Strategic Management Board

ACS.CCN1
SAFETY ASSESSMENT CRITERIA
INITIAL.DOMESTIC
NATURAL GAS

ACS.CCN1
SAFETY ASSESSMENT CRITERIA
RE-ASSESSMENT (OF CCN1).
DOMESTIC.NATURAL GAS
+CKR1; HTR1, HWB1, LAU1, CENWAT, DAH1, LEI1, MET1/2, CKHB1, DFDA1

CCN1 INITIAL & RE-ASSESSMENT

Introduction

This Core assessment now incorporates the criteria for combustion performance analysis for delivery from 1st April 2012. This packaged Assessment shall be delivered from 1st April 2012 and shall be downloaded to the national database using the assessment codes CCN1 + CPA1. This will ensure the Candidate's competence in combustion performance analysis is recognised.

Candidates achieving CCN1 from 1st April 2012 do not need to sit CPA1.

Tests gas safety competence in core domestic gas work.

Comprises:
1. Gas safety legislation and Standards.
2. Gas emergency actions and procedures.
3. Products and characteristics of combustion
4. Ventilation.
5. Installation of pipework and fittings.
6. Tightness testing and purging.
7. Checking and/or setting meter regulators.
8. Unsafe situations, emergency notices and warning labels.
9. Operation and positioning of emergency isolation controls and valves.
10. Checking and setting appliance burner pressures and gas rates.
11. Operation and checking of appliance gas safety devices and controls.
12. Chimney Standards.
13. Chimney inspection and testing.
14. Installation of open, balanced and fan assisted chimneys.
15. Re-establish existing gas supply and relight appliances.
16. Inspect, test, commission and maintain gas appliances (Re-assessment only).

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

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

Range

All domestic gas fittings.

Pre-requisites

Initial

None. CCN1 (or a suitable Changeover assessment or aligned QCF or S/NVQ) is the pre-requisite for all other domestic Natural Gas safety assessments.

Re-assessment

CCN1.

For Competence 3.18 K&U where CPA1 is not held, or CCN1 sat after 1st April 2012 is not held, or CCCN1 or COCN1 or CCLNG1 sat after 1st April 2012 (for non-domestic premises only) is not held, the Initial criteria have to be met when undertaking Re-assessment.

References and normative documents

MIs.

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

- HSL56
- GIUSP.

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

Abbreviations

AC. Assessment Centre
AIV. Appliance Isolation Valve
AECV. Additional emergency control valve
CB. Certification Body
CFS. Communal Flue Systems
ECV. Emergency control valve
GT. Gas transporter
I. Initial
IV. Installation volume
LDF. Leak detection fluid
LP. Low pressure
MIs. Manufacturer's/manufacturers' instructions
MIV. Meter inlet valve
MOP. Maximum operating pressure
MP. Medium pressure
ND. Non-domestic
OAMI. OFGEM-approved meter installer
OP. Operating pressure
OQ. Oral questioning
R. Re-assessment
Ref. Reference.
* denotes K&U for Initial but PC for Re-assessment.

1. Gas safety legislation and Standards

KNOWLEDGE & UNDERSTANDING		REF	I	R
1.	**HSL56:**			
(i)	Reg.2 General interpretation and application 2 (1),(2),(3),(4),(5) c (iii),(6),(7) & (8)		√	
(ii)	Reg.3 Qualification and supervision 3 (1),(2),(3),(5),(6),(7) & (8)		√	
(iii)	Reg.4 Duty on employer		√	
(iv)	Reg.5 Materials and workmanship 5 (1) to (3)		√	
(v)	Reg.6 General safety precautions 6 (1) to (6)		√	
(vi)	Reg.7 Protection against damage 7 (1) to (3)		√	
(vii)	Reg.8 Existing gas fittings 8 (1) to (3)		√	
(viii)	Reg.25 Interpretation of Part E		√	
(ix)	Reg.26 Gas appliances – safety precautions 26 (1) to (10)		√	
(x)	Reg.35 Duties of employers and self-employed persons		√	
(xi)	Reg.36 Duties of Landlords 36 (1) to (12)		√	

2. Gas emergency actions and procedures

KNOWLEDGE & UNDERSTANDING		REF	I	R
1a.	priorities of actions and responsibilities		√	
1b.	action to stop a gas escape downstream of ECV/AECV		√	
1c.	action if gas continues to escape after turning off supply		√	
2.	limits of flammability		√	
3.	specific gravity and its effect in relation to air		√	
4.	hazardous ignition sources and their elimination		√	
5.	preventing/reducing dangerous concentrations of gas in atmosphere		√	
6.	advice to occupants		√	
7.	HSL56: Reg.37 Escape of gas 37 (1) to (4)		√	

