Appendix B of Information letter 4-2006

Review of comments regarding the Operational Requirements and Code of Practice

The following were queries and comments that have been fed back to the DWI in writing since the issue of Regulation 27 letter 2/2005. Below is provided feedback along with the agreed changes that have been put in place. Whilst it is recognised that some of these comments do not require any action, it was considered useful to provide feedback for all those who had submitted comments and to act as a record of the decision making process involved. Comments were reviewed by nominated certifying bodies, the CPP and DWI. In all cases refer to the Operational Requirements (OR) and Code of Practice (CoP) for full changes.

1. **Common database for Trained staff**

A secure common database for trained personnel and accredited rigs, which could be accessed, by contractors, companies, nominated bodies and DWI would be useful. To date there has been no resource identified to put in place such a database, though the idea was fully supported. Something similar to the UK Skills hygiene database was suggested.

Result : Put forward as a suggestion to the new managers of the Operational Requirements that a common database is developed when hand over of the process occurs from 31 December 2006.

2. **OR 6.11.2 Post cure inspection by utility rep prior to return to service**

The agreed view was that there should not be an issue with the utility representative approving the post cure inspection the day following return to service, as is current practice, rather than the utility representative checking prior to return to service as is required under the new OR, which places constraints on the contractor and utility representative. It appears that immediate on site checking has the potential for a large cost with little benefit to the consumer. It would be sensible for the Company to audit this system.

Result : The following changes shall be made to the OR.

> ***OR 6.11.2 The main shall not be considered for return to service until:***
> ***i) post cure inspections are complete;***
> ***ii) the full air-cure period specified in the IFU has elapsed (if different to the period required before CCTV inspection)***
>
> ***OR 6.11.3 The CCTV inspection (recording or actual survey) and the lining rig printout shall be reviewed and signed off by the Utility Representative within 24 hours of the completion of the lining.***

3. Necessity to relay following identification of water damage

Prior to the new OR it was possible for a contractor to attempt to clean and reline following severe water damage. Expert opinions on this matter differed. Some consider that cleaning and relining is practical, with little risk if the utility representative adequately checks the quality of the cleaning and that there are no mixing issues. Others believe it would not be considered good due diligence if subsequent damage and potential sloughing of lining occurred. Having reviewed the OR (6.12) there is no statement of a requirement to relay following severe water damage. The CoP (4.18.6&7) states that it is 'best dealt with by excavation and replacement with a suitable make up piece'. It does not state that cleaning and relining is prohibited. This implies that a contractor can clean and relay in agreement with the utility representative but it is at the companies risk.

Result : Removal of the statement that longer sections will need to be re-laid from CoP 4.18.6&7. Replace with 'may need to be re-laid'. It is communicated that cleaning and relining following severe water damage is not prohibited, however the company must identify and address the potential risks and decide on the appropriate course of action. Whatever the rectification method conducted must be agreed with the utility representative.

4. Requirement to relay following release of heating fluid.

Some companies use food grade oil or water containing a food grade anti-freezing agent. This would remove the need to relay contaminated pipes. This would seem a sensible way of minimising risk. There is still the need to ensure that any release of heating fluid does not affect the lining.

Result : The following changes shall be made to the OR. Replacement of OR 3.4:4 as it currently stands that any damage to the umbilical results in the main being re-laid with the following:

> ***OR 3.4: 4 All umbilicals shall be used only with food grade oil or water containing a food grade anti-freezing agent. The utility representative should ensure that any release of heating fluid does not affect the lining.***

5. Further research work to ensure mixing is adequate.

Mixing was reported as being an issue with some rapid setting linings. Research was requested via a previous letter to contractors and manufacturers (Appendix C) to fill a gap in understanding. The DWI has only been made aware of one manufacturer having conducted work. Feedback from experts is that it constitutes a breach of Regulation 27 unless a company has written evidence that mixing is adequate.

