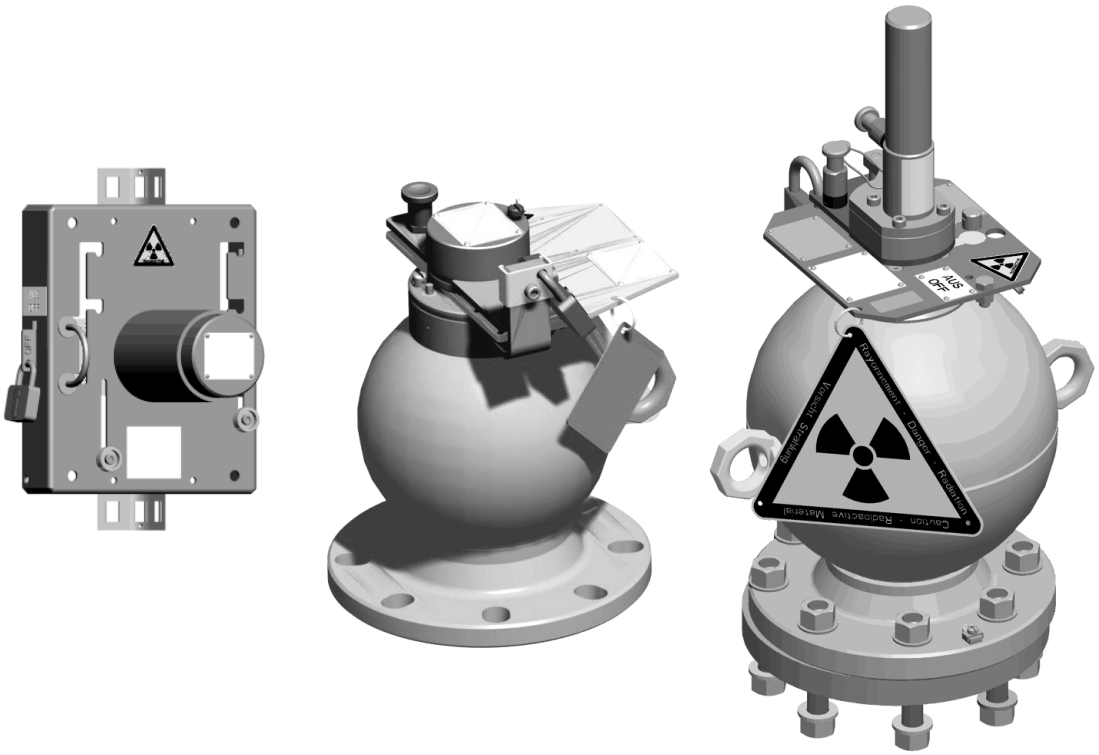
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

Radiation Source Container FQG60, FQG61, FQG62, FQG63

Supplementary safety instructions for radioactive sources and source containers approved for use in Canada



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Endress+Hauser
People for Process Automation

Introduction

Scope of application

The safety instructions contained in this document apply to radioactive sources and source containers which have been approved by the CNSC for the use in Canada.
This document does not substitute the Operating Instructions TI00445F (FQG60), TI00435F (FQG61/62), TI00446F (FQG63).
When operating a source container within Canada, the respective Operating Instructions have to be strictly observed as well as the procedures described in this document.

Leak test procedure

Equipment to be tested

A leak test is required if the source activity is greater than 50 MBq.

Frequency of leak testing

Subject to other regulations by CNSC the device has to be tested
- once every 12 months for sources in continuous operation
- once every 24 months if the source is placed into continuous storage
- immediately, if the source is placed back into operation after being stored for 12 or more consecutive months (replaces any previous test that may have been done during the previous 12 months while in storage).

Note!
Leak tests are required whenever an incident occurs that may damage the sealed source or shielding. The leak test must be performed as soon as possible after the incident.

