



Department
of Energy &
Climate Change

GUIDANCE DOCUMENT FOR THE OFFSHORE HYDROCARBON INDUSTRY

ON

THE F-GASES REGULATION (EU) No. 517 / 2014

VERSION ONE: JULY 2015

NOTE: TO USE THE 'HYPERLINKS' PROVIDED IN THIS DOCUMENT, YOU MIGHT NEED TO PRESS THE 'CTRL' KEY AND THEN CLICK ON THE ITEM OF INTEREST. ALL OF THE LINKS IN THIS DOCUMENT WERE FUNCTIONING AT THE TIME OF PUBLICATION.

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1.0 Introduction

1.1 On 9 June 2014, the Fluorinated Greenhouse Gases Regulation (EU) No. 517 / 2014 (hereinafter referred to as either “the EU F-Gases Regulation” or “the F-Gases Regulation (EU) No. 517 / 2014”) entered into force and applied directly in Member States from 1 January 2015 (see paragraph 1.3). The EU F-Gases Regulation aims to protect the environment by reducing emissions of F-gases (i.e. hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆)) from refrigeration, air-conditioning units, electrical switchgear, heat pumps, fire-protection systems and other sources, through:

- (a) establishing rules on the containment, use, recovery and destruction of F-gases, and on related ancillary measures;
- (b) imposing conditions on the placing on the market of specific products and equipment that contain, or whose functioning relies upon, F-gases;
- (c) imposing conditions on specific uses of F-gases; and
- (d) establishing quantitative limits for the placing on the market of HFCs.

1.2 The various Implementing Acts (e.g. on leakage checking standards for refrigeration systems, air-conditioning units and heat pumps; and leakage checking standards for fire-protection systems etc) which were introduced by the Commission pursuant to the previous F-Gases Regulation (EC) No. 842 / 2006 shall remain in force and continue to apply unless and until repealed by delegated or further Implementing Acts adopted by the Commission in accordance with the F-Gases Regulation (EU) No. 517 / 2014 (the existing Implementing Acts are accessible from: http://ec.europa.eu/clima/policies/f-gas/legislation/documentation_en.htm).

1.3 On 19 March 2015, the UK Fluorinated Greenhouse Gases (F-Gases) Regulations 2015 (details at: <http://www.legislation.gov.uk/ukxi/2015/310/contents/made>) entered into force. The UK F-Gases Regulations 2015 revoke and replace the UK Fluorinated Greenhouse Gases Regulations 2009 which enforced the F-Gases Regulation (EC) No. 842 / 2006, so as to provide powers for authorised persons to enforce the F-Gases Regulation (EU) No. 517 / 2014. The UK F-Gases Regulations 2015 prescribe the competent authorities; enforcement powers; appointment and powers of authorised persons; offences and penalties for non-compliance with the UK Regulations and the EU F-Gases Regulation (see paragraph 1.7) and also designate certification and training bodies (see Section 2 paragraphs 2.28 to 2.31). The UK F-Gases Regulations 2015 cover all appropriate industrial operations - including offshore facilities engaged in oil and gas exploration / production, carbon capture and storage and gas unloading / storage activities.

1.4 The purpose of this guidance document is to set out the various requirements on Operators under the EU F-Gases Regulation that will be enforced offshore by the Offshore Oil & Gas Environment and Decommissioning Branch (OGED) of DECC’s Energy Development Unit (EDU) - see [Annex F](#) for the core aspects against which DECC’s offshore Inspectors will assess Operator compliance with the relevant regulatory obligations. Please note that, in relation to F-Gas legislation, DECC is the enforcement authority for offshore installations undertaking hydrocarbon-related activities (for example, oil and gas exploration / production, and gas and CO₂ unloading and storage operations). It is not the enforcement authority for offshore renewable energy facilities.



1.5 From an offshore perspective, DECC considers that the person on whom obligations will fall under the EU F-Gases Regulation will, in most cases, be the approved Operator (usually one of the holders of the relevant petroleum or gas or CO₂ storage licence). However, DECC recognises that in some cases another company (not one of the licensees) may be responsible for undertaking the day-to-day operation / management of an offshore facility on behalf of the approved Operator. This could be the owner of the facility; the duty holder of the facility; a company contracted to "operate" the facility; or a company contracted to undertake specific works on behalf of the "approved" Operator. Nevertheless, in such circumstances, the licensed Operator will need to make sure that sufficient systems and procedures, or where applicable contractual obligations, are in place to ensure adherence to the requirements of the EU F-Gases Regulation. **Accordingly, the terms "Operator" or "Operators" as used in this guidance document should also be considered as encompassing other undertakings - where applicable - such as service contractors. Therefore, where appropriate, references to "undertaking(s) (e.g. contractor(s))"; "other undertakings (e.g. contractors)" "contractors"; and "contractor personnel" are used in conjunction with the terms "Operator" or "Operators". This is particularly relevant for those aspects of the guidance that are principally concerned with:**

- ✚ the prevention of F-gas emissions;
- ✚ the installing / repairing / maintenance / servicing / decommissioning of F-gas containing equipment (including the addition and removal / recovery of F-gases);
- ✚ leakage checking;
- ✚ leakage detection systems;
- ✚ the maintenance of records;
- ✚ the control of the use of F-gases; and
- ✚ training and certification.

1.6 In this context, where a Mobile Drilling Unit (MoDU) is supplied under contract to assist offshore activities, we would strongly recommend that the licensed Operator liaises closely with the contractor operating the MoDU in order to determine how the obligations of the EU F-Gases Regulation are to be complied with e.g. the Operator of a MoDU providing the licensed Operator with copies of any procedures to be used to ensure compliance ahead of commencing activities and subsequently, any records that have been maintained during the period of operation relating to the functioning of any F-gas containing equipment on the facility plus an inventory of equipment / associated levels of F-gases contained therein (e.g. to enable the reporting of emissions to the Environmental Emissions Monitoring System (EEMS) - see Section 2 paragraph 2.26 item (i)). It is also the case that a 'Consent to Locate (CTL)' from DECC would be required where a MoDU was planning to operate specifically in UK territorial waters (excluding those surrounding Scotland (i.e. Scottish territorial waters) which are not subject to the CTL requirement) or the United Kingdom Continental Shelf (UKCS) and application for CTL would be a useful trigger point for addressing the F-Gas compliance requirements. Further details on the CTL process can be accessed from: <https://www.gov.uk/oil-and-gas-offshore-environmental-legislation#the-energy-act-2008-part-4a-consent-to-locate>.



1.7 The EU F-Gases Regulation and the UK F-Gases Regulations 2015 have many provisions to control uses and emissions of F-gases, however, not all are immediately relevant to the offshore industry, and this guidance document only concerns those provisions which it is considered are likely to affect it. It also only provides guidance on the equipment most likely to form part of offshore facilities. Therefore, this guidance is not intended to be exhaustive as regards compliance with the entirety of the EU F-Gases Regulation or the UK F-Gases Regulations 2015, but is only intended to assist Operators in complying with provisions which are relevant to them. Details on the enforcement powers, specific offences and penalties (for non-compliance with the requirements of the UK Regulations and the EU F-Gases Regulation) are contained in Parts 4 (Enforcement) and 5 (Offences and penalties) to the UK F-Gases Regulations 2015.

1.8 Note that under Regulation 1 of the UK F-Gases Regulations 2015, the Regulations only apply to Northern Ireland offshore facilities insofar as they deal with import and export controls and trade with any place outside the United Kingdom. However, the Department of the Environment in Northern Ireland (DOE-NI) is planning to introduce legislation for enforcing all the other provisions of the EU F-Gases Regulation in respect to relevant industrial operations throughout Northern Ireland - including its territorial waters. In this regard, on 6 July 2015 the DOE-NI launched a consultation on the proposed F-Gases Regulations (Northern Ireland) 2015 - the consultation is accessible from:

http://www.doeni.gov.uk/index/protect_the_environment/local_environmental_issues/air_and_environmental_quality/f_gases2.htm and the closing date for responses is 31 August 2015. The Regulations will appropriately cover any offshore facilities (using F-gas containing equipment) which undertake within Northern Ireland (NI) territorial waters operations associated with oil and gas exploration / production, carbon capture and storage and gas unloading / storage. Therefore should such offshore facilities be located in NI territorial waters, then the enforcement arrangements under the impending legislation for those facilities will be the same as that which applied under the Northern Ireland F-gases regulatory regime which enforced the provisions of the previous F-Gases Regulation (EC) No. 842 / 2006.

2.0 Regulatory requirements relevant to offshore Operators under various Articles of the EU F-Gases Regulation

2.1 The Guidance Sheet at [Annex A](#) summarises the relevant requirements on Operators to ensure compliance with the EU F-Gases Regulation. The core obligations on Operators are explained in paragraphs 2.3 to 2.26 - covering Articles 3, 4, 5, 6, 8, 12, 13 and 20, with suitable cross-references between these and other Articles (see paragraph 2.2) being included as appropriate.