3. Products and characteristics of combustion (see 'pre-requisites' for re-assessment)

PERFORMANCE CRITERIA		REF	I	R
1.	**inspect flame picture of burners visually and identify those indicating:**			
(i)	complete combustion		√	√
(ii)	incomplete combustion		√	√
2.	**identify incomplete combustion in an open flue appliance:**			
(i)	around appliance location		√	√
(ii)	in appliance		√	√
3.	**CO detectors and indicators:**			
(i)	identify detectors and indicators		√	√
(ii)	installation – locations		√	√
(iii)	commission and maintain detectors (audible, readable, visual)		√	√
4.	**Combustion performance analysis:**			
(i)	inspect appliances of 3 flue types intended for combustion performance testing to ensure installation, flueing and ventilation are to MIs		√	√
(ii)	inspect appliances for obvious signs of damage and factors that may affect combustion performance		√	√
(iii)	check OP and/or heat input of each appliance		√	√
(iv)	light each appliance and visually inspect combustion performance		√	√
(v)	check analyser is suitable, correctly assembled and calibrated		√	√
(vi)	select correct types of sampling probe for each appliance		√	√
(vii)	turn on analyser and prepare for use to MIs		√	√
(viii)	correctly position probes for sampling products from each appliance		√	√
(ix)	adjust position of probe to obtain highest steady value of CO_2 or lowest steady value of O_2 for each appliance		√	√
(x)	read and record CO/CO_2 ratios for each appliance		√	√
(xi)	adjust and re-test appliance if CO/CO_2 ratio levels are too high		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	main constituents of complete and incomplete combustion		√	
2.	air required for complete combustion		√	
3.	**causes of appliance incomplete combustion at:**			
(i)	burner		√	
(ii)	combustion space		√	
(iii)	heat exchanger		√	
(iv)	flue		√	
4.	symptoms of CO poisoning		√	
5.	advice to a person who describes symptoms of being affected by products of		√	√

	combustion or when indicator/detector has activated			
6.	other sources of CO and CO_2 in dwellings		√	√
7.	ambient levels of CO in atmosphere		√	√
8.	levels of CO within dwellings and effect on electronic detectors		√	√
9.	causes of activation of CO detectors and indicators		√	√
10.	ambient levels of CO_2 in atmosphere		√	√
11.	critical levels of CO_2 that could cause vitiation affecting combustion process		√	√
12.	movement of products of combustion within properties and its effect		√	√
13.	advice to be given when a CO detector has activated	BS7967 2015 Sect 4	√	√
14.				
15.	manufacturing standards for electronic CO detectors (alarms)		√	√
16.	identify unsafe situation of combustion products that could enter a premises		√	√
17.	additional allowance for CO levels for gas cookers		√	√
18.	**Combustion performance analysis:**			
(i)	re-testing appliances when new components have been fitted		√	
(ii)	unsafe situation category for flued appliance that fails test	GIUSP Ed 7 7.6	√	√
(iii)	unsafe situation category for flueless appliance that fails test		√	√
(iv)	understanding of action levels for gas appliances		√	
(v)	actions if CO/CO_2 ratio remains above suitable performance levels after adjustment		√	
(vi)	types of portable combustion analysers		√	√
19.	Awareness of regional differences in Building Regulations regarding CO detection when installing new or replacement fixed combustion appliances.	GSR ISU 037	√	√

4. Ventilation

* These criteria are K&U for Initial but PC for Re-assessment.

PERFORMANCE CRITERIA		REF	I	R
1.	calculate free area of selection of air bricks (inc. terracotta types) and air vents		√	√
2.	identify correct and incorrect types of air vents and grilles e.g. fly screens		√	√
3.	identify inadequate ventilation		√	√
4.	identify correct and incorrect positioning/location/restrictions of air vents (wall, window, floor, ceiling and ducted) direct to outside/series air vents			√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	requirements for ventilation		√	
2.	siting ventilation (wall, window, floor, ceiling and ducted) direct to outside air; series air vents		√	
3.	restrictions to ventilator/grille locations*		√	√
4.	installing ventilation grilles and vents*		√	√
5.	types of grilles and vents		√	
6.	adventitious air supplies		√	
7.	sizing grilles and vents (free area availability)		√	
8.	**calculating ventilation for:**			
(i)	combustion of open flue appliances*		√	√
(ii)	compartments (open, balanced and fan flue appliances)*		√	√
(iii)	multi–appliance installations (open flue and flueless appliances within same room/space)*		√	√
9.	ventilation for flueless appliances (inc. cooking, water heating and space heating)*		√	√
10.	ventilator location for single and multiple flued and flueless DFE space heaters*		√	√
11.	additional ventilation e.g. extractor fans, cooker hoods, driers etc.		√	
12.	labels and notices*		√	√
13.	effects of oil or solid fuel appliances on ventilation for DFEs*		√	√
14.	effects of double glazing/cavity insulation/draught proofing on ventilation provision		√	
15.	identification and installation of in tumescent air vents*		√	√
16.	operation of passive stack ventilation*		√	√
17.	ventilation for internal kitchens*		√	√

5. Installation of pipework and fittings. Pipe sizes: 6 mm to 35 mm

PERFORMANCE CRITERIA		REF	I	R
1.	join mild steel pipe using appropriate fittings, methods and agents		√	
2.	join copper tube using appropriate capillary end feed fittings, methods and agents		√	
3.	join copper tube and mild steel pipe using appropriate compression fittings, methods and agents		√	
4.	use temporary earth continuity bond correctly		√	
4a.	test supply for gas tightness, isolate, attach temporary earth continuity bond			√

