|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | AW | 1 |  | TE | I think a description of the sleeve classifications as was in TD/1 would be useful as part of the introduction along with something listing the type of fills that traditionally have been used e.g., air, cementitious grout, pulverised fly ash, nitrogen, bentonite etc. as this ties in nicely with the sleeve risk ranking work (does this need a reference in the management plan sections?)and leads into the subsequent sections. | Insert descriptions of IGE/TD/1 sleeve classifications.  Insert different types of sleeve fills. | Completed. |  |
|  | RO | 1 |  | ED | Change best practice to good practice throughout the document | Make into good practice guide. | Completed. |  |
|  | TR | 1 | 1 second sentence | GE | We imagine that this document was based on gas industry standards as it does not seem to cover the Valero situation where the sleeve annulus is not filled with nitrogen or any other material. |  | Introduction now includes air filled sleeves.  Fig 2 now refers to non-conducting fillings. |  |
|  | RS | 3.1.6 |  | ED | Make up to 3 reasons and add extra point | Add the high pressure rubber connecting hoses to the other 2 potential areas for leakage. | Completed. |  |
|  | RS | 3.2.1 | 3 | TE | The sleeve that was removed from Bacton was only one quarter full of grout, therefore, we can’t assume that the sleeves have been completely grouted.  Are we assuming that PFA Grout and Bentonite are both going to be in an electrically consuctive state. We recently removed a sleeve from Bacton, which contained PFA Grout, which was completely dry. |  | Noted. No change. |  |
|  | RO | 3.2.1 |  | TE | It refers to class 1 sleeves in IGEM/TD/1 and the reference is Ed 5.  I think we need to make it clear that this referring to sleeves designed to class 1 of Editions 1 or 2 of IGE/TD/1.    Perhaps we need an introductory statement to introduce the classes of sleeves similar to that in section 12.7.5.3 (b) in IGEM/TD/1 Ed 5 – Pipelines designed, constructed and maintained to either Edition 1 or Edition 2 of IGE/TD/1 may have sleeves ……….. etc etc | Reference in section 3.2.1 should be to IGE/TD/1 Editions 1 and 2.  Sleeve classes of IGE/TD/1 should be introduced in section 1. | Completed. |  |
|  | GP | 3.2.1 |  | TE | With regard to section 2.2.1, we discussed an update to incorporate sleeves which have a non-conducting filling (SABIC have some sleeves like this). I think we agreed a small change to the flowchart which would allow this type of sleeve to be incorporated, but such a change does not appear in the revised strategy | Add ‘including non-conducting fillings, in section 3.2. | Completed. |  |
|  | TR | 3 | 1 | TE | There doesn’t seem to be a separate algorithm to deal with sleeves/casings that are not filled or charged with anything.  Perhaps you could make it clearer whether the ‘another fill’ algorithm in section 2.2 covers these scenarios.  If not, could we have an additional algorithm developed? | Section 3.2 (with reference to Figure 2) to make clear that it covers ‘non-conducting fillings, including air-filled sleeves’. | Completed. |  |
|  | TR | 3.2.1 | 1 | TE | Please could you confirm this paragraph, as again it may be an issue for cases where the sleeves were not originally designed to be filled.  Our system often contains sleeves which are separated by the carrier pipe by insulating plastic spacers, but there is no void fill around these.  It may also be worth referencing the area classifications from ASME B31.4 or 8 along with the IGEM/TD/1 standards as these are also widely recognised, and more frequently used in non-gas industries | Section 3.2 (with reference to Figure 2) to make clear that it covers ‘non-conducting fillings, including air-filled sleeves’. | Section 3.2 updated.  Comment on ASME area classifications was a misunderstanding so not included. |  |
|  | TR | 3.2.1 | 4 | TE | Please see comments above (and GP comment 7 who has grease filed sleeves) | Section 3.2 (with reference to Figure 2) to make clear that it covers ‘non-conducting fillings, including air-filled sleeves’. | Completed. |  |