2.2 As indicated in paragraph 2.27 there are:

- additional obligations within Article 10 and Article 11 as well as factors linked to Article 15 which will have some ramifications for Operators - these are described in paragraphs 2.28 to 2.35; and
- another reporting requirement relating to non-compliance - as described in paragraph 2.36.

2.3 **Prevention of F-Gas emissions (Article 3):** Under **Article 3(1)** and **Article 3(2)**:

- Intentional (operational) emissions of F-gases are prohibited where emissions are not technically necessary for the intended use of the equipment.



- Operators of equipment containing F-gases are required to take precautions to prevent unintentional (accidental) emissions of those gases. Operators will also need to take all measures which are technically / economically feasible to minimise leakages of F-gases.

All unintentional (accidental) emissions are deemed by DECC to be 'leakages' as are all intentional (operational) emissions where those emissions are not deemed technically necessary for the intended use of equipment. Please note that even where nominal emissions are considered a typical operational characteristic of equipment, DECC will not treat such emissions as "technically necessary" where Operators can take feasible measures to reduce these emissions. For instance, through applying the requirements on leakage checking, Operators might be able to identify opportunities to further minimise operational emissions.

However, DECC does recognise that such additional reductions will not always be technically viable / achievable especially where emissions of F-gases from particular types of equipment are already low (e.g. due to effective maintenance programmes being in place). Where emissions cannot be reduced any further, such emissions will be deemed "technically necessary". Please note that whilst Operators are not required to reduce intentional (operational) emissions that are technically necessary (i.e. on the basis that extra 'reduction measures' would be genuinely unfeasible), other regulatory obligations which relate to 'emissions', such as the requirements to report emissions, will apply to technically necessary emissions.

Please see paragraph 2.26 item (i) for further information on the distinction between intentional (operational) and unintentional (accidental) emissions.

2.4 **Under Article 3(3)**, where Operators detect a leakage of F-gases from equipment they will be required to ensure that the equipment is repaired without undue delay. Where F-gas containing equipment is subject to leak checks (see paragraphs 2.6 to 2.9) and a leak in equipment has subsequently been repaired, Operators must ensure that the equipment is checked by certified (qualified) personnel (see paragraph 2.5) within one month after the repair to verify that the repair has been effective.

2.5 In accordance with **Article 3(4)**:

- ❖ Personnel carrying out the installation, servicing, maintenance, repair or decommissioning of relevant F-gas containing equipment must be certified (qualified) in accordance with the pertinent obligations of Article 10 (see paragraphs 2.28 to 2.31) and must take precautionary measures to prevent leakages of F-gases.
- ❖ Personnel carrying out leakage checking and the recovery of F-gases (see paragraphs 2.21 to 2.23) in relation to relevant F-gas containing equipment must be certified (qualified) in line with the germane requirements of Article 10 and must take precautionary measures to prevent F-gas leakages.
- ❖ Undertakings (e.g. contractors) deploying personnel to carry out the installation, servicing and maintenance of relevant F-gas containing equipment on behalf of an offshore Operator must hold a 'company certificate' (i.e. confirming that they employ suitably qualified personnel) in accordance with the pertinent requirements of Article 10 and must take precautionary measures to prevent F-gas leakages.



[Note: Following deliberations between Defra and the Commission, it has been determined that where companies (e.g. offshore Operators) use their own suitably certified (qualified) 'in-house technicians' to install, service, maintain, repair or decommission relevant F-gas containing equipment at their specified places of business (e.g. on specific offshore facilities) then they do not need to obtain a 'company certificate'.]

2.6 ***Leak checks (Article 4):*** Under **Article 4(2)** and **Article 4(3)**, Operators of the equipment listed below which contains F-gases in quantities of 5 tonnes of CO₂ equivalent (CO₂/e) or more that are not contained in foams:

- stationary refrigeration equipment;
- stationary air-conditioning equipment;
- stationary heat pumps;
- stationary fire protection equipment; and
- electrical switchgear (but see derogations for electrical switchgear in the 'second bullet point' of paragraph 2.8),

need to ensure that it is checked for leaks as per the following frequencies:

(a) for equipment that contains F-gases in quantities of 5 tonnes of CO₂/e or more, but less than 50 tonnes of CO₂/e: at least every 12 months - or where a leakage detection system is installed at least every 24 months;

(b) for equipment that contains F-gases in quantities of 50 tonnes of CO₂/e or more, but less than 500 tonnes of CO₂/e: at least every 6 months - or where a leakage detection system is installed at least every 12 months; and

(c) for equipment that contains F-gases in quantities of 500 tonnes of CO₂/e or more: at least every 3 months - or where a leakage detection system is installed at least every 6 months.

Leakage checks must be performed by certified (qualified) personnel, except in the case of electrical switchgear in accordance with Article 4(2) and Article 10.

The calculation method and Global Warming Potentials (GWPs) to be used for converting F-gas emissions to 'tonnes of CO₂/e' are provided at [Annex B](#). Operators may also wish to use the European Commission's 'GWP-metric tonne conversion tool (calculator)' which is accessible from: http://ec.europa.eu/clima/policies/f-gas/documentation_en.htm.

Equipment must also be checked in-line with EU Regulations on leakage checking standards - see details at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1516>); and <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1497>).



2.7 The leakage checking obligations of Article 4 for fire protection equipment will be considered as being fulfilled provided these conditions are met:

- (i) the existing leakage checking regime meets ISO 14520 or EN 15004 standards; and
- (ii) the fire protection equipment is checked for leaks as often as is required by Article 4(3).

2.8 In line with **Article 4(1)**:

- ✚ Hermetically sealed equipment that contains F-gases in quantities of less than 10 tonnes of CO₂e will not be subject to leak checks, provided the equipment is labelled as 'hermetically sealed'.
- ✚ Electrical switchgear will not be subject to leak checks provided it complies with one of the following conditions:
 - (a) it has a tested leakage rate of less than 0.1% per year as set out in the technical specification of the manufacturer and is labelled accordingly;
 - (b) it is equipped with a pressure or density monitoring device; or
 - (c) it contains less than 6 kgs of F-gases.

2.9 By way of derogation from the requirements described in paragraph 2.6, until 31 December 2016, equipment that contains less than 3 kgs of F-gases or hermetically sealed equipment which is labelled accordingly and contains less than 6 kgs of F-gases will not be subject to leak checks (i.e. the leakage checking requirements will apply from 1 January 2017).

2.10 **Specific aspects relating to leakage checks / tests:** Leakage tests can invariably involve the use of 'direct' measuring techniques such as:

- A hand held electronic gas detector.
- UV sensitive detection fluid or dye in the refrigerant.
- Soap suds or proprietary bubble solutions.

2.11 It is best (where possible) to use a combination of techniques e.g. an electronic detector to test a wide area and soap suds to identify the exact location of a leak.

2.12 In certain situations it will be more appropriate to use 'indirect' leak measurement methods - basically involving the observation of factors such as temperatures and pressures in equipment (e.g. refrigeration systems) - to ascertain whether there has been a reduction in inventory of refrigerant. This can be useful if parts of the equipment are inaccessible (when a hand held leak detector may not be appropriate). If a leak is suspected, then it will often be necessary to use 'direct' measurement methods to identify the exact location of the leak. Indirect measuring methods can be valuable in cases where the leakage develops very slowly and where equipment is placed in a well ventilated environment making it difficult to detect F-gases escaping from the system into the air.



2.13 **Leakage detection systems (Article 5)**: Under **Article 5(1)**, Operators of the equipment listed below which contains F-gases in quantities of 500 tonnes of CO₂/e or more:

- stationary refrigeration equipment;
- stationary air-conditioning equipment;
- stationary heat pumps; and
- stationary fire protection equipment,

need to ensure that the equipment is provided with a leakage detection system which alerts the Operator of any leakages. In line with **Article 5(3)**, Operators must ensure that leakage detection systems (LDS) installed on the equipment identified above are checked at least once every 12 months to ensure their proper functioning.

2.14 Under **Article 5(2)**, Operators of electrical switchgear containing F-gases in quantities of 500 tonnes of CO₂/e or more and which is installed from 1 January 2017 must ensure it is provided with a leakage detection system that alerts the Operator of any leakages. In accordance with **Article 5(4)**, Operators are to ensure that LDS installed on electrical switchgear are checked at least once every 6 years to ensure their proper functioning.

2.15 **Specific aspects relating to leakage detection systems**: Two types of leakage detection system can be considered:

- **A direct system**, which uses electronic sensors to detect the presence of leakages in areas adjacent to equipment.
- **An indirect system**, which interprets measurements within equipment to predict a leak. This might include liquid level in a receiver vessel combined with relevant temperatures and pressures.

2.16 There are advantages and disadvantages to both types of system as explained below:

- A direct system gives a 'robust' indication of a leak if the sensor is located in the right place - but it is not effective if a leak is outdoors or a long way from a sensor. A direct system often helps to locate the general vicinity of a leak.
- An indirect system requires 'built-in intelligence' as it is quite difficult to interpret varying conditions of liquid level and pressures / temperatures within equipment, which can vary widely even if no leak has occurred. However where, for example, a refrigeration system has components in several locations or has components in exposed outdoor locations then an indirect system might be the only practical option for detecting leakages.