Result : After 1 January 2007 it constitutes a breach of Regulation 27 if a company lines without written evidence that mixing and spin up is adequate (see Information letter).

OR 3.5: Change to - In-line mixers shall be approved by a Nominated Certifying Body for use with the resin material being applied. Documentary evidence of satisfactory mixing in the in line mixer shall be available

6. **Recognised Fitters length of training required.**

OR 1.3 defines a recognised fitter and supporting information was subsequently provided on behalf of DWI. Only one view was given (6 months)

Result : A 6 month traineeship would seem practical for someone with the appropriate background and experience. This will be incorporated into the guidance document.

7. **Mechanism to appoint recognised fitters**

OR 1.3 defines a recognised fitter and supporting information was subsequently provided on behalf of DWI. Only one view was given (3 years)

Result : Three years working with the rigs to become a recognised fitter at the outset of the OR, as without a recognised fitter it is impossible to become trained. This will be incorporated into the guidance document.

8. **Specifications on lining operatives ID cards**

What is specified on the ID cards in terms of rig is not specified in OR. Suggestions were made on the appropriate level of information to be provided. It is recognised that the training required for one rig and material may be similar to that required for another material and rig. However it has been highlighted that this is not always the case as some materials require specific training. Training is therefore designated as specific to a particular rig type and material type. Training can only be considered transferable to another rig type and material type following consultation with a nominated certifying body who will make an assessment based on the relevant training requirements. If the nominated body considers that training is not transferable then appropriate training as determined by the nominated body must be completed.

Result : What is specified on the ID cards is stated in Appendix B4

In addition add - Training can only be considered transferable to another rig type and material type following consultation with a nominated certifying body who will make an assessment based on the relevant training requirements. If the nominated body considers that training is not transferable then appropriate training as determined by the nominated body must be completed.

9. **Retention of paperwork OR section 7 : 7**

This has been interpreted as retention period from when the lining was conducted.

Result : Change to OR for clarification

OR Section 7 : 7 The water undertaker shall retain all paper lining records (including printouts) for two years from the date of lining, or for the period of the lining contract, whichever is the longer.

10. OR 3.2.5 change to length of hose

Shortening of hoses is a periodic maintenance requirement and does not have a significant impact on rig performance. There is therefore no need to inform the nominated certifying body when this is conducted.

Result : Removal of reference to length of hose requirement from the OR, but maintaining the requirement for notification upon hose diameter/configuration changes.

11. CoP 3.2.2 Umbilical line

CoP states umbilical should contain a heating line whereas OR 2.1 and 3.4 require the need for a heated line if in IFU. Variety of views given by experts on the need for a heated line but as the need is covered in the IFU it has been agreed that this should be the primary requirement. If a heated umbilical in not used, the material test conditions must replicate the lowest temperature likely at the time of application. There will be temperature loss in the hose so a worst case calculation of heat loss from lowest temperature batch tank is required and test conditions must be at this lowest output temperature, assuming the longest umbilical and lowest *in-situ* temperature.

Result : Change of CoP 3.2.2 for consistency to agree with a requirement for a heated umbilical only when required in the IFU for that material. Inform CPP to check this when approving material.

12. OR 6.12 overcoating with a different resin.

OR 6.12.3 states that overcoating should only be carried out using the same resin material. Expert feedback questions whether there is the evidence that materials will bond and suggests a small risk of blistering of lining due to exotherm of the new lining and risks about compatibility between different lining types. It was therefore felt overcoating should only be conducted where written evidence from the manufacturers states that this has been investigated and no risks identified.

Result : Change OR 6.12.3

OR 6.12.3 Over-coating shall only be carried out using the same resin material, unless the lining manufacturer has conducted tests to confirm compatibility

between the specific linings which are then stated in the approved lining IFU. Inform CPP to check this when approving material.

