Department for Environment, Food and Rural Affairs

General Guidance for Switchgear Containing SF_6

Guidance: F Gas and Ozone Regulations

Information Sheet SCS 2: Usage

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Contents

This Information Sheet provides background information about the use of switchgear containing sulphur hexafluoride (SF_6). We provide a description of the sources of emissions and options for reducing emissions through improved containment or use of alternatives.

Switchgear containing SF_6 is used in electricity transmission and distribution systems at power stations, sub-stations and, occasionally, at end user premises. Most equipment is leak tight, however some designs are not as good as others and there are sometimes "problem" pieces of kit. In addition, there is the potential to lose SF_6 on initial filling of the equipment and this must be guarded against. Finally, switchgear containing SF_6 is commonly used on industrial sites and it is possible that older equipment may be fitted that is not clearly labelled as containing SF_6. Vigilance is important from site engineers to ensure that activities involving the handling of SF_6 at these installations are properly recorded and handled, especially on disposal of equipment.

It is worth noting that SF_6 is the most "powerful" greenhouse gas. Emission of 1 kg of SF_6 is equivalent to the emission of 22,200 kg of CO_2. This means that even very small emissions are harmful to the environment. Every effort should be made to minimise emissions of SF_6 from switchgear.

Options for Reducing F Gas Emissions

Fully complying with the EC F gas Regulation can help reduce emissions of SF_6. SF_6 leakage is costly in both financial and environmental terms. To get the lowest possible loss of SF_6 from switchgear users should consider taking the following steps:

1 Only purchase equipment that is "leak tight"

The relevant international standard for High Voltage Switchgear is IEC 62271 which has a number of parts dealing with the individual types. This Standard specifies the degree of gas tightness for the different gas technologies used – it covers all the switchgear available to purchase now and therefore all purchases of new switchgear containing SF_6 should be made with this standard in mind.

2 Maintaining records

Data, such as cause of previous leaks, makes management of leakage problems easier and more effective and makes it easier to identify problem systems. Where appropriate, consider using the record keeping methodology proposed by the Electricity Networks Association (ENA) Engineering Recommendation S38 on reporting of SF_6 banks, emissions and recoveries, which can be obtained from the ENA. You may also wish to consider using the asset management standard PAS 55 to manage your switchgear.

3 Ensure you use well qualified and trained personnel

Make sure all personnel (both in-house and contractors) working on switchgear containing SF_6 understand the environmental impacts of emitting SF_6 to the atmosphere. Initial filling of equipment is an area where significant emissions can occur. Ensure all personnel are properly trained to minimise emissions, especially on initial filling of equipment, please see Information Sheet SCS 5 for more details about personnel qualifications.

4 Dispose of unwanted SF_6 containers

Do not leave unwanted cylinders of SF_6 in storage; return them to a suitable company for recovery or destruction of residual SF_6.

Considering Alternatives

The use of SF_6 as an insulant in switchgear has grown for a number of reasons; companies find it a very effective and stable gas, the volume required to provide the same protection is less so the physical footprint required is also reduced.

There are alternatives - air, a vacuum with a solid dielectric or oil. Each has their own benefits and drawbacks. The important considerations when selecting the most appropriate one are:

- The space available to house the switchgear,
- The voltage of the switchgear,
- The maintenance requirements,
- Consideration of the health and global warming impact of emissions of SF_6 or by-products.