2.17 It will therefore be necessary for Operators to take into account the specific circumstances of equipment when selecting the best approach for detecting leakages.



2.18 **Record-keeping (Article 6)**: Under **Article 6(1)**, Operators of relevant equipment (which is required to be checked for leaks pursuant to Article 4) must establish and maintain records for each piece of equipment specifying the information detailed below:

- (i) the quantity and type of F-gases installed in operational equipment (this should not include F-gases contained in stock cylinders which are used for maintenance / servicing e.g. topping-up appliances);
- (ii) the quantities of F-gases added during installation, maintenance or servicing or due to leakage;
- (iii) whether the quantities of installed F-gases have been recycled or reclaimed, including the name and address of the recycling or reclamation facility and, where applicable, the certificate number;
- (iv) the quantity of F-gases recovered;
- (v) the identity of the undertaking (e.g. contractor) which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;
- (vi) the dates and results of the checks carried out in line with the requirements of Article 4; and
- (vii) if the equipment was decommissioned, the measures taken to recover and dispose of the F-gases.

2.19 For manned installations records should be retained offshore. Where installations are unmanned, records should be kept at the Operator's onshore premises. For these purposes, Operators may wish to use the template at [Annex C](#) for maintaining the required records (also note additional record-keeping requirements in paragraph 2.26 items (i) and (ii) concerning intentional (operational) and unintentional (accidental) emissions of F-gases). Operators must maintain the required records for each calendar year i.e. 1 January to 31 December.

2.20 Under **Article 6(2)**:

- (a) Operators must keep the records outlined in paragraph 2.18 for at least five years.
- (b) The records are to be made available where requested by DECC or the Commission (e.g. for checking compliance).

2.21 **Recovery (Article 8)**: Under **Article 8(1)**, Operators of stationary equipment that contains F-gases not contained in foams must ensure that the recovery of those gases is carried out by personnel that hold the relevant certificates (qualifications) provided for by Article 10, so that those gases are recycled, reclaimed or destroyed.

2.22 The obligation in Article 8(1) applies to Operators of any of the following equipment:



- (i) the cooling circuits of stationary refrigeration, stationary air-conditioning and stationary heat pump equipment;
- (ii) stationary equipment that contains F-gas-based solvents;
- (iii) stationary fire protection equipment; and
- (iv) stationary electrical switchgear.

2.23 In line with **Article 8(2)**, Operators using an F-gas container immediately prior to its disposal will need to arrange for the recovery of residual gases to make sure they are recycled, reclaimed or destroyed.

2.24 **Labelling and equipment information (Article 12)**: The responsibility for ensuring that all F-gas containing equipment is suitably labelled in line with the provisions of Article 12 will largely rest with manufacturers which place equipment on the market. Nonetheless, Operators should at least ensure that:

- ❖ any newly purchased pre-charged equipment is appropriately labelled; and
- ❖ labels are updated for any equipment which is filled or topped-up with F-gases during installation on site.

Further details on labelling requirements under Commission Regulation (EC) No 1494 / 2007 can be accessed at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1494>

2.25 **Control of use (Article 13)**: Under **Article 13(3)**:

(i) From 1 January 2020, the use by Operators of F-gases with a GWP of 2,500 or more to service or maintain refrigeration equipment with a charge size of 40 tonnes of CO₂/e or more will be prohibited (although see derogation factors outlined in item (ii) below). It will still be permissible to continue operating such equipment after the specified date, but it will not be possible to top-up the equipment with virgin HFCs. Consequently, Operators of existing refrigeration equipment affected by the 'Service Ban' have three main options:

- (a) Replace the existing refrigeration equipment with new equipment using HFCs with a lower GWP or non-HFC alternatives. In this regard, where Operators are planning to purchase new refrigeration equipment in the near future, they should take into account the fact that the 'Service Ban' will - from 2020 - affect systems using HFCs with a GWP \geq 2,500. Thus, to avoid problems in the years ahead, Operators should ideally only select new refrigeration equipment which contains F-gases with GWPs < 2,500 or non-HFC alternatives with immediate effect.
- (b) Retrofit existing refrigeration equipment using lower GWP alternatives.

If Operators are considering purchasing new 'non-HFC' refrigeration equipment or retrofitting existing refrigeration equipment with lower GWP alternatives, then they would find it helpful to read the Defra / Gluckman



Consulting Information Sheets on 'Flammability Issues' and 'Low GWP Alternatives' which are accessible via the links provided in Section 3.

(c) Use reclaimed or recycled HFCs for existing refrigeration equipment - as per part (b) of item (ii) below.

(ii) The prohibition referred to in item (i) above will not apply to:

(a) equipment intended for applications designed to cool products to temperatures below - 50°C; and

(b) the following categories of F-gases until 1 January 2030:

- Reclaimed F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment.
- Recycled F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment provided they have been recovered from such equipment. Such recycled gases may only be used by the undertaking which carried out their recovery as part of maintenance or servicing or the undertaking for which the recovery was carried out as part of maintenance or servicing.

It should be noted that the 'Service Ban' referred to in item (i) above does not apply to air-conditioning equipment, fire-protection equipment, electrical switchgear or heat pumps.

2.26 ***Collection of data on F-gas emissions (Article 20)***: The F-Gases Regulation (EU) No. 517 / 2014 specifically targets both intentional (operational) and unintentional (accidental) emissions of F-gases. Therefore, to enable DECC to fulfil its obligations under **Article 20**, Operators will be required to:

(i) Monitor and annually report (by 31 March each year (or as soon as possible thereafter) for the previous calendar year) to the Environmental Emissions Monitoring System (EEMS) a total quantity in kgs of intentional (operational) plus any unintentional (accidental) emissions of F-gases (e.g. HFCs) from relevant equipment (note extra reporting obligation for unintentional (accidental) F-gas emissions in item (ii) below). This EEMS-related reporting obligation reflects the fact that the EU F-Gases Regulation covers both intentional and unintentional F-gas emissions. The data supplied will allow DECC to monitor over time the extent of emissions of F-gases from equipment. A record of these emissions should also be maintained as indicated in Section 9 of the [Annex C](#) form. To assist this process, it may be useful to clarify what intentional and unintentional emissions would traditionally constitute:

- ❑ **Intentional (operational) emissions of F-gases:** These are classified as gradual emissions (which can, depending on the size of the equipment, be low / nominal emissions) that occur during the normal operation of equipment e.g. there are many potential leak locations (especially on large systems) that have numerous joints, valves and compressors (along with other system connections). Where leakages are slow they can go unnoticed for long periods



and result in direct emissions of F-gases and poor equipment performance - often leading to wasted energy.

- ❑ **Unintentional (accidental) emissions of F-gases:** These are generally considered to be unexpected leakages that occur during the normal operation of equipment - for example, where some or all F-gases (sometimes in significant quantities) are lost due to a major system failure such as a refrigerant pipe burst, or where substances are lost during the maintenance of equipment involving the addition / removal of F-gases.

As Operators are aware, the EEMS reporting module for F-gases also includes an 'On facility' module (which is distinct from the 'Emissions' module). Therefore, when submitting EEMS returns on emissions (as indicated above), Operators should also ideally utilise the 'On facility' module to report a total figure which encompasses the quantities of F-gases contained in equipment plus those held in stock cylinders.

Some years ago it was the case that during the maintenance / servicing of equipment any F-gases were simply vented to the atmosphere, however, it should be noted that this practice is now illegal.

(ii) Extra reporting obligation for unintentional (accidental) F-gas emissions: Under the broad provisions in Article 6(4) of the previous F-Gases Regulation (EC) No. 842 / 2006, Operators were required to separately report (via an Annex C form) any unintentional (accidental) emissions of F-gases where the total losses equated to 1,000 tonnes of CO₂e or more (*this scenario still applies in respect to any continued uses of ozone-depleting substances that are permitted under the Ozone Depleting Substances (ODS) Regulation (EC) No. 1005 / 2009 i.e. in connection with the reporting provisions under Articles 23(1) and 23(2).*)

Given that the F-Gases Regulation (EU) No. 517 / 2014 contains specific provisions pertaining to unintentional emissions of F-gases per se, Operators will now be required to additionally report any unintentional (accidental) emissions of F-gases to DECC's Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk) - via the form at **Annex D** - within 48 hours of it being established (e.g. during the course of scheduled maintenance) that such an incident had occurred. A record of these type of emissions should also be maintained as indicated in Section 11 of the Annex C form. However, if Operators are in any doubt as to whether certain emissions should be construed as being unintentional then it is suggested that they liaise with DECC first (see Contact in Section 5) before submitting the Annex D form (i.e. DECC may consider that the emissions in question should be classified as intentional rather than unintentional).

