
# ACS.VESLP2
# SAFETY ASSESSMENT CRITERIA INITIAL & RE-ASSESSMENT.LPG SINGLE & MULTI SUPPLY GAS STORAGE VESSELS. SERVICE PIPEWORK

| VESLP2 | INITIAL & RE-ASSESSMENT |
|---|---|

**Introduction**

Tests gas safety competence in gas storage vessel connections, from vapour valve outlet to ECV outlet including controls and safety requirements. To include sizing, installing, testing and purging external above and below ground Service pipework.

CBs may adopt Competence and Criteria numbering different to that used in this document.

CB documentation may adopt wording for criteria different to that used in this document, provided the meaning is unaffected.

**Range**

Bulk storage with service pipework above ground and buried below ground, single and multiple supplies,
e.g. distribution network where installation volume and pipe size are within the scope of Liquid Gas UK CoP 22.

**Pre-requisites**

***Initial***
CCLP1 EP, CCLP1 PD, LAV or RPH + VESLP1

or CoNGLP1 PD, LAV or RPH + VESLP1

***Re-assessment***

CCLP1 EP, PD, LAV or RPH + VESLP2 or CoNGLP1 PD, LAV or RPH + VESLP1
(with VESLP1 see below)

**Initial and Re-assessment**

Where VESLP2 is not taken at the same time as VESLP1, VESLP1 requires completing.

**Note: VESLP2 holders prior to March 1st 2022 may still require a test and purge competency (TPCP1)**

**Exclusions**

Positioning and siting of vessels, testing, commissioning, filling and purging vessels, digging and refilling pits and trenches for underground storage and pipework, construction of vessel sites, erection of compounds, foundations and structural vessel supports, pipework containing LPG in a liquefied state, handling delivery of coiled PE pipework, application of pipework protection and any work downstream of isolation valve to property.
PE electro fusion jointing

**References and normative documents**

MIs.
All relevant documents as listed in the Legislative, Normative & Informative Document List (LNIDL), inc.:

- HSL56
- LGUK COP 1- Parts 1 and 2
- LGUK COP 22
- GIUSP
- LGUK COP 25.
- Certification Bodies can use other reference documents where appropriate until industry can provide a suitable reference

ACS.SMB.003.ACRND identifies Normative Documents that should be held by ACs.

**Abbreviations**

AC. Assessment Centre
CB. Certification Body
ECV. Emergency control valve
I. Initial
LP. Low pressure
MIs. Manufacturer's/manufacturers' instructions
M.P. Medium Pressure
OP. Operating pressure
R. Re-assessment
Ref. Reference
VP. Vapour Pressure

**Service Pipework**

| PERFORMANCE CRITERIA | | REF | I | R |
|---|---|---|---|---|
| **1.** | | | | |
| ~~(i)~~ | | | | |
| ~~(ii)~~ | | | | |
| ~~(iii)~~ | | | | |
| ~~(iv)~~ | | | | |
| ~~(v)~~ | | | | |
| ~~(vi)~~ | | | | |
| **2.** | position approved squeeze-off tool and operate on pipe | | ✓ | ✓ |
| **3.** | | | | |
| **4.** | | | | |

## 6 Tightness Testing & Purging

### 6a Tightness test procedure for New LP pipework with air as per LGUK CoP 22 (Test B) Volumes > 0.035m³ operating at 37mbar

| PERFORMANCE CRITERIA | | | |
|---|---|---|---|
| (i) OQ related to Strength Testing connect inline test tee and attach appropriate pressure gauge | | ✓ | ✓ |
| (ii) Introduce air into system until regulator locks up and UPSO activated. | | ✓ | ✓ |
| (iii) isolate pressure source and reduce pressure to tightness pressure | | ✓ | ✓ |
| (iv) stabilization as per calculation | | ✓ | ✓ |
| (v) note reading on gauge | | ✓ | ✓ |
| (vi) Test for TTD | | ✓ | ✓ |
| (vi) note reading; if there is no discernable pressure drop, i.e. < GRM the installation is sound | | ✓ | ✓ |
| (vii) if a drop is discernable, eliminate leak and repeat test | | ✓ | ✓ |
| (viii) complete a Let by test (Test A) | | ✓ | ✓ |
| (ix) remove test tee; turn on tank outlet valve and test all joints with LDF or suitable gas detector | | ✓ | ✓ |

