Management of Sulfur Hexafluoride (SF\(_6\)) Gas

Created By: P. O’Leary Reviewed By: J. Dalton
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1.0 Purpose

This procedure establishes a protocol to manage the use of Sulfur Hexafluoride (SF\(_6\)) Gas for safe handling, storage, and reconciliation.

2.0 Scope

This procedure applies to all SF\(_6\) Gas within Newfoundland Power.

3.0 General

Newfoundland Power manages its SF\(_6\) so that is is handled and stored in a safe and environmentally responsible manner.

4.0 Responsibilities

4.1 The Director, Engineering shall assign the resources necessary to effectively satisfy and complete the requirements of this procedure.

4.2 The Senior Electrical Engineer responsible for Asset Management of the electrical equipment shall ensure that this procedure is properly implemented with respect to the substation maintenance practices and procedures.

4.3 The Manager, Electrical Maintenance and the Supervisor Electrical Maintenance shall ensure that this procedure is followed at the facilities for which they are responsible.
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5.0 Procedure

5.1 Introduction

SF₆ gas, in the pure state, is colorless, odorless, tasteless and non-toxic. SF₆ is used as an insulating and arc extinguishing medium in electrical equipment. It is also a powerful greenhouse gas with no viable substitute.

SF₆ gas is approximately five times heavier than air and will displace air in confined spaces. SF₆ gas contains no oxygen and will not support life. Confined spaces must be force-ventilated when working with SF₆ gas.

5.2 General Handling

5.2.1 SF₆ gas is supplied in pressurized cylinders, and as such, are capable of being damaged or ruptured by careless handling. Gas cylinders must be stored upright and firmly secured to prevent falling or being knocked over. As well, cylinders should be stored in a cool, dry, well-ventilated area. Refer to OPR101.10 - Compressed Air and Other Gases and OPR110.08 – Sulfur Hexafluoride (SF₆) Equipment for additional information.

5.2.2 SF₆ gas handling, in filling or retrieval from SF₆ insulated equipment, should only be done outdoors or, if indoors, have ventilation and/or a system for detecting this halogen placed at the lowest points of the installations.

5.2.3 If, when handling used SF₆, leakage results in the odor of rotten eggs, personnel should evacuate the area unless equipped with respiratory equipment.

5.2.4 Detectable leakage should not be tolerated at hose fittings, etc. due to the possibility of a build-up of gas concentrations in local or low areas and emissions.
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5.3 Cylinder Identification

Cylinders containing SF₆ Gas shall be marked with a unique alphanumeric cylinder identifier. This identifier will consist of:

- The 3-letter Company abbreviation for the Area where the cylinder is first used or introduced
- The 3-letter “SF6” identifier for all locations
- The 3-digit number corresponding to the sequence in which they were introduced from this location (e.g. the first would be 001, the second would be 002 and so on).
- The three parts of the identifier will be separated by hyphens. The cylinder identifier will be located on the side of the cylinder.
- The unique alphanumeric cylinder identifier should remain with the cylinder as long as the cylinder is used within the Company, even if the cylinder is sent to a different location.

Examples: The first cylinder labeled using this system at the EMC will be identified as EMC-SF6-001. The 4th cylinder used in Carbonear will be identified as CAR-SF6-004. If cylinder STV-SF6-001 is sent to Carbonear it remains identified as STV-SF6-001.

5.4 Cylinder Management

All cylinders will be weighed and recorded as follows:

5.4.1 The Tare and Gross weight of all newly introduced cylinders will be recorded as per respective weight stamped on the cylinder(s).
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5.4.2 The Tare (weight of cylinder) will be subtracted from the Gross (weight of cylinder plus the weight of the gas) to obtain the Net (weight of gas).

5.4.3 The Manager, Electrical Maintenance shall be responsible for implementing and maintaining a tracking system that shall be used to identify the weight of the gas that is used to replace any gas lost to the environment. The weight of each cylinder shall be recorded before the start of such work and also at the end of the work to determine the amount of SF₆ that was used.

5.4.4 In addition to the tracking system above, all work to replenish SF₆ gas shall be set up as an Avantis work order with an activity included to weigh the tank before and after usage, indicating the unique alphanumeric identifier on the cylinder(s) from which the gas was removed.

5.4.5 An annual Work Order shall be set up in Avantis to weigh all cylinders and reconcile the data in the tracking system.

5.5 Reclamation

The intentional release of SF₆ to the atmosphere is prohibited. A gas reclaimer must be used to evacuate and store SF₆ from equipment.

Evacuate the SF₆ gas from the equipment into the gas reclaimer. Follow the manufacturer instructions for the proper operation of the gas reclaimer.

6.0 References

6.1 Reference Documents

- Substation Maintenance Standard/Reference MSR019 – SF6 Gas
- OPR110.08 – Sulfur Hexafluoride (SF6) Equipment
- OPR101.10- Compressed Air and Other Gases
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6.2 Related Significant Aspects

• **190**

7.0 Records

• **SF6 Tracking System**

8.0 Glossary

Abbreviations
• **SF₆** – Sulfur Hexafluoride