2.27 Additional Obligations: There are extra obligations in Articles 10 and 11 as well as factors linked to Article 15 which will have some implications for offshore Operators plus another reporting requirement relating to non-compliance (which is a standard feature of DECC's offshore environmental regulatory regime) and these are explained in paragraphs 2.28 to 2.36.

2.28 Training and certification (Article 10): Under **Article 10(5):**

- The minimum certification / training attestation requirements are those laid down in Commission Regulations (EC) No. 303 / 2008 to (EC) No. 307 / 2008 (accessible from:



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http://ec.europa.eu/clima/policies/f-gas/legislation/documentation_en.htm) which were issued pursuant to the previous F-Gases Regulation (EC) No. 842 / 2006. The Regulation(s) that is / are applicable depends on the type of equipment in use and the activity(ies) being carried out in relation to the equipment (note points raised in paragraph 2.30).

The minimum requirements referred to above specify for each type of relevant equipment the required practical skills and theoretical knowledge differentiating, where appropriate, between the different activities to be covered, as well as the conditions for mutual recognition of certificates and training attestations.

2.29 In accordance with **Article 10(7)**, existing certificates and training attestations issued pursuant to the F-Gases Regulation (EC) No. 842 / 2006 shall remain valid, in line with the conditions under which they were originally issued.

2.30 Where Operators employ 'in-house technicians' (as opposed to 'contractor personnel') to install, service and maintain F-gas containing equipment, then those Operators will need to ensure that their technicians are appropriately certified (qualified). In situations where Operators use undertakings (e.g. contractors) to install, service and maintain F-gas containing equipment then their personnel must also be certified (qualified) accordingly. In relation to installation, maintenance and servicing of stationary refrigeration equipment; stationary air-conditioning equipment; stationary heat pumps; and stationary fire protection equipment; the contractor must also be certified, as set out in Commission Regulations (EC) Nos. 303 / 2008 and 304 / 2008. (The requirements for certification and attestations are included in the UK F-Gases Regulations 2015, in addition to Commission Regulations (EC) No. 303 / 2008 to (EC) No. 307 / 2008).

2.31 Whilst the obligations of Article 10 are outside DECC's regulatory remit and the onus for compliance predominantly resides with companies in the service / maintenance sector, **it is nevertheless the case that Operators will need to ensure that:**

(a) undertakings / companies which are contracted to install, service and maintain F-gas containing equipment on their offshore facilities hold the necessary 'company certificates' in line with the requirements of the EU F-Gases Regulation; and

(b) all personnel (whether 'in house technicians' or 'contractor personnel') who work with F-gas containing equipment on their offshore facilities are certified (qualified) in accordance with the provisions of the EU F-Gases Regulation.

In this regard, DECC plans to work closely with the other Competent Authorities (e.g. the Environment Agency and the Scottish Environment Protection Agency) to ensure that the certification / qualification requirements of Article 10 are effectively enforced. For instance, should any non-compliance with the Article 10 provisions of the F-Gases Regulation (EU) No. 517 / 2014 be discovered by DECC's Inspectors during visits to offshore facilities to check Operator compliance with, amongst other things, the F-gas legislative regime, then DECC will liaise with the relevant Competent Authorities to determine how such non-compliance should be formally addressed i.e. through contact with an offshore Operator's and / or another undertaking's (e.g. contractor's) onshore HQ.

2.32 **Restrictions on the placing on the market (Article 11):** Under **Article 11(1)**, the placing on the market of equipment listed in Annex III will be prohibited from the date specified in that Annex,



differentiating, where applicable, based on the type or GWP of the F-gases contained in such equipment. Some of the core types of equipment listed in Annex III to the EU F-Gases Regulation are as follows (although Operators are advised to check Annex III to determine whether any of the other equipment restrictions might apply to equipment deployed on offshore facilities):

Placing on the Market Prohibitions referred to in Article 11(1)

Type of Products / Equipment		Prohibition Dates
Fire Protection Equipment	that contain PFCs	4 July 2007
	that contain HFC 23	1 January 2016
Domestic refrigerators and freezers that contain HFCs with a GWP of 150 or more		1 January 2015
Refrigerators and freezers for commercial use (hermetically sealed equipment)	that contain HFCs with a GWP of 2,500 or more	1 January 2020
	that contain HFCs with a GWP of 150 or more	1 January 2022
Stationary refrigeration equipment, that contains, or whose functioning relies upon, HFCs with a GWP of 2,500 or more except equipment intended for applications designed to cool products to temperatures below - 50°C		1 January 2020
Multipack centralised refrigeration systems for commercial use with a rated capacity of 40 kW or more that contain, or whose functioning relies upon, F-gases with a GWP of 150 or more, except in the primary refrigerant circuit of cascade systems where F-gases with a GWP of less than 1,500 may be used		1 January 2022
Movable room air-conditioning equipment (hermetically sealed equipment which is movable between rooms by the end user) that contain HFCs with a GWP of 150 or more		1 January 2020
Single split air-conditioning systems containing less than 3 kgs of F-gases, that contain, or whose functioning relies upon, F-gases with a GWP of 750 or more		1 January 2025
Foams that contain HFCs with a GWP of 150 or more except when required to meet national safety standards	Extruded polystyrene (XPS)	1 January 2020
	Other foams (including polyurethane foam)	1 January 2023

2.33 In accordance with **Article 11(4)**:

- For the purposes of carrying out the installation, servicing, maintenance or repair of equipment that contains F-gases or whose functioning relies upon those gases for which certification or attestation is required under the relevant provisions of Article 10, F-gases must only be sold to and purchased by:
 - ❖ undertakings (e.g. contractors on an offshore Operator’s behalf) which hold the relevant ‘company certificates’ or attestations in accordance with the pertinent obligations of Article 10; or
 - ❖ Operators that use personnel (‘in-house technicians’ or ‘contractors’) who hold a certificate (qualification) or training attestation in line with the appropriate requirements of Article 10.

2.34 To meet the requirements of **Article 11(5)**, where Operators purchase non-hermetically sealed equipment as the end-users they must provide to the supplier a letter stating that the equipment will be installed by either:



- personnel who are certified (qualified) in accordance with the relevant provisions of Article 10; or
- personnel from a contractor which holds a ‘company certificate’ in line with the pertinent obligations of Article 10.

2.35 ***Reduction of the quantity of HFCs placed on the market (Article 15):*** When planning to purchase new F-gas containing equipment, Operators should contemplate the HFC phase-down as described in Annex V (see table below for details) which is referred to in the provisions of Article 15 of the EU F-Gases Regulation. The phase-down will reduce the quantity of HFCs that can be sold in the EU - by 2030 there will be almost an 80% cut in HFC supply. Equipment bought now will still be operating when deep cuts in HFC supply are in force. Irrespective of the prohibitions explained in paragraphs 2.25 and 2.32, it would make sense if Operators strive to purchase new equipment which uses F-gases with the lowest practical GWP or ‘non-HFC’ alternatives to minimise the future impact of the phase-down.

HFC Phase-Down

Years	Percentage to calculate the maximum quantity of HFCs to be placed on the market and corresponding quotas
2015	100 %
2016 - 2017	93 %
2018 - 2020	63 %
2021 - 2023	45 %
2024 - 2026	31 %
2027 - 2029	24 %
2030	21 %

2.36 ***Reporting non-compliance:*** If any Operators have breached, or believe that they might be at risk (for whatever reason) of breaching, the obligations set out in this guidance document then they should notify any potential, or actual instances of, regulatory non-compliance to DECC’s Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk) using the form at [Annex E](#) - so that an assessment can be made of the circumstances which led, or might lead, to an incidence of non-compliance. Notification should take place as soon as is reasonably practicable. Operators should address any queries on the policy aspects described in this document to the DECC Contact mentioned in Section 5.

3.0 Other sources for guidance

3.1 Defra / Gluckman Consulting have published detailed Information Sheets on the obligations of the F-Gases Regulation (EU) No. 517 / 2014 which are available from: <http://www.gluckmanconsulting.com/f-gas-information-sheets/> (abbreviated versions are also accessible at: <https://www.gov.uk/government/collections/eu-f-gas-regulation-guidance-for-users-producers-and-traders>). Operators would find it extremely useful to look at the Information Sheets in conjunction with this guidance document.



4.0 Future developments

4.1 This guidance document will be updated to reflect:

(a) any future national legislation (i.e. from the Department of the Environment in Northern Ireland) for enforcing the F-Gases Regulation (EU) No. 517 / 2014; and

(b) any Commission proposals for further revising the EU F-gases regime e.g. as a result of delegated acts that are adopted following reviews by the Commission of: (i) the Articles and Annexes in the F-Gases Regulation (EU) No. 517 / 2014; and (ii) the Implementing Acts that were issued pursuant to the F-Gases Regulation (EC) No. 842 / 2006.

Please note that there may be delays between legislative updates and updates to the guidance.

5.0 DECC - EDU / OGED contact

5.1 For enquires on this guidance document please contact: David Foskett - e-mail: david.foskett@decc.gsi.gov.uk ; Tel: 0300 068 6063.

