

SULFUR HEXAFLUORIDE (SF₆) FAQ

SULFUR HEXAFLUORIDE (SF₆) CHARACTERISTICS

- Inert
- Non-toxic
- TLV & PEL = 1000 PPM
- Molecular Weight: 146.05 (approximately 5 times heavier than air)
- Detectable to 1 ppt
- Not normally found in background air
- Colorless
- Odorless

HOW MUCH GAS WILL BE ON SITE?

Typically SIX cylinders, as a mixtures of SF₆ and “ultra zero air” are required for testing.

| | <u>Type Of Cylinder</u> | <u>Size & Volume</u> | <u>Concentration of SF₆</u> |
|---|---------------------------|-----------------------------------|--|
| | Injection Gasses | | |
| 1 | Type AL (1L) | 8" x 53" (140 ft ³) | 10,000 ppm |
| 2 | Type AL (1L) | 8" x 53" (140 ft ³) | 1000 ppm |
| 3 | Type AL (1L) | 8" x 53" (140 ft ³) | 500 ppm |
| | Calibration Gasses | | |
| 4 | Type BL (2L) | 7.25" 39.3" (76 ft ³) | 50 ppb |
| 5 | Type BL (2L) | 7.25" 39.3" (76 ft ³) | 25 ppb |
| 6 | Type BL (2L) | 7.25" 39.3" (76 ft ³) | 10 ppb |

Total amount of SF₆ for all six cylinders is *LESS THAN 0.5 POUNDS*.

WHAT CONCENTRATION WOULD BE EXPECTED IN THE CONTROL ROOM IF THE 10,000 ppm CYLINDER FAILED?

Assuming the 10,000 ppm (1%) concentration cylinder failed and released its entire contents at once into a control room volume of 40,000 ft³ the concentration of SF₆ would be less than 40 ppm.

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WHAT CONCENTRATION WOULD BE EXPECTED IN THE CONTROL ROOM IF ALL OF THE CYLINDERS FAILED?

If all SIX cylinders failed at the same time the total concentration of SF₆ would still be less than 40 ppm.

HOW IS THE SF₆ INTRODUCED INTO THE CONTROL ROOM?

Typically it is introduced into the control room through the outside air intake or through the air handling equipment.

WILL THE CONTROL ROOM PERSONNEL BE ABLE TO SMELL THE SF₆?

No.

SF₆ is colorless, odorless, inert and non-toxic. Control room personnel will not be aware of any testing except for the presence of NUCON personnel and test instruments,

WILL ANYTHING SPECIAL NEED TO BE DONE TO SUPPORT TESTING?

Depending upon the control room and ventilation systems physical layout and mode of operation, some ceiling tiles and floor tiles (such as in the computer room) may need to be removed. Also, some doors may need to be propped open and additional mixing fans may be required to ensure uniform mixing of the SF₆ tracer gas.

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HOW LONG DOES THE TEST TAKE?

A characterization test usually takes one shift. And, for planning purposes assume one shift per test line-up (mode). Ingress and egress must be minimized during the tracer gas equilibration period.

It takes about two-to-three (2-3) hours for the tracer gas to come to equilibrium. The actual sampling period the control room will need to be “locked-down” is also about two-to-three (2-3) hours.

WHEN IS THE BEST TIME TO PERFORM THE TEST?

Most testing is performed during the second and third shift periods when control room traffic is at a minimum.

CHARCOAL IMPACT STATEMENT

NUCON has used SF₆ (sulfur hexafluoride) as a “tracer” agent at several nuclear power plant sites for CR leakage and fan airflow performance testing.

Based on standard radioiodine tests done before and after such testing we conclude that using SF₆ as a tracer agent has no deleterious effect on installed charcoal. This is as expected for a weakly adsorbed gas like SF₆, especially at ppb concentrations.