13. Increased range of water quality testing.

Testing is now required for chlorine, taste, odour, appearance, coliforms, *E. coli* and turbidity. All of the parameters could be affected by the lining or associated work on the distribution system. Feedback was positive for inclusion of all these parameters, though there was a comment regarding the source of any turbidity, which it is recognised may be caused due to disturbance of the distribution system. It is important that all parameters meet the standards before the main is accepted and it was recognised that a company would wish to satisfy itself that there had been no deterioration in the quality of water from work on its distribution system.

Result : No change to OR

14. Replace fittings following use

Industry practice seems to be to retain fittings where feasible (e.g. hydrants). Feedback noted potential hygiene and discolouration risks, though no specific lining risks. It was considered that the hygiene group should include some guidance in the updated hygiene document. Reference to specific items could then be removed from the CoP.

Result : Pass request to the Water UK hygiene group to make a decision.

15. Stop taps to be closed where possible

CoP 4.2 states to close stop taps where possible. CP 4.7 states stop taps shall be closed. The majority of feedback stated that they should be closed, though one person noted that this was not always possible in practice. On balance it was considered sensible to aim to close all stop taps to minimise risk of consumers drawing contaminated water

Result : Change of CP 4.2 to close all stop taps.

CP 4.2 Include location and closure of all stop taps.

16. Pipe clearance

CP 4.7 requires pipe clearance sufficient to allow end caps to be fitted. Best practice guidance suggests 150mm. All feedback agrees 150mm is most appropriate.

Result : Change of CP 4.7 to 150 mm minimum

CP 4.7 ii) the depth excavated beneath the pipe invert shall be a minimum of 150mm and sufficient to allow secure end caps to be fitted and prevent contamination of the pipe.

17. CCTV cleaning

CP 4.15 requires CCTV equipment and cables to be clean on insertion with no mention of disinfection. Feedback did not suggest any problem with the equipment when disinfecting with a spray or sponge containing chlorine. While it was not considered a likely cause of contamination as it was pre-disinfection, it was seen as good practice to disinfect CCTV equipment.

Result : Change CoP to include a reference to disinfection

CoP 4.15 Site hygiene is important at this stage to avoid contamination of the pipe interior. CCTV equipment including cables shall therefore be clean on insertion It is good practice to disinfect CCTV equipment and cables with 1000 mg/l free chlorine upon insertion to the main.

18. Relaxation of disinfection of fittings.

The CoP does not mention the concentration that fittings are to be disinfected. As the hygiene guidance notes are being updated based on scientific knowledge it is sensible these cover this issue, however from feedback it seems sensible to stipulate 1000mg/l chlorine for disinfecting fittings which would fit with industry best practice. This will be fed back to the hygiene group. There may be a need to adapt CoP 4.17 to take account of new disinfection techniques when the hygiene document has been updated.

Result : Feedback to hygiene group to stipulate concentration to be used and change CP 4.17.

CP 4.17 The main shall be pieced up using suitable couplings that have been disinfected in 1000 mg/l free chlorine.

19. Use of hydraulic pumps

Document currently covers the requirement of the pump operation and performance (Appendix C), therefore different pumps could be used if they meet the criteria. Feedback, where given, was in agreement with this as long as they had appropriate failsafe.

Result: No change to OR or CoP

20. Curing start time.

Defining cure start time. It was suggested this was when the lining machine comes out of the main and feedback agreed with this. This fits with OR 6.10

Result: Update Appendix E and resin lining record to ensure consistency

Appendix E Cure start time (from exit of machine from pipe)

21. Curing time finish

Defining cure finish time. It was suggested this was when the disinfection occurred and also when the post cure inspection occurred, which is what is stated in OR 6.10.

Result: Update Appendix E and resin lining record to ensure consistency

Appendix E Cure start finish (when post cure inspection is conducted)

22. Query regarding the water quality test on the record lining sheet.

There was a suggestion the record would only record the chlorine result and not the microbiology tests. Although it could not be completed at the same time, feedback stated that the record sheet should record that all results were satisfactory, though at the appropriate time. It should not be assumed that results are satisfactory and corrected later if microbiology results are not clear.