Department of Energy and Climate Change (DECC)
Energy Development Unit (EDU)
Offshore Oil & Gas Environment and Decommissioning Branch (OGED)

Date: July 2015



ANNEX A

THE F-GASES REGULATION (EU) No. 517 / 2014

GUIDANCE SHEET FOR THE OFFSHORE HYDROCARBON INDUSTRY

EU F-Gases Regulation requirements and Operators' obligations

Provisions	(A) Regulatory requirements relevant to offshore Operators under various Articles of the EU F-Gases Regulation
Prevention of F-Gas emissions (Article 3)	<p>Operators need to take all precautionary measures which are technically and economically feasible to prevent or minimise F-gas leakages. To this end:</p> <p>(i) Intentional (operational) emissions of F-gases (i.e. Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF6)) are prohibited where emissions are not technically necessary for the intended use of equipment (see related issue in item (iii) below).</p> <p>(ii) Precautions are to be taken to prevent unintentional (accidental) emissions of F-gases.</p> <p>(iii) The requirement to prevent and minimise leakages also applies to intentional (operational) emissions that are not deemed technically necessary for the intended use of equipment. Whilst Operators are not required to reduce intentional (operational) emissions that are technically necessary (i.e. on the basis that extra 'reduction measures' would be genuinely unfeasible), other regulatory obligations which relate to 'emissions', such as the requirements to report emissions, will apply to technically necessary emissions. See paragraph 2.3 (above) for more details.</p> <p>(iv) Where a leakage of F-gases from equipment is detected the equipment must be repaired without undue delay and the equipment checked within one month of the repair to verify it has been effective. In this context: (a) personnel carrying out the installation, servicing, maintenance, repair or decommissioning of relevant F-gas containing equipment must be certified (qualified) in accordance with Article 10 (see 'Training and certification (Article 10)' heading under Part (B) 'Additional Obligations' further down below); (b) personnel carrying out leakage checking and the recovery of F-gases in relation to relevant F-gas containing equipment must be certified (qualified) in line with the requirements of Article 10; and (c) undertakings (e.g. contractors) deploying personnel to carry out the installation, servicing and maintenance of relevant F-gas containing equipment on behalf of an offshore Operator must hold a 'company certificate' (i.e. confirming that they employ suitably qualified personnel) in accordance with the pertinent requirements of Article 10.</p> <p><i>[Note the record-keeping / reporting requirements in relation to intentional (operational) and unintentional (accidental) emissions of F-gases which are described under the 'Collection of data on F-gas emissions (Article 20)' heading further down below.]</i></p>
Leak checks (Article 4)	<p>Operators of stationary refrigeration equipment; stationary air-conditioning equipment; stationary heat pumps; stationary fire protection equipment; and electrical switchgear which contain F-gases in quantities of 5 tonnes of CO₂/e or more that are not contained in foams must ensure it is checked for leaks as per the frequencies set out below:</p>



F-gas levels	Frequency of leak checks
5 tonnes of CO ₂ /e or more, but < 50 tonnes of CO ₂ /e	At least every 12 months If a leakage detection system is installed leak checks can be every 24 months.
50 tonnes of CO ₂ /e or more, but < 500 tonnes of CO ₂ /e	At least every 6 months If a leakage detection system is installed leak checks can be every 12 months.
500 tonnes of CO ₂ /e or more	At least every 3 months If a leakage detection system is installed leak checks can be every six months.
Leakage checks must be performed by certified (qualified) personnel, except in the case of electrical switchgear.	
Equipment must be checked in-line with EU Regulations on leakage checking standards - see details at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1516); and http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1497).	
<p>The leakage checking obligations for fire protection equipment will be considered as being fulfilled where:</p> <ul style="list-style-type: none"> ➤ the existing leakage checking regime meets ISO 14520 or EN 15004 standards; and ➤ the fire protection equipment is checked for leaks as often as the frequencies outlined in the table above. <p>Derogations from the leakage checking requirements of Article 4 are:</p> <ul style="list-style-type: none"> ✚ Hermetically sealed equipment that contains F-gases in quantities of less than 10 tonnes of CO₂/e will not be subject to leak checks, provided the equipment is labelled as hermetically sealed. ✚ Electrical switchgear will not be subject to leak checks provided it complies with one of the following conditions: <ul style="list-style-type: none"> (a) it has a tested leakage rate of less than 0.1% per year as set out in the technical specification of the manufacturer and is labelled accordingly; (b) it is equipped with a pressure or density monitoring device; or (c) it contains less than 6 kgs of F-gases. ✚ Until 31 December 2016, equipment containing less than 3 kgs of F-gases or hermetically sealed equipment which is labelled accordingly and contains less than 6 kgs of F-gases will not be subject to leak checks. 	
Leakage detection systems (Article 5)	<p>(i) Operators of stationary refrigeration equipment; stationary air-conditioning equipment; stationary heat pumps; and stationary fire protection equipment which contains F-gases in quantities of 500 tonnes of CO₂/e or more need to:</p> <ul style="list-style-type: none"> ▪ ensure the equipment is provided with a leakage detection system which alerts the Operator of any leakages; and



	<ul style="list-style-type: none">▪ ensure that the leakage detection systems (LDS) are checked at least once every 12 months to verify their proper functioning. <p>(ii) Operators of electrical switchgear containing F-gases in quantities of 500 tonnes of CO₂/e or more and which is installed from 1 January 2017 must:</p> <ul style="list-style-type: none">- ensure it is provided with a leakage detection system that alerts the Operator of any leakages; and- ensure that the LDS installed on electrical switchgear are checked at least once every 6 years to verify their proper functioning.
Record-keeping (Article 6)	<p>(i) Operators of relevant equipment must establish and maintain records for each piece of equipment specifying the following information:</p> <ul style="list-style-type: none">• the quantity and type of F-gases installed in operational equipment (this should not include F-gases contained in stock cylinders which are used for maintenance / servicing e.g. topping-up appliances);• the quantities of F-gases added during installation, maintenance or servicing or due to leakage;• whether the quantities of installed F-gases have been recycled or reclaimed, including the name and address of the recycling or reclamation facility and, where applicable, the certificate number;• the quantity of F-gases recovered;• the identity of the undertaking (e.g. contractor) which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;• the dates and results of the checks carried out in line with the requirements of Article 4; and• if the equipment was decommissioned, the measures taken to recover and dispose of the F-gases. <p>(ii) For manned installations records should be retained offshore. Where installations are unmanned, records should be kept at the Operator's onshore premises. The template at Annex C can be used by Operators for maintaining the required records.</p> <p style="text-align: center;"><i>[Note additional record-keeping / reporting requirements in relation to intentional (operational) and unintentional (accidental) emissions of F-gases which are described under the 'Collection of data on F-gas emissions (Article 20)' heading further below.]</i></p> <p>(iii) Operators must maintain records for each calendar year i.e. 1 January to 31 December.</p> <p>(iv) Operators must keep records for at least five years.</p>



	<p>(v) Records are to be made available where requested by DECC or the Commission (e.g. for checking compliance).</p>
Recovery (Article 8)	<p>(i) Operators of stationary equipment that contains F-gases not contained in foams must ensure that the recovery of those gases is carried out by personnel that hold the relevant certificates (qualifications) provided for by Article 10, so that those gases are recycled, reclaimed or destroyed. This obligation applies to Operators of any of the following equipment: (a) the cooling circuits of stationary refrigeration, stationary air-conditioning and stationary heat pump equipment; (b) stationary equipment that contains F-gas-based solvents; (c) stationary fire protection equipment; and (d) stationary electrical switchgear.</p> <p>(ii) Operators using an F-gas container immediately prior to its disposal must arrange for the recovery of any residual gases to make sure they are recycled, reclaimed or destroyed.</p>
Labelling (Article 12)	<p>(i) Operators should at least ensure that:</p> <ul style="list-style-type: none"> ❖ any newly purchased pre-charged equipment is appropriately labelled; and ❖ labels are updated for any equipment which is filled or topped-up with F-gases during installation on site. <p>(ii) Further details on labelling requirements under Commission Regulation (EC) No 1494 / 2007 can be accessed at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007R1494</p>
Control of use (Article 13)	<p>From 1 January 2020, the use by Operators of F-gases with a global warming potential (GWP) of 2,500 or more to service or maintain refrigeration equipment with a charge size of 40 tonnes of CO₂e or more will be prohibited. This prohibition will not apply to:</p> <ul style="list-style-type: none"> ▪ equipment intended for applications designed to cool products to temperatures below - 50°C; and ▪ the following categories of F-gases until 1 January 2030: <ul style="list-style-type: none"> ➤ Reclaimed F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment. ➤ Recycled F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment provided they have been recovered from such equipment. Such recycled gases may only be used by the undertaking which carried out their recovery as part of maintenance or servicing or the undertaking for which the recovery was carried out as part of maintenance or servicing. <p>The ‘Service Ban’ does not apply to air-conditioning equipment, fire-protection equipment, electrical switchgear or heat pumps.</p>
Collection of data on F-gas emissions (Article 20)	<p>(i) Operators will be required to:</p> <ul style="list-style-type: none"> • Monitor and annually report (by 31 March each year (or as soon as possible thereafter) for the previous calendar year) to the Environmental Emissions Monitoring System (EEMS) a total quantity in kgs of intentional (operational) plus any unintentional (accidental) emissions of F-gases from relevant equipment. A record of these emissions should also be maintained as indicated in Section 9 of the Annex C form.