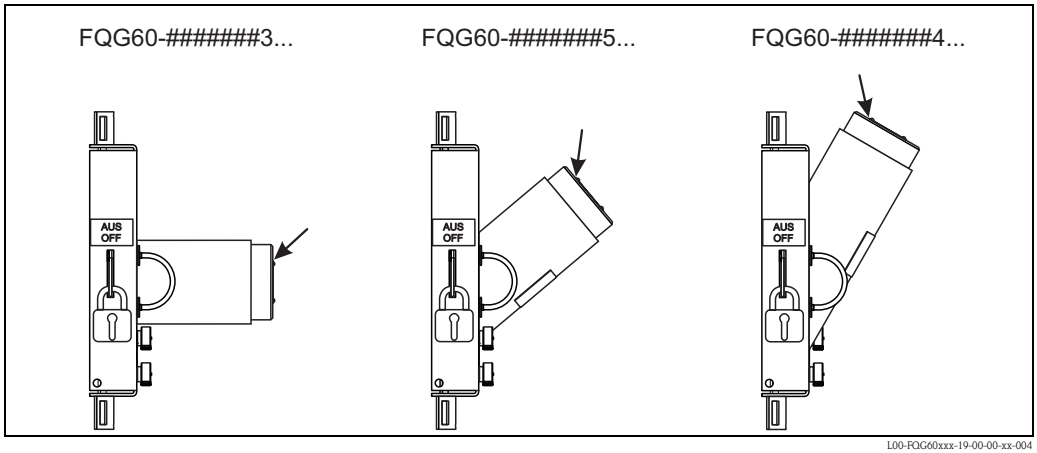
Leak test procedure

Note!
Ensure that the person collecting the leak test samples has:
- access to and follows approved leak test procedures
- received radiation safety training to control any associated radiation hazard
- sufficient sampling materials and leak test sampling certificates.

1. Proceed as follows:

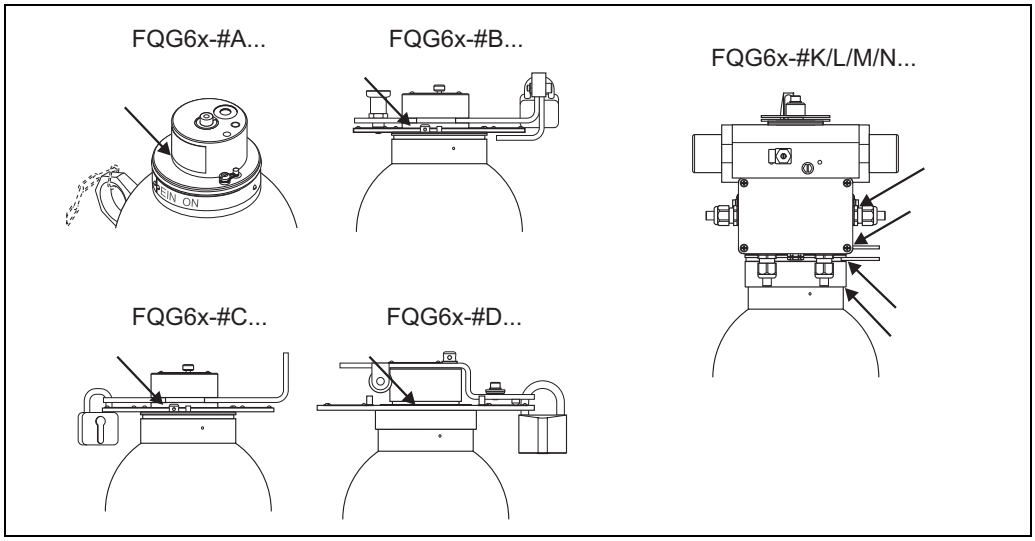
a) FQG60

Wipe along the edges of the stainless steel name plate as marked in the following figure:



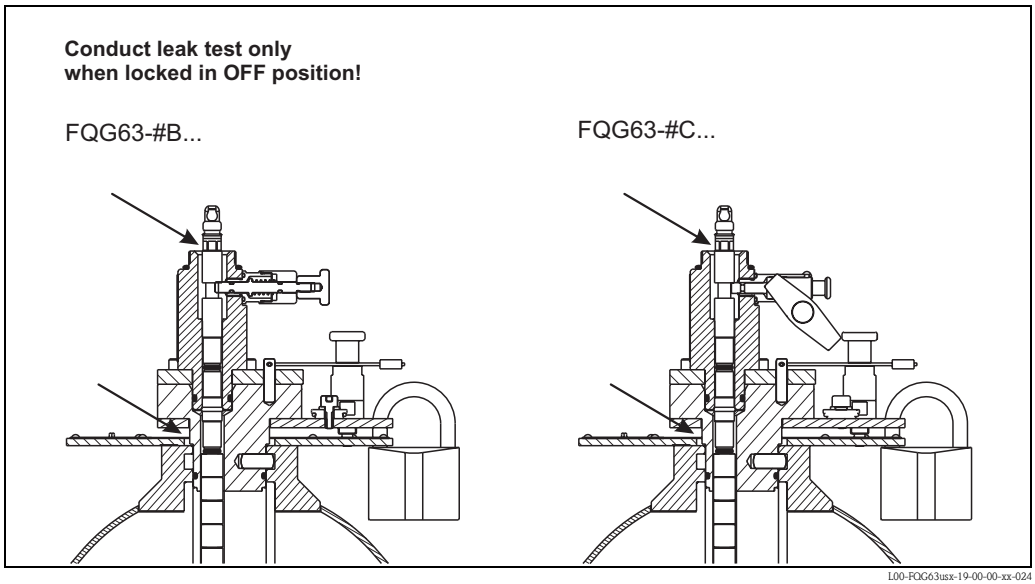
b) FQG61, FQG62

Wipe along the annular gaps as marked in the following figure:



c) FQG63

Wipe along the annular gaps as marked in the following figure:



2. Have the samples analysed by a CNSC approved laboratory.
   A source is to be considered leaking if more than 200 Bq is detected on a leak test sample.
3. In case of an indeed leaking source:
   – immediately discontinue use of the device
   – contact the responsible radiation protection officer for instructions
   – take appropriate measures to control a potential spread of radioactive contamination from the source. Secure the source
   – notify CNSC that a leaking source has been detected.