Result: Update lining record to make it clear it is for all samples

Resin Lining Record Water Quality Sample (chlorine, turbidity, appearance, taste, odour, coliform, E. coli)

23. Shut down of of rig

Appendix C 6.3 states the rig must abort by shutting down immediately, or shut down in a controlled manner. All expert feedback states that shutdown must be automatic, though some feedback additionally suggests the need for the operator to have the option to shut down in addition if appropriate.

Result: Change OR Appendix C to be clear. This has involved removing the option to abort in a controlled manner.

OR Appendix C 6.3 (p. 33) Any reading that exceeds 10% tolerance shall produce an audible alarm that would be obvious to the Approved Contractor and shall cause the lining to be automatically aborted. Linings must be automatically aborted by the rig shutting down immediately.

24. 95% of mix ratios measured shall be within 5% of required mix ratio

Feedback states that 95% of mix ratios must be within 5% and 100% within 10% for the whole lining. When to abort is up to the contractor/company. The term desirable covers the alarms only and the contractor needs a way of assessing the 95% criteria

Result: Add in detail to make clear

OR Appendix C 6.3 (p. 33) : Within an acceptable lining, 95% of mix ratios measured (not recorded) during the entire length of main by the monitoring system shall be within 5% of the required mix ratio and 100% shall be within 10%. It is desirable that appropriate alarms that would be obvious to the Approved contractor be given if the 95% criterion is not met.

25. Thermal printer output is not considered durable

One company has downloaded info to a disc for the client to print out. This seems acceptable but it is up to each contractor to ensure records stay for the length of time required

Result: No change to OR

26. Manufacturer suggests 3 compressed air filters is not possible

Manufacturer states three filtering devices to prevent contamination is impossible to achieve. Feedback suggested the need for expert input so that air filter performance is specified by level of contaminants passed by the filter, not the number of filters.

Result : Expert advice required on appropriate level of contaminants.

27. Performance of high build

Problems with lining quality of high build products, especially with small diameter mains. Decision required on whether overcoating is acceptable to achieve a desired effect. Expert feedback is that any overcoating with the same material will not affect water quality as long as the IFU has confirmed bonding between materials when overcoating, though it may affect the length of time the lining lasts, which is not a water quality issue. This issue is to be highlighted when the industry takes over, as it is an issue of lining quality not drinking water quality.

Result : No action currently. Feed input into industry

28. Flushing period

Suggestion to remove the one hour flushing period. This originally related to cement lining and later to leaching of organics from epoxy lining. Newer products may not need the same amount of flushing. Reduction could be done from the perspective of

leaching only if evidence exists that it is not a problem. Flushing is also there to remove chlorine

Result: Change OR to allow for a shorter flush only if there is evidence this is not a problem.

OR 6.13.3 After disinfection the main shall be flushed for the period stated in the manufacturers IFU, or if no period is stated then for a period of 1 hour at 0.5 ms or available mains velocity before return to service. It should be checked that chlorine concentrations have returned to background concentrations

29. Competence of nominated body to accredit recognised fitter

There is some concern that nominated bodies do not feel competent to accredit this area due to mechanical engineering requirements.

Result : Should be forwarded as a matter of concern when the new system is taken over by the industry. It is for the industry to ensure that its method of certification is conducted by a competent organisation and put one in place if not.

30. Standard of cleaning rather than how to clean pipe

This has been requested to allow for novel cleaning methods. Agreed by all experts feedback.

Result : Change to allow cleaning specification not how cleaning is conducted. This is already detailed in OR 6.1

CoP2.2 Add – Alternative cleaning methods are acceptable if they meet the requirements of OR 6.1 which specifies the quality of cleaning. Alternatives to those above should be checked with a nominated certifying body.