technical changes:

Hydraulic Design: the design requirements for the pipeline to meet intended and future use of the pipeline are clearly differentiated (new clause 4.2.3.1) from the pressure testing activity which is undertaken to prove the leaktightness of the pipeline after construction.

Choice of System Test Pressure: PE pipe manufactured to BS EN 12201 or BS 8588 are designed and tested against transient pressures. The method by which STP is determined for PE pipelines is now clearly stated. The requirement to activate a viscoelastic response to provide a valid test is explained. All other options for STP based on traditional materials are deleted. Example calculations and selection of appropriate STP are provided.

Exposed pipelines: Clear information on the testing of pipelines where there is a risk that the outer surface of the pipes might exceed 20°C is given.

Air content: The conflicting information in the IGN and its appendices has been removed and clear guidance given on the adaptation of the test for air content > 4%. The maximum permissible air content for a valid test is stated. The background information on the effects of air on the pressure test is deleted to allow clear instruction to be given on how to adapt the test and interpret the results. (Note: Withdrawn versions of the IGN are available on the Water UK Standards Board website should historic information be required).

New pipelines test: more precise pass / fail criteria has been introduced.

Renewed pipelines test: the method has been better defined based on field work and experience. Analysis of results and pass/fail criteria are introduced.

Service connections test: a quantitative method of testing service connections (a shorter version of the new pipelines test) is included based on field work and experience.

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Estimated water input: The Appendix has been completely rewritten to combine and correct information. We hope that the presentation is much clearer and would welcome feedback on this specifically. All tables have been corrected. A question is highlighted in red on which we would value feedback.

Key editorial / presentational changes:

(All content relating to the testing of pipelines made of materials other than PE / PE barrier is removed).

Principles of the test procedures used for (a) new mains, (b) renewed mains and (c) service connections are described.

Guidance on activities which are common to all pressure testing, previously spread across several sections and appendices, are set out in Section 4. (Written as "should").

Test equipment: the equipment used for each of the three test procedures (new mains, renewed mains, service connections) is better described.

Instructions for undertaking each of the three test are provided in standalone sections (5, 6, 7). (Written as "shall").

Any relevant content from Appendix D of the previous version (Supplementary information) has been combined and made consistent with the body of the WIS.

J Trew

9/11/22