	<ul style="list-style-type: none"> • Additionally report any unintentional (accidental) emissions of F-gases to DECC's Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk) - via the form at Annex D - within 48 hours of it being established (e.g. during the course of scheduled maintenance) that such an incident had occurred. A record of these type of emissions should also be maintained as indicated in Section 11 of the Annex C form. <p>DECC to be contacted prior to the submission of the Annex D form where an Operator has any doubts about whether certain emissions should be classified as unintentional.</p> <p>(ii) When submitting EEMS returns on emissions (as indicated in item (i) above), Operators should also ideally utilise the 'On facility' module to report a total figure which encompasses the quantities of F-gases contained in equipment plus those held in stock cylinders.</p>
<p>Provisions</p>	<p>(B) Additional Obligations</p>
<p>Training and certification (Article 10)</p>	<p>(i) Existing certificates and training attestations issued pursuant to the F-Gases Regulation (EC) No. 842 / 2006 shall remain valid, in line with the conditions under which they were originally issued. In this regard:</p> <ul style="list-style-type: none"> • The minimum certification / training attestation requirements are those laid down in Commission Regulations (EC) No. 303 / 2008 to (EC) No. 307 / 2008 (accessible from: http://ec.europa.eu/clima/policies/f-gas/legislation/documentation_en.htm). The Regulation(s) that is / are applicable depends on the type of equipment in use and the activity(ies) being carried out in relation to the equipment (note points raised in item (ii) below). <p>The minimum requirements referred to above specify for each type of relevant equipment the required practical skills and theoretical knowledge differentiating, where appropriate, between the different activities to be covered, as well as the conditions for mutual recognition of certificates and training attestations.</p> <p>(ii) Operators employing in-house technicians (as opposed to 'contractor personnel') to install, service and maintain F-gas containing equipment will need to ensure that their technicians are appropriately certified (qualified). Where Operators use undertakings (e.g. contractors) to install, service and maintain F-gas containing equipment their personnel must also be certified (qualified) accordingly. In relation to the installation, servicing and maintenance of stationary refrigeration equipment; stationary air-conditioning equipment; stationary heat pumps; and stationary fire protection equipment the contractor must also be certified, as set out in Commission Regulations (EC) Nos. 303 / 2008 and 304 / 2008. (The requirements for certification and attestations are included in the UK F-Gases Regulations 2015, in addition to Commission Regulations (EC) No. 303 / 2008 to (EC) No. 307 / 2008).</p> <p>(iii) Whilst the obligations of Article 10 are outside DECC's regulatory remit and the onus for compliance predominantly resides with companies in the service / maintenance sector, it is nevertheless the case that Operators will need to ensure that:</p> <p>(a) undertakings / companies which are contracted to install, service and maintain F-gas containing equipment on their offshore facilities hold the necessary 'company certificates' in line with the requirements of the EU F-Gases Regulation; and</p>



	<p>(b) all personnel (whether ‘in house technicians’ or ‘contractor personnel’) who work with F-gas containing equipment on their offshore facilities are certified (qualified) in accordance with the provisions of the EU F-Gases Regulation.</p>
<p>Restrictions on the placing on the market (Article 11)</p>	<p>(i) The placing on the market of equipment listed in Annex III will be prohibited from the date specified in that Annex (differentiating, where applicable, based on the type or GWP of the F-gases contained in such equipment).</p> <p>(ii) For the purposes of carrying out the installation, servicing, maintenance or repair of equipment that contains F-gases or whose functioning relies upon those gases for which certification or attestation is required under the relevant provisions of Article 10, F-gases must only be sold to and purchased by:</p> <ul style="list-style-type: none">❖ undertakings (e.g. contractors on an offshore Operator’s behalf) which hold the relevant ‘company certificates’ or attestations in accordance with the pertinent obligations of Article 10; or❖ Operators that use personnel (‘in-house technicians’ or ‘contractors’) who hold a certificate (qualification) or training attestation in line with the appropriate requirements of Article 10. <p>(iii) Where Operators purchase non-hermetically sealed equipment as the end-users they must provide to the supplier a letter stating that the equipment will be installed by either:</p> <ul style="list-style-type: none">• personnel who are certified (qualified) in accordance with the relevant provisions of Article 10; or• personnel from a contractor which holds a ‘company certificate’ in line with the pertinent obligations of Article 10.
<p>Reporting of Non-Compliance</p>	<p>Any potential, or actual instances of, regulatory non-compliance should be reported by Operators to DECC’s Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk) using the form at Annex E. Notification should take place as soon as is reasonably practicable.</p>



ANNEX B

THE F-GASES REGULATION (EU) No. 517 / 2014

CALCULATION METHOD AND GLOBAL WARMING POTENTIALS (GWPs) TO BE USED FOR CONVERTING F-GAS EMISSIONS TO 'TONNES OF CO2 EQUIVALENT'

Calculation method: Quantity of F-gases emitted multiplied by the GWP = CO2 equivalent

Example: If 2 tonnes (2,000 kgs) of HFC 134a (which has a GWP of 1430) was emitted then this would be the equivalent of 2,860 tonnes of CO2.

GLOBAL WARMING POTENTIALS (GWPs)

Note: Vast majority of the GWP values are based on the Fourth Assessment Report adopted by the Intergovernmental Panel on Climate Change.

Section A - Hydrofluorocarbons (HFCs)

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
Pure HFCs			
HFC 23	CHF ₃	0.0	14800
HFC 32	CH ₂ F ₂	0.0	675
HFC 41	CH ₃ F	0.0	92
HFC 43-10 mee	CF ₃ CHFCHFCF ₂ CF ₃	0.0	1640
HFC 125	CHF ₂ CF ₃	0.0	3500
HFC 134	CHF ₂ CHF ₂	0.0	1100
HFC 134a	CH ₂ FCF ₃	0.0	1430
HFC 143	CH ₂ FCHF ₂	0.0	353
HFC 143a	CH ₃ CF ₃	0.0	4470
HFC 152	CH ₂ FCH ₂ F	0.0	53
HFC 152a	CH ₃ CHF ₂	0.0	124
HFC 161	CH ₃ CH ₂ F	0.0	12
HFC 227ea	CF ₃ CHF ₂ CF ₃	0.0	3220
HFC 236cb	CH ₂ FCF ₂ CF ₃	0.0	1340
HFC 236ea	CHF ₂ CHFCF ₃	0.0	1370
HFC 236fa	CF ₃ CH ₂ CF ₃	0.0	9810
HFC 245ca	CH ₂ FCF ₂ CHF ₂	0.0	693
HFC 245fa	CHF ₂ CH ₂ CF ₃	0.0	1030
HFC 365mfc	CF ₃ CH ₂ CF ₂ CH ₃	0.0	794

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
Unsaturated HFC(HCFC)s			
HFC 1234yf	CF ₃ CF=CH ₂	0.0	4 ^{Fn 2}
HFC 1234ze	trans - CHF=CHCF ₃	0.0	7 ^{Fn 2}
HFC 1336mzz	CF ₃ CH=CHCF ₃	0.0	9
HCFC 1233zd	C ₃ H ₂ ClF ₃	0.0	4.5
HCFC-1233xf	C ₃ H ₂ ClF ₃	0.0	1 ^{Fn 3}



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Fluid Name / Number	Constituents of Blend	ODP	100 Year GWP
HFC Blends			
HFC 404A	125/134a/143a	0.0	3922
HFC 407A	32/125/134a	0.0	2107
HFC 407B	32/125/134a	0.0	2804
HFC 407C	32/125/134a	0.0	1774
HFC 407D	32/125/134a	0.0	1627
HFC 407F	32/125/134a	0.0	1825
HFC 410A	32/125	0.0	2088
HFC 410B	32/125	0.0	2229
HFC 413A	134a / PFC 218 / R 600a	0.0	2053
HFC 417A (Isceon 59)	125 / 134a / R 600	0.0	2346
HFC 422A	125 / 134a / R 600a	0.0	3143
HFC 422D	125 / 134a / R 600a	0.0	2729
HFC 423A	134a / 227ea / R 600a	0.0	2280
HFC 424A	125 / 134a / R 600 / R 601a	0.0	2440
HFC 426A	125 / 134a / R 600 / R 600a	0.0	1508
HFC 427A	32 / 125 / 134a / 143a	0.0	2138
HFC 428A	125 / 143a / R 290 / R 600a	0.0	3607
HFC 434A	125 / 134a / 143a / R 600a	0.0	3245
HFC 437A	125 / 134a / R 600 / R 601	0.0	1805
HFC 438A	32 / 125 / 134a / R 600 / R 601a	0.0	2265
HFC 442A	32 / 125 / 134a / 152a / 227ea	0.0	1888
HFC 507	125 / 143a	0.0	3985
HFC 508A	23 / PFC 116	0.0	13214
HFC 508B	23 / PFC 116	0.0	13396
Isceon 89	125 / PFC 218 / R 290	0.0	3805