4b.	disconnect meter, cap and make safe			√
4c.	cap or plug all open ends and take all general safety precautions prior to work			√
4d.	install copper capillary fitting adjacent to meter, using appropriate methods and agents			√
4e.	re-connect meter and remove temporary earth continuity bond			√
5.	check work carried out is gas tight		√	√
6.	purge meter and pipework of air. Apply any protective coating (OQ)		√	√
7.	identify installation pipework safety defects		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	copper pipe and fittings standards, suitability and use		√	
2.	mild steel pipe and fittings		√	
3.	copper to mild steel connections		√	
4.	flexible and rigid connections		√	
5.	jointing and cleaning agents for copper and mild steel		√	
6.	pipe supports, clips and fixing for copper and mild steel pipework		√	
7.	**safety requirements for pipework installed:**			
(i)	between joists in floors/roof spaces (solid timber; metal web; timber engineered)		√	√
(ii)	across solid timber joists fitted with flooring		√	√
(iii)	buried in concrete		√	√
(iv)	behind dry lined walls		√	√
(v)	within timber constructed walls		√	√
(vi)	passing through a timber frame/masonry wall - accommodating movement		√	√
8.	external surface mounted pipework		√	
9.	precautions when using an exposed flame when soldering joints on pipework previously containing gas and/or when a gas meter is already fitted		√	
10.	restrictions on use of union and compression fittings		√	
11.	main equipotential bonding (minimum cross sectional area)		√	√
12.	positioning and installation of gas controls and isolation valves		√	
12.	making and breaking gas connections on appliances		√	
13.	ventilation for pipework in ducts		√	√
14.	**HSL56:**			
(i)	Reg.10 Maintaining electrical continuity		√	
(ii)	Reg.18 Safe use of pipes 18 (1) and (2)		√	
(iii)	Reg.19 Enclosed pipes 19 (1) and (6)		√	
(iv)	Reg.20 Protection of buildings		√	
(v)	Reg.22 Testing and purging of pipes 22 (1) and (3)		√	
(vi)	Reg.23 Marking of pipes 23 (1) and (2)		√	
15.	pipe sizing for appliances – inc. theoretical exercise		√	
16.	fixing installation pipework when connected to a meter not securely restrained		√	√
17.	installing fire stopping in buildings containing flats or maisonettes		√	√
18.	installing pipework inside a protected shaft or other fire escape route		√	√
19.	ventilation for protected shafts		√	√
20.	pipework for multi-occupancy buildings		√	√
21.	minimum depth of pipework buried below ground		√	√
22.	pipework installed under base of wall or foundations		√	√
23.	use of PE pipework		√	√
24.	identify unsafe situation where installation pipe from MP meter box directly enters premises through rear meter box spigot		√	√
25.	identify concern for safety and MP gas supply labels			√

6a. Tightness testing and purging. Total IV ≤ 0.035 m³ (LP)

Up to 1¼ (steel) and/or 35 mm (copper)

PERFORMANCE CRITERIA		**REF**	**I**	**R**
1.	**testing new or existing installations with gas or air:**			
(i)	visually inspect the installation to ensure joints made correctly and no open ends		√	√
(ii)	check appliances and ensure AIVs are open		√	√
(iii)	turn off the gas installation at the appropriate valve		√	√
(iv)	connect the pressure gauge to a suitable pressure test point on the installation or, if testing with air, branch of test T-piece		√	√
(v)	if using gas, carry out a let-by test of the closed supply control valve		√	√
(vi)	adjust the pressure to between 7 and 10 mbar.		√	√
(vii)	close the valve and note the gauge reading		√	√
(viii)	test for 1 minute. If pressure rises by more than 0.25 mbar, let-by may be occurring		√	√
(ix)	if pressure rise is observed, check valve by disconnecting its outlet union and applying LDF to valve barrel (OQ)		√	√
(x)	on satisfactory completion of let-by test, slowly raise the pressure in the installation to between 20 and 21 mbar		√	√

(xi) turn off gas or air supply		√	√
(xii) allow 1 minute stabilisation; if necessary re-adjust pressure to between 20 and 21 mbar		√	√
(xiii) check for any perceptible movement (fall) of the gauge over the next 2 minute period		√	√
(xiv) for new installations, or existing installations with no appliances connected check there is no pressure drop		√	√
(xv) for existing installations, check any pressure drop is within permissible values and there is no smell of gas		√	√
(xvi) if installation fails test, trace and repair escape and re-test installation		√	√
(xvii) if tightness test is successful, remove pressure gauge and re-seal test point		√	√
(xviii) when connected to gas, test pressure test point; ECV/AECV outlet connection; regulator connections and, where appropriate, MIV connections with LDF		√	√
(xix) purge installation		√	√
(xx) record test results		√	√
2. locate and repair a gas escape		√	√
KNOWLEDGE & UNDERSTANDING	**REF**	**I**	**R**
1. selection and reading of pressure gauges		√	√
2. allowed pressure drops for existing installations related to meter size/type, pipe diameter and IV with appliances connected to gas supply and not isolated inc. E6, U6/G4, U16/G10 and where no meter is fitted		√	√
3. identify no perceptible movement on gauge (0·25 mbar water gauge and 0·2 mbar electronic gauge reading to 1 decimal place)		√	√
4. allowed pressure drop for existing installation, inc. ECV but no meter is installed e.g. flat where supply is not individually metered		√	√
5. electronic token meter tamper devices and their effect on tightness testing		√	√
6. dealing with ECV/AECV/MIV that is letting by		√	√
7. actions when smell of gas persists (a) after completion of satisfactory tightness test (b) when ECV/AECV/MIV is turned off, or a leaking installation cannot be repaired		√	√
8. testing pipework of diameter > 35 mm or total IV > 0.035 m³		√	√
9. testing prior to alteration or extension to existing installations		√	√
10. acronyms and symbols		√	√
11. calculating IV and PV exercise for E6, U6 and G4 meters connected to 35 mm diameter pipework and U16 meters connected to any pipework of diameter ≤ 35 mm		√	√
12. purging installations of IV ≤ 0.02 m³ and those of IV > 0.02 m³		√	√
13.			