|  | TR | 3.2.1 | 2 | TE | It may be worth adding a cautionary note into this section – for example, it could be a straight forward exercise which would only require some simple bonds and the adjustment of TR outputs. However there may be circumstances where the bare sleeve would demand too much current compared to that allowed for coated pipe within the design. | Section 3.2.1 to be updated to cover bare and uncoated sleeves. | Completed. |  |
|  | TR | 3.2.1 | 3 | TE | *“The resistive bond should be configured with an appropriate resistance to create a balanced current drain between the sleeve and pipe sufficient to generate a sleeve to soil polarised potential in the range -0.85 V to -0.95 V, with a pipeline to soil polarised potential 0.1 V more negative than the sleeve to soil polarised potential”* (Section 3.2.1).  The comments we had from our CP specialist were that ‘The 100mV potential difference rule is not going to be a 100% guide to good and bad sleeves as where the annulus is full; or partially full of water; the potential difference may well be greater than 100mV but the situation is not fully satisfactory. Some time ago I put together the attachment on sleeves to give some indication as to the sleeve potential under different circumstances. The value of -750mV is taken as a reasonable criterion for sleeves, as being  the most negative ‘natural’  potential of bare steel in soil without any CP.’  I have attached this document for your reference. | Section 3.2.1 to be updated and reworded. | Completed. |  |
|  | RS | A.1 | 1 |  | Easier said than done, if the sleeves are under motorways, A Roads, railways etc., we will never dig them up to remove a short.  From the bacton sleeve removal, it was evident that the weight of the backfill had forced the centre of the sleeve down, and the insulators had been forced through the pipeline coating. This caused some of the insulators to be smashed due to the pressure exerted. |  | Noted. No change. |  |
|  | RS | A.2 | 1 | TE | We tried various guided wave techniques, and the furthest distance achieved was 17 metres. The CTE coating attenuation absorb the signal. | Update guidance on Long Range Ultrasonics with a cautionary note. | Completed. |  |
|  | TR | A.2 | 1 | TE | It may be worth adding a caveat that Guided Ultrasonic’s (GUL) is primarily suitable as a ‘screening tool’ and cannot be relied on to give quantitative metal loss values.   It is also worth noting that there may be signal attenuation at any spacers or locations where the sleeve touches the carrier pipe, resulting in ‘blind zones’ behind these where the GUL may not be capable of detecting corrosion or metal loss.  This should be evaluated when investigating/determining the effectiveness of any GUL survey. |  |  |  |
|  | RO | Appendix A |  | ED | I suggest that the figures and tables are made Figure A1, Figure A2….., Table A1, Table A2 …. etc otherwise we have more than one Figure 1 etc. | Renumber figures and tables. |  |  |
|  | RO | Appendix A |  | GE | I am not able to comment technically on Appendix A – can we make sure that we get comments from other CP experts in the group. | Ensure suitable review and governance. | Peer review conducted by Ian Thompson of DNV GL. |  |
|  | RO |  |  | TE | Include reference to the DNV GL risk ranking report. | Include reference to report in sections 3 and 4. | Completed. |  |
|  | TR | 1 |  | GE | Re-worded penultimate paragraph to For pipelines designed to ASME codes (e.g. ASME B31.4 or 8) no sleeve classification is given. However, ASME B31.4 Para 403.1 states *“the design shall provide reasonable protection to prevent damage to the pipeline from unusual external conditions that may be encountered in river crossings, offshore and inland coastal water areas, bridges, areas of heavy traffic, long self-supported spans, unstable ground, vibration, weight of special attachments, or forces resulting from abnormal thermal conditions. Some of the protective measures that the design may provide are encasing with steel pipe of larger diameter...”*. Therefore, for the purpose of this document sleeves on ASME B31.4 pipework can be viewed as analogous to Class 2 sleeves in IGE/TD/1. | Insert suggested text. | Completed. |  |
|  | TR | 3.2 |  | ED | Added word ‘For’ to section 3.2 | Insert suggested text. | Completed. |  |