Section B - Hydrocarbons (HCs)

Fluid Name / Number	Constituents of Blend	ODP	100 Year GWP
HC Blends			
Care 30	290 / 600a	0.0	3
Care 50	170 / 290	0.0	3

Section C - Perfluorocarbons (PFCs)

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
Pure PFCs			
PFC 14 Tetrafluoromethane (Perfluoromethane, Carbon tetrafluoride)	CF ₄	0.0	7390
PFC 116 Hexafluoroethane (Perfluoroethane)	C ₂ F ₆	0.0	12200
PFC 218 Octafluoropropane (Perfluoropropane)	C ₃ F ₈	0.0	8830
PFC 3-1-10 Decafluorobutane (R 31-10) (Perfluorobutane)	C ₄ F ₁₀	0.0	8860
PFC 4-1-12 Dodecafluoropentane (R 41-12) (Perfluoropentane)	C ₅ F ₁₂	0.0	9160
PFC 5-1-14 Tetradecafluorohexane (R 51-14) (Perfluorohexane)	C ₆ F ₁₄	0.0	9300
PFC c-318 Octafluorocyclobutane (Perfluorocyclobutane)	c-C ₄ F ₈	0.0	10300



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Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
Other perfluorinated compounds			
Nitrogen trifluoride	NF ₃	0.0	17200
Perfluoropolymethylisopropyl-ether (PFPMIE)	CF ₃ OCF(CF ₃)CF ₂ OCF ₂ OCF ₃	0.0	10300
Trifluoromethyl sulphur pentafluoride	SF ₅ CF ₃	0.0	17700
Perfluorocyclopropane	c-C ₃ F ₆	0.0	17340 ^{Fn (4)}
Sulphur hexafluoride	SF ₆	0.0	22800

Section D - Fluorinated ethers and alcohols (HFEs)

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
HFEs			
HFE 125	CHF ₂ OCF ₃	0.0	14900
HFE 134 (HG 00)	CHF ₂ OCHF ₂	0.0	6320
HFE 143a	CH ₃ OCF ₃	0.0	756
HCFE 235da2 (Isofluorane)	CHF ₂ OCHCF ₃	0.0	350
HFE 245cb2	CH ₃ OCF ₂ CF ₃	0.0	708
HFE 245fa2	CHF ₂ OCH ₂ CF ₃	0.0	659
HFE 254cb2	CH ₃ OCF ₂ CHF ₂	0.0	359
HFE 347 mcc3 (HFE 7000)	CH ₃ OCF ₂ CF ₂ CF ₃	0.0	575
HFE 347pcf2	CHF ₂ CF ₂ OCH ₂ CF ₃	0.0	580
HFE 356pcc3	CH ₃ OCF ₂ CF ₂ CHF ₂	0.0	110
HFE 449sl (HFE 7100)	C ₄ F ₉ OCH ₃	0.0	297
HFE 569sf2 (HFE 7200)	C ₄ F ₉ OC ₂ H ₅	0.0	59
HFE 43-10pccc124 (H-Galden 1040x) HG 11	CHF ₂ OCF ₂ OC ₂ F ₄ OCHF ₂	0.0	1870
HFE 236ca12 (HG 10)	CHF ₂ OCF ₂ OCHF ₂	0.0	2800
HFE 338pcc13 (HG 01)	CHF ₂ OCF ₂ CF ₂ OCHF ₂	0.0	1500
HFE 347mmy1	(CF ₃) ₂ CFOCH ₃	0.0	343
2,2,3,3,3-Pentafluoropropanol	CF ₃ CF ₂ CH ₂ OH	0.0	42
Bis(trifluoromethyl)-methanol	(CF ₃) ₂ CHOH	0.0	195
HFE 227ea	CF ₃ CHFOCF ₃	0.0	1540
HFE 236ea2 (Desfluoran)	CHF ₂ OCHFCF ₃	0.0	989
HFE 236fa	CF ₃ CH ₂ OCF ₃	0.0	487
HFE 245fa1	CHF ₂ CH ₂ OCF ₃	0.0	286
HFE 263fb2	CF ₃ CH ₂ OCH ₃	0.0	11
HFE 329 mcc2	CHF ₂ CF ₂ OCF ₂ CF ₃	0.0	919
HFE 338 mcf2	CF ₃ CH ₂ OCF ₂ CF ₃	0.0	552
HFE 338mmz1	(CF ₃) ₂ CHOCHF ₂	0.0	380
HFE 347 mcf2	CHF ₂ CH ₂ OCF ₂ CF ₃	0.0	374
HFE 356 mec3	CH ₃ OCF ₂ CHFCF ₃	0.0	101
HFE-356mm1	(CF ₃) ₂ CHOCH ₃	0.0	27
HFE 356pcf2	CHF ₂ CH ₂ OCF ₂ CHF ₂	0.0	265
HFE 356pcf3	CHF ₂ OCH ₂ CF ₂ CHF ₂	0.0	502
HFE 365 mcf3	CF ₃ CF ₂ CH ₂ OCH ₃	0.0	11
HFE 374pc2	CHF ₂ CF ₂ OCH ₂ CH ₃	0.0	557
	- (CF ₂) ₄ CH (OH)-	0.0	73



Section E - Non-Fluorinated Substances and Other Fluids

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
<u>Non-Fluorinated Substances</u>			
Methane	CH ₄	0.0	25
R-170 Ethane	CH ₃ CH ₃	0.0	6
R-290 Propane	CH ₃ CH ₂ CH ₃	0.0	3
R-600 Butane	CH ₃ CH ₂ CH ₂ CH ₃	0.0	4
R-600a Isobutane	CH(CH ₃) ₂ CH ₃	0.0	3
R-601 Pentane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₃	0.0	5 ^(?)
R-601a Isopentane	(CH ₃) ₂ CHCH ₂ CH ₃	0.0	5 ^(?)
R-610 Ethoxyethane (diethyl ether)	CH ₃ CH ₂ OCH ₂ CH ₃	0.0	4
R-611 Methyl formate	HCOOCH ₃	0.0	25
R-702 Hydrogen	H ₂	0.0	6
R-1150 Ethylene	C ₂ H ₄	0.0	4
R-1270 Propylene	C ₃ H ₆	0.0	2
Dimethyl ether	CH ₃ OCH ₃	0.0	1
Methylene chloride	CH ₂ Cl ₂	0.0	9
Methyl chloride	CH ₃ Cl	0.0	13
Chloroform	CHCl ₃	0.0	31
Cyclopentane	C ₅ H ₁₀	0.0	5 ^(?)

Fluid Name / Number	Chemical Formula	ODP	100 Year GWP
Other Fluids			
R-717 Ammonia	NH ₃	0.0	0
R-718 Water	H ₂ O	0.0	0
R-744 Carbon dioxide	CO ₂	0.0	1
R-764 Sulphur dioxide	SO ₂	0.0	0
Nitrous oxide	N ₂ O	0.0	298



ANNEX C

THE F-GASES REGULATION (EU) No. 517 / 2014

RECORD MAINTENANCE TEMPLATE

[A record for each calendar year must be kept by Operators for relevant equipment. If there have been any unintentional (accidental) F-gas emissions then these must be reported to DECC's Offshore Inspectorate - using the [Annex D](#) form - within 48 hours of it being established that such an incident had occurred.]

RECORD MAINTENANCE TEMPLATE FOR THE EU F-GASES REGULATION [Add / expand rows under headings as necessary]					
Year					
1. Installation Name and Operator:					
2. Equipment (make / model) i.e. refrigeration system, air-conditioning unit, fire-protection system, heat pump or electrical switchgear			3. Quantity (kgs) of F-Gas in equipment - at start of year i.e. Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) or Sulphur Hexafluoride (SF6)		
4. Equipment manufacturer:			5. Year equipment supplied:		
6. Amounts of F-Gases Added			HFCs (kgs)	PFCs (kgs)	SF6 (kgs)
Date	Name of Company / technician who performed maintenance / servicing	Reasons for additions	Were the quantities added either recycled or reclaimed F-gases?		Has the equipment label been updated?
			Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
			If Yes - provide name / address of recycling or reclamation facility (plus certificate number if applicable):		If No - why not?
Annual total (kgs) of F-Gases added					
7. Amounts of F-Gases Removed / Recovered			HFCs (kgs)	PFCs (kgs)	SF6 (kgs)
Date	Name of Company / technician who performed maintenance / servicing (plus certificate number if applicable)	Reasons for removal (e.g. equipment decommissioning) - what was done with the removed / recovered F-gases (e.g. sent to onshore facility for disposal)?			
Annual total (kgs) of F-Gases removed / recovered					
8. Leak Tests					
Date	Name of Company / technician who performed leakage checking	Test result (including location / cause of any leaks identified)	Follow-up actions required (e.g. repairs)		
9. Annual total of intentional (operational) plus unintentional (accidental) emissions of F-Gases			HFCs (kgs)	PFCs (kgs)	SF6 (kgs)
10. Date(s) when data in Section 9 was reported to EEMS for each type of F-Gas (inset date under category)			HFCs (kgs)	PFCs (kgs)	SF6 (kgs)
11. Annual total of unintentional (accidental) F-Gas emissions reported to DECC via the Annex D form			HFCs (kgs)	PFCs (kgs)	SF6 (kgs)
12. Testing of Leakage Detection Systems (if applicable)					
Date	Name of Personnel / Company (contractor)	Test results		Comments	
13. Name of any other company / technician who has installed, serviced, maintained, repaired or decommissioned the equipment (plus certificate number if applicable):					



ANNEX D

THE F-GASES REGULATION (EU) No. 517 / 2014

REPORTING FORM FOR UNINTENTIONAL (ACCIDENTAL) EMISSIONS OF F-GASES

[This form must be used by Operators for reporting any unintentional (accidental) emissions of F-gases from individual items of equipment to DECC's Offshore Inspectorate via: offshore.inspectorate@decc.gsi.gov.uk within 48 hours of it being established that such an incident had occurred - refer to [Annex B](#) for CO2 Calculation Method and Global Warming Potentials (GWPs).]