6b. Tightness testing and purging. Total IV ≤ 0.035 m³ (MP)

Up to 1¼ (steel) and/or 35 mm (copper)

PERFORMANCE CRITERIA	**REF**	**I**	**R**
Tightness testing existing NG installations for 75mbar <MOP ≤ 2bar without a MIV (IGE/UP/1B Edition 3 Appendix 4 A4.3)			
1. turn off the gas installation at the ECV		√	√
2. connect the pressure gauge to a suitable pressure test point on the installation		√	√
3. carry out a let-by test of the closed ECV as follows:		√	√
(i) adjust the pressure to between 7 and 10 mbar		√	√
(ii) operate the UPSO or excess flow valve reset to balance the pressures either side of the device, then allow it to re-shut		√	√
(iii) close the ECV and note the gauge reading		√	√
(iv) check for any perceptible movement (rise) of the gauge reading (>0.25 mbar) over the next 1 minute period		√	√
(v) if ECV is letting-by the test is suspended, installation made safe and the appropriate Gas Emergency Service Call Centre immediately notified (OQ)		√	√
4. Slowly raise the pressure in the installation to between 18 and 19 mbar by opening the ECV then turn off the valve		√	√
5. Allow 1minute for temperature and pressure stabilisation, if necessary re-adjust the pressure to between 18 and 19 mbar (the test shall not proceed until a stable reading is obtained)		√	√
6. Continue test as from 6a) 1 (xiii) to (xx)		√	√

7. Checking and/or setting meter regulators

* These criteria are K&U for Initial but PC for Re-assessment

PERFORMANCE CRITERIA	**REF**	**I**	**R**
1. turn off all appliances		√	√

2.	zero pressure gauge and connect to meter test point		√	√
3.	observe and record standing pressure at test point		√	√
4.	**turn on gas appliances and, dependent on appliances available, operate:**			
(i)	boiler – at full rate		√	√
(ii)	space heater – at full rate		√	√
(iii)	cooker – three hotplate burners at full rate		√	√
(iv)	other appliances – at full rate		√	√
5.	read and record OP on gauge (21 mbar)		√	√
6.	**if reading is incorrect:**			
(i)	use procedure for notifying GT for pressures outside 19 – 23 mbar range		√	√
(ii)	apply procedure for OAMI to re-set regulator		√	√
7.	remove gauge and test point; re-seal and test for gas tightness		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	effects of low and high flow rates on regulator outlet pressures (19 – 23 mbar)* (OQ)		√	√
2.	effects of pressure absorption across primary meter installation* (OQ)		√	√
3.	operation of a gas meter regulator		√	
4.	identifying MP meter/regulator installation		√	√
5.	HSL56. Reg.14 Regulators 14(1), (5), (6), (7)		√	

8. Unsafe situations and emergency notices and warning labels

PERFORMANCE CRITERIA		**REF**	**I**	**R**
1.	identify unsafe situations		√	√
2.	classify unsafe situations as ID & AR ~~or NCS~~		√	√
3.	label unsafe appliance(s)/installation(s)		√	√
~~4.~~	~~what to report under RIDDOR~~		~~√~~	~~√~~
~~5.~~	~~when to report under RIDDOR~~		~~√~~	~~√~~
5a.	demonstrate procedure for each unsafe situation to GIUSP		√	√
5b.	complete, explain, issue appropriate warning/advisory notices to appropriate persons		√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	explain dealing with ID installations/appliances	Fig 1 & 6.1 GIUSP Edition 7	√	√
2.	explain dealing with AR installations/appliances	Fig 1 & 6.2 GIUSP Edition 7	√	√
2a	explain dealing with AR installations/appliances when turning off does not remove the risk	Fig 1 & 6.2.2 GIUSP Edition 7	√	√
3.	explain dealing with situations that do not meet current standards but are not unsafe **~~explain dealing with NCS installations/appliances:~~**	Foreword GIUSP Edition 7	√	√
~~(i)~~	~~notification criteria for each category of NCS~~		~~√~~	~~√~~
~~(ii)~~	~~methods of notification~~		~~√~~	~~√~~
~~4.~~	~~explain upgrading from NCS to AR~~		~~√~~	~~√~~
~~5.~~	~~explain dealing with appliances labelled 'Concern For Safety'~~		~~√~~	~~√~~
6.	**identify correct notices and labels to be used:**			
(i)	~~do not use labels, concern for safety labels,~~ MP gas supply		√	
(ii)	warning notice forms		√	
(iii)	advisory notices – ~~sub-standard installation; RIDDOR;~~ appliance use; appliance shut off~~;~~ work in progress; electrical bonding; landlords' records		√	
7.	situations reportable under RIDDOR – explain reporting to HSE		√	√
8.	HSL56. Reg.34 Use of appliances 34 (1) to (3)		√	
9.	**GIUSP:**			
~~(i)~~	~~purpose~~		~~√~~	~~√~~
(ii)	scope		√	√
(iii)	gas incidents		√	√