|  | TR | 3.2.1 |  | TE | Should this read “For the carrier pipe to be effectively protected it is necessary that the annulus is completely filled with a **NON-**conductive material”? It currently refers to it being filled with a conductive material. N.B.ASME B31.4 states in 461.1.7 “*The*  *carrier pipe should be insulated from metallic casings*, and the casing ends should be sealed with a durable material to minimize the accumulation of solids and liquids in the annular space. *Special attention should be given to the casing ends to prevent electrical shorting* due to backfilling movement or settling. *Where electrical isolation is not achieved, action shall be taken to correct the condition by clearing the short if possible, by mitigating the potential for corrosion inside of the casing by, installation of a high resistivity inhibited material in the annular space*, by supplementing cathodic protection or other sound engineering practice. Further information can be obtained from NACE RP 0200.” | No change. | No change.  In the ASME extract, the comment about ‘installation of a high resistivity inhibited material’ is only for where electrical isolation of the casing ends is not achieved. |  |
|  | TR | 3.2.1 |  | TE | As above – document currently states “All sleeves should be completely filled with an appropriate conductive material” which contradicts ASME b31.4 para 461.1.7 | No change. | As above. |  |
|  | BW  (BPA) |  |  | GE | Does read like a gas pipeline standard, not really sure we should be using the gas pipeline terminology in a general/generic pipeline standard? |  | Noted – the natural gas industry has most of the industry pipeline sleeves so it is not too surprising that the document reflects that – inserted a comment to that effect in the Introduction. |  |
|  | BW |  |  |  | It is my understanding that ILI tools have reduced detection capabilities when within a metallic sleeved crossing, hence is it really acceptable to suggest the review is conducted solely on this basis? 3.1.7 |  | No change as confirmation on ILI performance was previously provided by GE PII and Rosen. |  |
|  | BW |  |  |  | What if your company doesn’t have a policy? Or one that provides compliant or non-compliant outcomes? |  | No change. Comment relates to one of the algorithms which has the statement ‘Is configuration of CP system compliant to specification?’ CP systems would usually be compared to some company or industry standard. |  |
|  | BW |  |  |  | Pipelines with sleeves that are 50 years old were not designed (in my mind) to be sealed in any way, typically such a pipeline sleeve will fill with water when the water table is high, hence having a conductive infill, then when the water table is low the water will drain out, leaving all sorts of horrible stuff behind. Other than the gas this is a typical sleeve crossing config. I don’t think it is well covered in the document |  | This is equivalent to a Class 3 construction sleeve, so necessary to monitor sleeve potential to identify pipe/sleeve shorts. Additional guidance provided in section 3.2.1. |  |
|  | BW |  |  |  | What is a high density location? Again NG terminology which is not used by other pipeline operators. |  | Inserted definition and comment in Introduction about document reflecting natural gas industry. |  |
|  | BW |  |  |  | Coated sleeves are a big no no from a CP point of view, not mentioned? |  | Inserted ‘If an external or internal coating (or both) is applied to the sleeve, this will not conduct CP current to the carrier pipe even if conductive annular fills are present in the annulus’. |  |
|  | BW |  |  |  | Resistive bonding of the sleeve to the pipeline – I would not suggest this as it is a maintenance nightmare, the burial of sacrificial anodes adjacent to the pipeline maybe a more suitable method to discharge the unwanted currents whilst also providing CP to the sleeve. | NG would use resistive bonds but not sacrificial anodes. | No change. |  |
|  | BW |  |  |  | 3.2.3 not always CP connections at both ends of the sleeve, as per the document, if only one set of cables this would make the sleeve non-compliant, which is not the case. As sleeves are generally short in length (<20m) one set of CP cables is acceptable. 2 is a bonus! | Remove reference to ‘both ends’. | Completed. |  |
|  | BW |  |  |  | No or little detail on what is required as part of a sleeve management plan? which is the whole point of this document isn’t it? |  | No change. It is considered adequate guidance is provided in sections 3.1.7 and 3.2.4 |  |