REPORTING FORM FOR THE EU F-GASES REGULATION [Add / expand rows under headings as necessary]						
Reporting year:						
Report number:						
Date submitted:						
1. Installation Name and Operator:						
Company Postal Address (Head Office):						
Telephone number:				E-mail:		
2. Equipment (make / model) i.e. refrigeration system, air-conditioning unit, heat pump, fire-protection system or electrical switchgear (<i>provide details on one category only</i>):						
3. Equipment manufacturer:				4. Year equipment supplied:		
5. Date when it was established incident had occurred:						
6. Details / likely cause of incident:						
7. Quantity in kgs (plus corresponding amount in tonnes of CO2 equivalent (t/CO2/e)) of F-gases emitted during incident (estimated if necessary)	Hydrofluorocarbons (HFCs)		Perfluorocarbons (PFCs)		Sulphur Hexafluoride (SF6)	
	kgs	t/CO2/e	kgs	t/CO2/e	kgs	t/CO2/e
8. Steps taken to resolve / prevent re-occurrence of the incident:						
<i>For DECC Purposes Only</i>						
Environmental Inspector:						
Inspector's Assessment: No Further Action <input type="checkbox"/> Further Information Requested <input type="checkbox"/>						
Further Action Taken <input type="checkbox"/>						
Additional Details:						
Date Completed:						



ANNEX E

THE F-GASES REGULATION (EU) No. 517 / 2014

REGULATORY NON-COMPLIANCE NOTIFICATION FORM

[This form should be used by Operators for reporting to DECC's Offshore Inspectorate (offshore.inspectorate@decc.gsi.gov.uk) any potential, or actual instances of, non-compliance with the obligations of the F-Gases regulatory regime.]

NON-COMPLIANCE NOTIFICATION FORM FOR THE EU F-GASES REGULATION [Add / expand rows under headings as necessary]

Identity of Reporter

Full Name:

Organisation / Company:

Contact Telephone No:

Contact E-Mail:

Installation Details

Installation Name and Operator:

Details of Regulatory Non-Compliance Notification

Date Non-compliance Identified:

Details and Cause of Non-compliance:

Steps taken to prevent re-occurrence of Non-compliance:

Is the incident that has led, or may lead, to Non-compliance likely to result in a significant environmental impact? YES NO

If Yes please provide details:



ANNEX F

THE F-GASES REGULATION (EU) No. 517 / 2014

SPECIFIC REGULATORY ASPECTS TO BE ASSESSED BY DECC'S OFFSHORE INSPECTORS

- (i) Prompt repairing of detected F-gas leakages from equipment and the checking of repairs within 1 month to verify effectiveness.
- (ii) Leak testing regimes in place to meet the periodic leakage checking frequencies of:
 - (a) every 12 months for equipment containing F-gases equating to 5 tonnes of CO₂/e or more, but less than 50 tonnes of CO₂/e (or every 24 months where a leakage detection system (LDS) is installed);
 - (b) 6 monthly for equipment containing F-gases equating to 50 tonnes of CO₂/e or more, but less than 500 tonnes of CO₂/e (or every 12 months if a LDS is installed); and
 - (c) 3 monthly for equipment containing F-gases equating to 500 tonnes of CO₂/e or more (or every 6 months where a LDS is installed).

Noting that:

- ❖ The leakage checking obligations for fire protection equipment (FPE) would be fulfilled if the leakage checking regime meets ISO 14520 or EN 15004 standards, and the FPE is checked for leaks as per the frequencies outlined in parts (a) to (c) of item (ii) above.
- ❖ The derogations from the leakage checking requirements apply to:
 - Hermetically sealed equipment containing F-gases in quantities of < 10 tonnes of CO₂/e (provided the equipment is labelled as hermetically sealed).
 - Electrical switchgear providing:
 - (a) it has a tested leakage rate of < 0.1% per year as set out in the technical specification of the manufacturer and is labelled accordingly;
 - (b) it is equipped with a pressure or density monitoring device; or
 - (c) it contains < 6 kgs of F-gases.
 - Until 31 December 2016, equipment containing < 3 kgs of F-gases or hermetically sealed equipment which is labelled accordingly and contains < 6 kgs of F-gases will be exempted from leak checks (i.e. the leakage checking requirements will apply from 1 January 2017).
- (iii) The installation of leakage detection systems (LDS) to:



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- Relevant equipment (i.e. stationary refrigeration equipment; stationary air-conditioning equipment; stationary heat pumps; and stationary fire protection equipment) which contains F-gases in quantities of 500 tonnes of CO₂/e or more - plus the checking of LDS every 12 months to verify proper functioning.
- Electrical switchgear containing F-gases in quantities of 500 tonnes of CO₂/e or more and which is installed from 1 January 2017 - plus the checking of such LDS once every 6 years to verify proper functioning.

(iv) The maintenance (for at least 5 years) of proper records which cover:

- the quantity and type of F-gases installed in operational equipment (not to include F-gases contained in stock cylinders which are used for maintenance / servicing e.g. topping-up appliances);
- the quantities of F-gases added during installation, maintenance or servicing or due to leakage;
- whether the quantities of installed F-gases have been recycled or reclaimed, including the name / address of the recycling / reclamation facility and, if applicable, the certificate number;
- the quantity of F-gases recovered;
- the identity of the undertaking (e.g. contractor) which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;
- the dates / results of the leakage checks carried out in line with the requirements of item (ii) above; and
- if the equipment was decommissioned, the measures taken to recover and dispose of the F- gases.

(v) The appropriate recovery of F-gases from equipment for recycling, reclamation or destruction (including the availability / use of suitable F-gas recovery apparatus).

(vi) The appropriate labelling of F-gas containing equipment.

(vii) Adherence to the prohibition from 1 January 2020 on the use of F-gases with a global warming potential (GWP) of 2,500 or more to service or maintain refrigeration equipment with a charge size of 40 tonnes of CO₂/e or more - **noting that the prohibition will not apply to:**

(a) equipment intended for applications designed to cool products to temperatures below - 50°C; and

(b) the following categories of F-gases **until 1 January 2030:**



- Reclaimed F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment.
 - Recycled F-gases with a GWP of 2,500 or more used for the maintenance or servicing of existing refrigeration equipment provided they have been recovered from such equipment.
- (viii) The annual reporting to EEMS of: **(a)** the total amount of intentional (operational) plus unintentional (accidental) emissions of F-gases; and **(b)** the total quantity of F-gases contained in equipment and stock cylinders.
- (ix) The submission of Annex D forms for the separate (additional) reporting of unintentional (accidental) F-gas emissions.
- (x) The maintaining of records (together with those set out in item (iv) above) relating to intentional and unintentional F-gas emissions.
- (xi) The carrying out of equipment installation, servicing and maintenance / repairs (including F-gas removal / recovery) and decommissioning by in-house (i.e. Operator) technicians who are appropriately certified (qualified) or by undertakings (e.g. contractors) that hold the requisite 'company certificates' and which employ suitably certified (qualified) personnel.
- (xii) The purchasing of F-gas containing equipment by:
- undertakings (e.g. contractors) which hold the relevant 'company certificates'; or
 - Operators that use personnel ('in-house technicians' or 'contractors') who are appropriately certified (qualified).

Noting that:

- ❖ Where Operators purchase non-hermetically sealed equipment as the end-users they must provide to the supplier a letter stating that the equipment will be installed by either:
 - (a)** personnel who are certified (qualified) in accordance with the relevant provisions of Article 10; or
 - (b)** personnel from a contractor which holds a 'company certificate' in line with the pertinent obligations of Article 10.
- (xiii) The notification of any incidents of regulatory non-compliance via the Annex E form.
- (xiv) General improvements planned for the future.



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