9. Operation and positioning of emergency isolation controls and valves

PERFORMANCE CRITERIA		**REF**	**I**	**R**
1.	identify incorrectly positioned ECV/AECV/MIV			√
2.	identify correctly positioned ECV/AECV/MIV			√
3.	demonstrate dealing with incorrectly positioned ECV/AECV/MIV			√
4.	correct labels are identified and attached to ECV/AECV/MIV			√

KNOWLEDGE & UNDERSTANDING		REF	I	R
1.	inside meter positions		√	
2.	outside meter positions		√	
3.	**multi-occupancy building installations:**			
(i)	external risers		√	
(ii)	internal risers		√	
(iii)	remote meters		√	
(iv)	types of isolation valve used (AECVs etc.)		√	√
4.	HSL56. Reg.9 (1) to (4)		√	

10. Checking and setting appliance burner pressures and gas rates

PERFORMANCE CRITERIA		REF	I	R
Measure OP of appliance				
1.	assemble and zero a suitable pressure gauge (OQ on electronic gauge))		√	√
2.	dismantle appliance as required; remove pressure test screw, connect gauge via suitable tubing		√	√
3.	light appliance and check and record OP and confirm to MIs		√	√
4.	turn off appliance; remove gauge; replace test screw; re-establish gas and check test point with LDF		√	√
Measure gas rate of appliance				
1.	check and record gas rate using gas meter test dial or index		√	√
2.	check measured gas rate; confirm to MI rated appliance input		√	√
3.	explain requirements for range rated appliances		√	
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	reasons for excessive pressure loss at appliance		√	
2.	effects of excessive pressure at appliance		√	
3.	effects of meter pressure absorption under full load conditions		√	
4.	use of electronic pressure gauge (calibration)		√	

11. Operation and checking of appliance gas safety devices and controls

PERFORMANCE CRITERIA Apply only to those gas safety controls listed in Tables 1 and 3 of the practical provision (ACS.SMB.005.PP.TABLE 1)		REF	I	R
1.	identify gas safety device/control		√	√
2.	check operation of each gas safety control/device is to MIs		√	√
3.	identify gas safety controls/devices that are not working correctly by operation, testing and/or visual/audible methods		√	√
4.	demonstrate diagnosis of faulty gas safety device/control		√	√
5.	isolate gas and electricity supplies, where necessary		√	
6.	repair or replace faulty gas safety control/devices		√	
7.	re-establish gas and electrical supplies, where necessary		√	
8.	check work carried out is gas tight		√	
9.	confirm correct operation of repaired/ replaced gas safety controls/devices to MIs		√	
10.	explain safe operation of gas safety controls/devices		√	
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	appliance data critical for correct spare part identification of gas safety control/devices		√	
2.	demonstrate (explain) principle of operation of each control/device		√	√
3.	explain sequence of operation of control/devices e.g. liquid expansion thermostat fitted in line with a liquid expansion FSD		√	√

12. Chimney Standards

KNOWLEDGE & UNDERSTANDING		REF	I	R
1.	**existing solid fuel chimneys:**			
(i)	suitability – checks required		√	
(ii)	min. size of unlined chimney used for gas fire before terminal is required		√	√
(iii)	min. size of side openings for slabbed over chimneys		√	√
(iv)	min. cross sectional area of new chimney installations – gas fires		√	√
(v)	operation of dampers and restrictor plates		√	√
(vi)	effects of other fuels on chimneys and need for cleaning		√	√
(vii)	min. void dimensions below appliance connections		√	√
(viii)	catchment spaces and standard dimensions/volumes		√	
(ix)	types of flue liners – during construction (salt glazed clay etc.), poured/pumped concrete flue liners, flexible flue liners		√	√
(x)	restrictions on use of poured concrete liners		√	√