### 6b Tightness Test Existing MP ~~I~~P pipework with LPG Volumes > 0.035m³ as per LGUK CoP 22

| PERFORMANCE CRITERIA | | I | R |
|---|---|---|---|
| (i) Close Downstream valve | | ✓ | ✓ |
| (ii) connect an inline test tee and attach an appropriate gauge | | ✓ | ✓ |
| | | | |
| (iii) open tank outlet valve to charge service pipework to lock-up pressure | | ✓ | ✓ |
| (iv) close tank outlet valve and reduce pressure to that given in relevant table | | ✓ | ✓ |
| (v) Allow for stabilization period and record pressure | | ✓ | ✓ |
| (vi) Test for TTD minutes drop shall be less than GRM | | ✓ | ✓ |
| (vii) note reading; if there is no discernable pressure drop and no smell of gas, installation is sound | | ✓ | ✓ |
| (vii) if a drop is discernable, re-pressurise system and test all visible joints with LDF. Eliminate leak and repeat test until passes | | ✓ | ✓ |
| (viii) complete a Let by test (Test A) | | ✓ | ✓ |
| (ixi) remove test tee; turn on tank outlet valve and test all joints in short VP ~~s~~section upstream of first stage regulator and other joints made after tightness test, with LDF or suitable gas detector | | ✓ | ✓ |

