

Gas Turbine Ignition Exciters

The ignition exciter is a gas turbine component that produces high electrical charge which is carried to the spark plugs via ignition leads. Gas turbines are typically equipped with an ignition exciter containing (2) two spark gaps, as shown. Each spark gap contains radioactive Krypton-85 gas sealed in a glass tube. The gas helps stabilize the high electric charge sent from the exciter to the spark plugs.

The potential safety or exposure risk is negligible given the actual radiation levels as determined by testing and analysis, the type of radiation emitted, and its location within a closed ionization chamber.

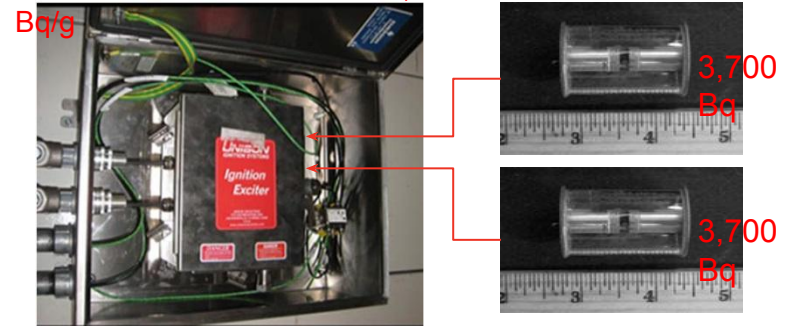
From Unison:

Dose 10cm from source μ Sv/hr= 0.1 max

Dose 30 cm away μ Sv/hr= ~background

The number of gas turbines at a site location multiplied by the number of exciters and spark gaps present may require the end user to obtain a license, permit or other regulatory approval, authorizing possession and/or use of material. In addition, there are international requirements for transport by air or sea (unless an exception applies).

Total: Activity= $2 \times 3.7\text{kBq} = 7,400 \text{ Bq}$
Concentration= $>100,000$



Ignition Exciter

2 Spark Gaps inside 1 Exciter

Spark Gaps are potted/embedded out of reach. No user serviceable access to embedded gaps.



Frame 9 Example of Location in Plant

GE TIL Communication:



IgnitionExciterTIL

Unison Technical Document:
(handling, maintenance, disposal, exposure, etc.)



Unison JP TechDocument

Unison's Disposal Program:



Unison Decommissioning



Generator Condition Monitor GCM-X

The GCM-X is *an OPTIONAL accessory* that provides real-time detection to give early warning of generator overheating and potential failure. High concentrations of submicron particles (pyrolytic products) are produced whenever any materials within the generator are heated sufficiently to produce thermal decomposition. These "hotspots" can lead to catastrophic failure if not detected in a timely manner.

When present in hydrogen, pyrolytic products are quickly detected by the sensitive ion chamber of the GCM-X. The GCM-X warns of impending generator failure faster and more reliably than temperature sensors such as RTD's or thermocouples.

If an emergency situation occurs, upon detection of generator hotspots, the GCM-X microprocessor initiates and monitors an alarm verification sequence. If the alarm is confirmed, a verified alarm indication is given; alarm contacts are switched; and a fixed amount of the hydrogen flow automatically passes through the sampling system. Particles are then collected for laboratory analysis to determine their source.

<http://www.eone.com/utility-systems/regions/us/generator-systems/gcmx/>

The potential safety or exposure risk is negligible given the actual radiation levels as determined by testing and analysis, the type of radiation emitted (alpha), and its location within a closed ionization chamber.

From eOne :

Dose 10cm from source μ Sv/hr= 0.04 max

Dose 30 cm away μ Sv/hr= ~background

However, due to the concentration and activity levels, the GCM-X may be subject to international requirements for transport by air or sea (unless an exception applies), and such levels may require an owner/operator in certain jurisdictions to obtain a license, permit or other regulatory approval, authorizing possession and/ or use of the GCM-X.



Total: Activity= 7,000 Bq
Concentration= 600



Approx 2 ft x 2 ft x 3 ft tall

Rear view

GCM-

1 ionization chamber in each

Ionization chamber is out of reach in normal operation.
Refer to eOne document regarding maintenance/service.

Location in Plant: Must be located within 50' transverse & 100' vertical of the Hydrogen Cooled Generator. Typical locations:

-7FH2 Leads Up (GT Driven) is located in the Cab near hydrogen panel.

GE TIL -All other configurations are standard eOne units near the hydrogen panel.

Communication:



GCM-X TIL

eOne Technical Document:

(handling, maintenance, disposal, exposure, disposal, etc.)

http://www.eone.com/web/user_content/files/eone/gcm-x-tds-d175-issue-08.pdf

eOne Disposal Program: E/One can be contacted regarding the return of GCM-X units to our facility. The return to E/One for disposal or recycling will be attended to under E/One's Return Merchandise Authorization (RMA) process.

http://www.eone.com/web/user_content/files/eone/gcm-x-tds-d175-issue-08.pdf