(xi)	sealing and support for flexible flue liners in chimneys		√	√
(xii)	inspection of chimneys through loft spaces		√	
(xiii)	chimney height/appliance types where liners are required		√	√
(xiv)	sealing chimney voids		√	
(xv)	fitting bird guards to chimneys		√	√
(xvi)	suitable and unsuitable terminals for space heaters inc. radiant, inset and DFE		√	√
2.	**pre-cast flue systems:**			
(i)	flue design, standards, operation, routing, connection, termination		√	√
(ii)	min. cross sectional area of new gas flue block		√	√
(iii)	min. requirement of vertical flue blocks before off-sets		√	√
(iv)	jointing material for pre-cast flue blocks		√	√
(v)	min. flue size/diameter to connect pre-cast transfer blocks to termination point		√	√
(vi)	effects of temperature on installation of flues		√	√
(vii)	classification of gas appliances - flueless, open flue, room sealed		√	
3.	**chimneys for individual open flue natural draught appliances:**			
(i)	construction and operation of chimney		√	
(ii)	types of chimney material – cement based, and metallic		√	
(iii)	methods of jointing chimney components		√	√
(iv)	termination positions for chimney outlets		√	√
(v)	ridge terminal positions		√	√
(vi)	effects of adjacent structures; basement areas; light wells and retaining walls, on terminal positions		√	√
(vii)	dealing with downdraught on steeply pitched roofs		√	√
(viii)	restrictions to siting and lengths of chimney run to avoid condensation		√	√
(ix)	min. up-stand for chimneys passing through tiled or slated roofs		√	√
(x)	clearances when passing through combustible material		√	
(xi)	chimneys passing adjacent to combustible material or through other dwellings		√	
(xii)	terminals and/or guards – protection against wildlife		√	√
(xiii)	pre-fabricated metal starter box for space heaters		√	√
(xiv)	passive stack ventilation systems in houses, where open flue natural draught appliances are fitted		√	√
(xv)	types of chimney material – cement based, and metallic		√	
(xvi)	sealing flues surrounded by enclosures			√
4.	**fan draught chimneys for open flue appliances:**			
(i)	requirements prior to installing fans in secondary flues		√	√
(ii)	additional requirements when fans are installed in secondary flues		√	√
(iii)	fan dilution and shared open flue, fanned draught systems in domestic dwellings		√	√
5.	**shared open flue chimneys for natural draught appliances:**			
(i)	two or more appliances connected to same flue		√	√
(ii)	appliances with a common flue in same room		√	√
(iii)	labelling appliances on shared flues installed on different floors		√	√
(iv)	maintenance of shared flue systems		√	√
6.	**room sealed natural draught chimney configurations for appliances: (identify 2 positions from (ii) to (v))**			
(i)	balanced flue construction		√	
(ii)	outlet position horizontal to an opening, relating to appliance net input		√	√
(iii)	outlet position below an opening, relating to appliance net input		√	√
(iv)	outlet position above an opening, relating to appliance net input		√	√
(v)	outlet option below gutters, soil pipes, drain pipes and eaves		√	√
(vi)	outlet position in car ports		√	√
(vii)	balanced flue terminal guards		√	
7.	**room sealed fanned draught chimney configurations for appliances:**			
(i)	restrictions on lengths, bends etc. for fanned draught room sealed appliances		√	
(ii)	restrictions for outlet positions inc. horizontal and vertical configurations		√	√
(iii)	enclosing chimneys		√	√
(iv)	proximity of flue duct outlets to boundaries		√	√
(v)	identify unsafe situation of room sealed fanned flue system enclosed without sufficient inspection facility		√	√
8.	**balanced compartments for open flue appliances:**			
(i)	ducted air positioning		√	√
(ii)	cross sectional areas of air inlet ducts		√	√
(iii)	compartment construction		√	√
9.	**room sealed appliances for shared chimneys (SE-ducts, U-ducts and CFS):**			
(i)	construction and operation of SE-ducts, U-ducts and CFS		√	√
(ii)	categories of appliances suitable for installation		√	√
(iii)	chimney outlet positions for roof terminals		√	√

(iv)	labelling air inlet ducts		√	√
(v)	labelling replacement appliances		√	√
(vi)	maintenance of shared flue systems		√	√
(vii)	requirements for replacement appliances		√	√
(viii)	NRV requirements for appliance/exhaust ducts for CFS		√	√
10.	**condensing flues:**			
(i)	condensate disposal position termination for appliances of heat input ≤ 4 kW		√	√
(ii)	plume management kits		√	√
(iii)	differing air inlet duct and terminal positions		√	√
(iv)	terminal guards for plume kit air inlets		√	√
11.	**chimneys for vertex appliances:**			
(i)	construction and operation of vertex chimney		√	
(ii)	minimum height of appliance draught break above roof insulation		√	
12.	**exchange of information and planning for chimneys:**			
(i)	requirements of designer, builder, provider or installer when installing gas chimneys		√	
(ii)	chimney certificates		√	
13.	**HSL56:**			
(i)	Reg.27 Flues (1) to (4)		√	
(ii)	Reg.30 Room-sealed appliances (1) to (3)		√	
(iii)	Reg.32 Flue dampers (2) and (3)		√	