Visual check

If considerable corrosion is visible at the housing (FQG60: especially in the area of the shutter plate; FQG61/62: especially at the cover plate of the radiation channel) measure the radiation level around the device. If values occur exceeding the normal operation level, cordon off the area and contact immediately the responsible radiation safety officer for instructions. In any case corroded devices or corroded parts of devices shall be exchanged as soon as possible.
For FQG63: Source containers with corroded extension element, interlocks or source holder rods require immediate exchange.

Emergency procedure

Objective and overview

This emergency procedure should be put into effect immediately to secure an area in the interests of protecting personnel where an exposed source is known, or suspected, to exist.
Such an emergency exists when a radioisotope is exposed either by it becoming separated from the source container or the source container shutter cannot be closed or if available, the extension element or the shutter cannot be moved to OFF position.
This procedure will safeguard an area until an appropriate radiation protection officer can attend site and advise on corrective action.
The custodian of the radioactive source (the customer's designated "authorized person") is responsible for observing this procedure.

Procedure

1. Determine the unsafe area by measurement (on site) or by calculation knowing the size and type of source installed from the records.
2. Cordon off the area at the boundary where the radiation level exceeds 2.5 μSv/h (0.25 mR/h) by yellow tape or rope and post international radiation warning signs. In case of a shutter that will not close:

a) FQG60:

– If part of the area is accessible (e.g. a vessel in the event of a level gauge installation where there is a possibility that a person might enter), the source housing should be unbolted from its mounting and laid face down on the ground or put emission channel towards a thick wall. The weight of approx. 18 kg (39.7 lbs) allows manual handling.
– Personnel should at all times be behind the source housing, not in front of the emission channel (rectangular shutter plate).

b) FQG61/62:

– If part of the area is accessible (e.g. a vessel in the event of a level gauge installation where there is a possibility that a person might enter), the source housing should be unbolted from its mounting and laid face down on the ground or put emission channel towards a thick wall. The ring-eyelet on the housing should facilitate safe handling.
– Personnel should at all times be behind the source housing, not in front of the emission channel (flange).

In case of a shutter that will not close due to failure of the pneumatic actuator:
– Switch off or disconnect compressed air, remove supply lines if necessary. Open lower padlock, unscrew the allen screws adjacent to the pneumatic actuator and remove the complete actuator unit to get access to the source holder. Turn source holder manually to the marked off position.

c) FQG63:

In case the extension element is retracted but the swivel insert does not close:
– If part of the area is accessible (e.g. a vessel in the event of a level gauge installation where there is a possibility that a person might enter), the source housing (extension element in OFF position) should be unbolted from its mounting and laid face down on the ground or put emission channel towards a thick wall. The ring-eyelet on the housing should facilitate safe handling.
– Personnel should at all times be behind the source housing, not in front of the emission channel (flange).

In case the extension element is not retractable:
– If part of the area is accessible (e.g. a vessel in the event of a level gauge installation where there is a possibility that a person might enter), the source container should be unbolted, removed together with the inner proctection pipe from its mounting and laid down on the ground. The protection pipe should be immediately completely covered with a suitable shielding.
Personnel should at all times keep maximum possible distance from the protection pipe and sshould at all times be behind the source container, not in front of the emission channel (flange of the source container) or near the extension element or near the protection pipe.
The eye bolts on the housing should facilitate safe handling.

3. If it is not practical to cordon off the entire area or if the source is in immediate danger of moving, it may be necessary to secure the source by relocating it or adding shielding.
Here, the inverse square law should be observed, i.e. radiation reduces with distance quadratically. The source should only be handled via pliers or tongs and held as far away from the body as possible.
The time taken to fulfill the exercise should be minimized by rehearsal prior to execution.
4. Inform the local Canadian Nuclear Safety Commission Duty Officer responsible for the area in which the incident has occured, and ask for immediate action.

Telephone number: (613) 995-0479 (Ottawa)

This is to be done as soon as possible and not later than 24 hours of the incident being discovered.

5. After thorough assessment of the damage, the CNSC Inspector, in conjunction with Endress+Hauser, will agree a remedy to the specific problem.

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