### 6c Purging as per LGUK CoP 22

| PERFORMANCE CRITERIA | | | |
|---|---|---|---|
| **1 Prepare for direct purge** | | | |
| a/ obtain evidence of a tightness test on pipework system | | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| b/ | obtain an accurate plan and description of pipework system | | ✓ | ✓ |
| c/ | select purge points at extremities of pipework sections to be purged | | ✓ | ✓ |
| d/ | carry out procedures to ensure purge gas will not enter Installation pipework | | ✓ | ✓ |
| e/ | ensure appropriate warning notices and labels are available | | ✓ | ✓ |
| f/ | ensure appropriate and sufficient fire extinguishers are situated near vent points | | ✓ | ✓ |
| g/ | take in account specific requirements when purging LPG (OQ) | | ✓ | ✓ |
| h/ | ensure purge points, hoses, vent stacks and flame arresters are correctly sized to permit sufficient flow to maintain required purge rate/velocity | | ✓ | ✓ |
| i/ | check location of vent/fare outlet in open air | | ✓ | ✓ |
| j/ | select suitably sized in-line flow meter and an intrinsically safe gas detector and check they are available for purge | | ✓ | ✓ |
| k/ | identify and select any purge gas cylinders/ equipment required for purge | | ✓ | ✓ |
| **2** | **Purge parameters** | | | |
| a/ | determine the purge volume of pipe and fitting | | ✓ | ✓ |
| b/ | calculate the purge volume of pipework section + purge hose/vent pipe | | ✓ | ✓ |
| c/ | determine min. purge velocity | | ✓ | ✓ |
| d/ | calculate maximum purge time | | ✓ | ✓ |
| e/ | use a correct methodology for vent gas testing | | ✓ | ✓ |
| **3** | **Complete a Direct Purge Air or Nitrogen to Gas** | | | |
| a/ | open all purge points and connect vent stacks with selected method for measuring flow of purge gas | | ✓ | ✓ |
| b/ | open purge section isolation valve to admit gas | | ✓ | ✓ |
| c/ | start timing of purge | | ✓ | ✓ |
| d/ gas | start sampling of concentration of fuel gas within vent gas using a suitable detector at half estimated purge time | | ✓ | ✓ |
| e/ | close vent/flare stack valve when pre-determined level of fuel gas is reached | | ✓ | ✓ |
| f/ | record in-line flow meter reading | | ✓ | ✓ |
| g/ | explain procedure when concentrations are not achieved within purge time | | ✓ | ✓ |
| h/ | remove all purge equipment, plug open ends and test disturbed joints with LDF or gas detector | | ✓ | ✓ |
| I / | complete appropriate purging certificate | | | |
| **4** | **Direct Purging of LPG to Air** | | ✓ | ✓ |
| a/ | carry out all preparation work | | ✓ | ✓ |
| b/ | calculate purge volume , flow rate & purge time. | | ✓ | ✓ |
| c/ | Isolate gas supply & carryout let by test | | ✓ | ✓ |
| d/ | open purge points and vent point valves | | ✓ | ✓ |
| e/ | admit purge air at correct flow rate | | ✓ | ✓ |
| f/ | monitor flow pressure | | ✓ | ✓ |
| g/ | sample purge point after 50% of calculated purge time has elapsed | | ✓ | ✓ |
| h/ | after purge time has elapsed, and a satisfactory vent gas test has been achieved close vent points. OQ if a satisfactory purge is not achieved. | | ✓ | ✓ |
| i/ | remove purge hose and vent stack | | ✓ | ✓ |
| **5** | the recording of pressure & tests results | | ✓ | ✓ |
| **KNOWLEDGE AND UNDERSTANDING** | | **REF** | **I** | **R** |
| 1. | types of copper, galvanised steel and PE pipe and fittings for above and below ground suitability | | ✓ | |
| 1a | Identification of 3 Vapour Pipework phases? | | ✓ | ✓ |
| 1b | correct thread sealant for making joints i.e. range of pressures | | ✓ | ✓ |
| 2. | pipe sizing - including theoretical exercise (excludes network) | | ✓ | |
| 2a | Dealing with existing buried pipework | | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| 2b | precautions for pipework crossing water courses. | | ✓ | ✓ |
| 2c | precautions for pipework crossing above ground. | UKLPG CoP 25 3.3.6 | ✓ | ✓ |
| 3. | Pipe work design, precautions when installing underground pipework, routing, bending, adjacent services, Jointing, building connections, sleeving, depth of cover, marking and recording | UKLPG CoP 25 | ✓ | |
| 4. | use of anti-shear sleeves | | ✓ | |
| 5. | precautions for, and using squeeze-off equipment on PE pipework | | ✓ | ✓ |
| | | | | |
| 9. | PE pipe and fittings for non-domestic applications | | ✓ | ✓ |
| 10. | recognition of suitable PE fusion welds | | ✓ | ✓ |
| | | | | |
| 12. | general requirements for Pneumatic tightness testing (Test B) | | ✓ | ✓ |
| 13. | combining a Strength and Tightness Test | | ✓ | ✓ |
| 14. | GRM & TTD | | ✓ | ✓ |
| 15. | TTD Calculation factors for new and existing Installations. | | ✓ | ✓ |
| 16. | calculate TTD for an installation where it is acceptable to use a water gauge. | | ✓ | ✓ |
| 17. | test equipment requirement where the GRM is 30 mins but a TTD of 90mins is required. | | ✓ | ✓ |
| 18. | Identify when a let by test is required | | ✓ | ✓ |
| 19. | Resetting of a UPSO valve during testing | | ✓ | ✓ |
| 20. | Appropriate purging methods, Direct and Indirect<br>• Air – Nitrogen<br>• Air - LPG<br>• LPG – Air<br>• LPG -Nitrogen | | ✓ | ✓ |
| 21. | planning, procedures and site precautions for carrying out a purge | | ✓ | ✓ |
| 22. | Identify Purge equipment requirements<br>• Valves,<br>• purge points,<br>• purge mediums or equipment i.e. fans or Nitrogen<br>• vent gas testing apparatus<br>• purge hoses & Vent Stack nominal bore<br>• flame stacks and arrestors | | ✓ | ✓ |
| 23. | Minimum flare stack requirements & separation distance | | ✓ | ✓ |
| 24. | vent gas testing and relationship to Purge Time (PT) | | ✓ | ✓ |
| 25. | acceptable % concentration of vent gas testing and measuring devices | | ✓ | ✓ |
| 26. | option & procedure to follow if a direct purge is not completed i.e. purge velocity not achieved | | ✓ | ✓ |
| 27. | planning, supervision & site precautions & information required for purging | | ✓ | ✓ |
| 28. | Test pressure (using propane) for existing pipework operating at Nominal working pressure | | ✓ | ✓ |
| 29. | procedure where tightness test is not completed immediately after the strength test (PE pipe pressure exceeds 350mbar) | | ✓ | ✓ |
| 30. | example calculate TTD for a Nitrogen Test on an existing Installation including fittings: pipework IV = 0.25m3 but fittings unknown | | ✓ | ✓ |
| 31. | volume of Nitrogen required to complete an indirect purge | | ✓ | ✓ |
| 32. | identify test procedure used on pipework pressures > 4 bar | | ✓ | ✓ |
| 33. | General need for continuity of supplies | | ✓ | ✓ |

| | | | |
|---|---|---|---|
| 34. Twin stream systems | | ✓ | ✓ |
| 35. Active monitoring systems | | ✓ | ✓ |
| 36. Testing and service requirements | | ✓ | ✓ |