13. Chimney inspection and testing

PERFORMANCE CRITERIA		REF	I	R
1.	**inspect chimney visually throughout its length to verify (both correct and incorrect installation):**			
(i)	fitness for intended appliance		√	√
(ii)	serves only one room or appliance		√	√
(iii)	terminal position meets current legal requirements		√	√
(iv)	joint between terminal and chimney system is weather tight		√	
(iv)(a)	chimney pipe adapter is correct			√
(v)	adequate support		√	√
(vi)	clearance from obstructions		√	√
(vii)	no corrosion or cracking		√	√
(viii)	use of bends meets current requirements		√	√
(ix)	appliance draught diverter correctly installed and in good condition		√	√
(x)	secondary flue correctly positioned and in good condition		√	√
(xi)	starter block correctly sized and positioned		√	√
(xii)	catchment space correct and free from debris		√	√
(xiii)	joints correctly made		√	√
(xiv)	no visual signs of spillage of combustion products		√	√
(xiv)(a)	ridge terminal and flue adaptor boot are correct, in good condition and properly connected			√
(xv)	correct space between flue and combustible material		√	√
(xvi)	flexible flue liner correctly sealed at base and terminal position		√	
(xvii)	seals on balanced natural and fan flues in good condition and correctly installed		√	
(xviii)	balanced flue appliance seals in good condition and correctly installed		√	
(xix)	connection into a pre-lined chimney (clay)is correct			√
2.	**natural draught chimneys, metallic flexible flue liners:**			
(i)	verify annular space around flue and void at base of chimney is correctly sealed (supplementary OQ(s) on effects/hazards of unsealed flue liners and voids)			√
(ii)	check flexible flue liner is correctly clamped and sealed at base and terminal position			√
(iii)	identify incorrect use of flue liners (supplementary OQ(s) on application of flexible flue liners will satisfy this PC)			√
3.	**plastic flue pipe systems:**			
(i)	classify plastic flue			√
(ii)	join plastic flue pipe using correct methods, agents and fittings			√
4.	**chimneys for balanced, fan assisted and vertex flue appliances:**			
(i)	classify balanced/fan assisted and vertex flue systems			√
(ii)	cut flue duct square, assemble, adjust and seal to MIs			√
(iii)	fit correct flue terminal guard			√
(iv)	ensure number of bends within flue length is to MIs (fan assisted)			√
(v)	check seals on balanced natural and fan flues are in good condition and correctly installed			√
(vi)	check balanced flue appliance seals are in good condition and correctly installed			√

(vii)	check vertex flue system operates correctly (supplementary OQ on operation of vertex flues will satisfy this PC)			√
(viii)	min. height of flue break above roof insulation is correct			
(ix)	calculate ventilation for a vertex flue to MIs			√
5.	record incorrect flue installations			√
6.	**apply flue flow test (smoke test) (open flue/chimney systems only):**			
(i)	check adequate air supply for combustion is available to appliance requirements		√	√
(ii)	close windows and doors in room or compartment where flue is to be tested		√	√
(iii)	pre-warm chimney, if necessary		√	√
(iv)	position smoke pellet correctly at base of chimney being tested		√	√
(v)	check smoke discharges from correct chimney or terminal only			√
(vi)	check no entry of smoke into room/compartment or any other room/compartment, roof space or any part external to chimney		√	√
(vii)	rectify any fault found and re-test chimney		√	√
7.	**apply spillage test with appliance connected and in operation:**			
(i)	close windows, adjustable vents and doors in room/compartment containing appliance to be tested		√	√
(ii)	check ventilation and turn off any mechanical ventilation supplied to room, other than combustion air		√	√
(iii)	operate/open any fans or passive stack ventilation systems (extract fans, radon extract fans, circulating fans, ceiling paddle fans etc.)		√	√
(iv)	with appliance in operation at its set input, apply smoke match to appropriate position in appliance to method in MIs		√	√
(v)	check smoke is correctly pulled into appliance chimney		√	√
(vi)	rectify any fault found and re-test appliance (OQ on testing for spillage with all interconnecting doors open with all fans in operation)		√	√
8.	identify defective chimney installations		√	
9.	**check room sealed fan assisted positive pressure appliance installation:**			
(i)	identify positive pressure appliance		√	√
(ii)	fit appliance case correctly (case screws, seals, items trapped between case seal and appliance etc.)		√	√
10.	**check room sealed fan assisted positive pressure appliance case seals for possible leakage of products of combustion:**			
(i)	set appliance controls to highest setting and light burner		√	√
(ii)	check case seal by running a hand around boiler case and back plate (OQ on corroded/ damaged back plate)		√	√
(iii)	light a match/taper and position flame very close to case seal or any possible leakage point		√	√
(iv)	move match/taper around entire seal, inc. bottom of case		√	√
(v)	identify any leakage of products of combustion		√	√
11.	inspection requirements for fanned flues in voids	TB 008 ED3 2013	√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	**room sealed positive pressure combustion chamber appliances:**			
(i)	types		√	√
(ii)	causes of leakage of products of combustion		√	√
(iii)	checks prior to fitting case, inc. back plate inspection, appliance case, screws, case seals etc.		√	√
2.	installation and spillage testing new or used appliances when MIs are not available		√	√
3.	alternative methods of compliance when inspection hatches are not available for flues in voids	TB 008 ED3 2013	√	√
4.	Actions required where fumes, smells or spillage have been reported/encountered	BS7967 2015 2015 6.1	√	√

14. Installation of open, balanced and fan assisted chimneys

PERFORMANCE CRITERIA		**REF**	**I**	**R**
Open flue chimney installation –identify correct and incorrect installations:				
1.	**cement based and metallic rigid:**			
(i)	jointing		√	
(ii)	adapters		√	
(iii)	bends		√	
(iv)	supports		√	
(v)	spacing between chimney and combustible material		√	
(vi)	ridge terminals and ridge tile adaptor		√	

(vii)	flueing into a pre-lined chimney (clay lined)		√	
2.	**flexible flue liners:**			
(i)	joining at base and at chimney outlet using appropriate adaptors		√	
(ii)	clamping at chimney outlet position		√	
(iii)	sealing annular space between liner and chimney		√	
(iv)	sealing voids at chimney base – pipework etc.		√	
3.	plastic flue pipe – flue pipe jointing		√	
Balanced and fan assisted chimney systems –identify correct and incorrect installations.				
1.	**natural draught:**			
(i)	flue duct cuts		√	
(ii)	assemble, adjust and seal to MIs		√	
(iii)	flue terminal guards against balanced flue terminal		√	
2.	**fan assisted:**			
(i)	number of bends within flue duct length is to MIs		√	
(ii)	calculate ventilation for a vertex system		√	
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	insulation for chimneys for open flue appliances		√	
2.	condensing appliance chimneys		√	
3.	chimney maintenance		√	
4.	guards for balanced flue terminals		√	
5.	effects and hazards of inadequately sealed flue liners		√	
6.	incorrect applications of flue liners		√	
7.	identify difference of vertex systems to vertical room sealed chimney configurations		√	

15. Re-establish existing gas supply and re-light appliances

PERFORMANCE CRITERIA		**REF**	**I**	**R**
1.	check installation is gas tight		√	√
2.	re-establish gas supply		√	√
3.	**visually check appliance(s) and re-light inc.:**			
(i)	purge system and appliances of air		√	√
(ii)	re-light appliance(s)		√	√
(iii)	confirm satisfactory operation of user controls		√	√
(iv)	visually inspect appliance installation(s) for unsafe situations	GIUSP App 5	√	√
KNOWLEDGE & UNDERSTANDING		**REF**	**I**	**R**
1.	describe action when an un-commissioned appliance is identified		√	
2.	confirm actions if pipework and appliance(s) are not tested (commissioned) when gas supply is re-established		√	
3.	HSL56. Reg.33 Testing of appliances 33(1) to (3)		√	

16. Re-Assessment. Inspect, test, commission and maintain domestic gas appliances

Candidates undertaking CENWAT or HTR1 shall hold CPA1 (or CCN1 or ND Core Generic Part B where these are obtained from 1st April 2012).

PERFORMANCE CRITERIA	CKR1	HTR1	LAU1	WAT1	CEN WAT	DAH1	LEI1	MET1/2	CKHB1	HWB1	DFDA1
1.check appliance/fittings complete, fit and suitable for use	*	*	*	*	*	*	*	*	*	*	*
2.check gas supply pipe in acceptable position for appliance	*	*	*	*	*	*	*	*	*	*	*
2a.determine pressure in service pipe as LP or MP								*			
3. check appliance and fittings are installed using appropriate materials and fittings, to MIs and Normative Documents	*	*	*	*	*	*	*	*	*	*	*
4. inspect and test burners, injectors, primary air ports, filters, heat exchanger, flue-ways, ignition, FSD, thermostats and other gas safety components for correct operation to MIs	*	*	*	*	*	*	*		*	*	*
5. identify AR & ID ~~and NCS~~ installations	*	*	*	*	*	*	*	*	*	*	*
6. identify suitable and unsuitable locations	*	*	*	*	*	*	*	*	*	*	*
7. check gas safety components for correct operation	*	*	*	*	*	*	*	*	*	*	*
8. identify gas safety faults on components	*	*	*	*	*	*	*	*	*	*	*
1. commission appliance:											
(i) purge of air	*	*	*	*	*	*	*	*	*	*	*
(ii) check operating pressure and/or gas rate at appliance	*	*	*	*	*	*	*	*	*	*	*
(iia) check regulator locks up at 30 mbar when no gas flowing								*			
(iii) check flue safely removing combustion products		*		*	*	*	*		*	*	*
(iv) check supply of combustion air is adequate	*	*	*	*	*	*	*		*	*	*
(v) ensure appliance safe to use	*	*	*	*	*	*	*	*	*	*	*
(vi) check flame picture, stability and ignition	*	*	*	*	*	*	*		*	*	*
(vii) carry out combustion performance analysis to MIs and record		*			*						*
(viii)check appliance working correctly and safely as intended	*	*	*	*	*	*	*	*	*	*	*
(ix) check user's controls operating correctly	*	*	*	*	*	*	*	*	*	*	*
10. explain safe operation of appliance	*	*	*	*	*	*	*	*	*	*	*

KNOWLEDGE & UNDERSTANDING	REF	R
1. **CENWAT:** CO and combustion ratio checks using an ECGA when commissioning a condensing boiler incorporating air/gas ratio control valve technology		√
2. **CENWAT:** 2 or more domestic central heating boilers fitted within a single space with an aggregate total in excess of 70kW	BS6798 (Scope)	√