



VF NUCLEAR



NUCLEAR
POWER PLANTS



WASTE
MANAGEMENT



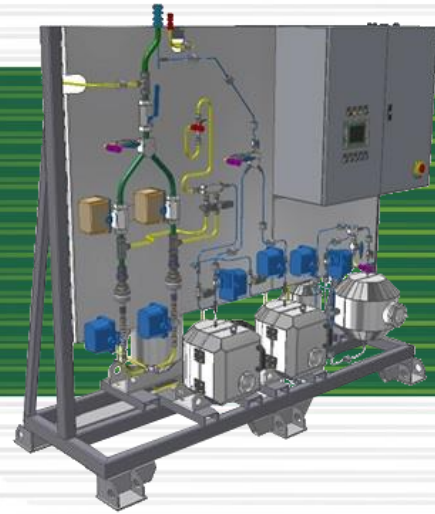
RESEARCH
CENTRES



INDUSTRY
& MANUFACTURING

GEMS-700

GASEOUS EFFLUENT MONITORING AND SAMPLING SYSTEM



MAIN ADVANTAGES

- Separate sections for routine and post-accident monitoring
- Automatic switching to post-accident mode of operation in case of increase of the activity of noble gases
- Dose rate measurement from post-accident P/I filters
- Safe sampling even in post-accident operation
- Determination total gaseous effluents
- Local control and display of the measured values and monitor status
- Remote control and display capability

PURPOSE

The GEMS-700 measures wide range of noble gas activities in the air, from very low to very high activities. It can be used for operational or regulatory monitoring of gaseous effluents in nuclear facilities.

The monitor includes two measuring parts: routine and post-accident. Modules for post-accident measurements are more durable, have thicker shielding and higher measuring ranges. One part includes aerosol and iodine filters for routine sampling, and the second part includes aerosol and iodine filters for emergency or post-accident monitoring. Filters in the post-accident part are shielded and equipped with a dose-rate detector.

If the noble gas detector detects a higher activity of noble gases during routine mode of operation, it automatically switches measurement to the post-accident part. If the activity continues growing, the routine part will automatically close.

Each part contains:

- Two redundant filter units - each with an aerosol and iodine filter
- Radioactive noble gas detector
- Two redundant pumps
- Pressure flow meters and valves
- Control and signaling elements

The components are placed on a robust skid.

Aerosols and iodine are trapped on filters upstream of the noble gas detectors. After a specified time, the monitor automatically switches the sampling filter. Due to redundant connections of filters, it is possible to measure without interruption even during filter replacement.

Low-activity noble gas detector (NGD-11) is used in the routine part. Mid-range (NGD-12) and high-range (NGD-13) detectors are used to measure the activity in the post-accident part. The flow of air through the monitor may be set as constant or proportional to the total flow rate through the ventilation stack, from where the sample is taken.

The monitor is equipped with self-diagnostics. There are ^{137}Cs check sources integrated in the dose-rate detectors used to measure the post-accident filters. The system also monitors the temperature and pressure and indicates when the pre-set thresholds have been exceeded. Both measuring parts are heated and have their own alarm system.

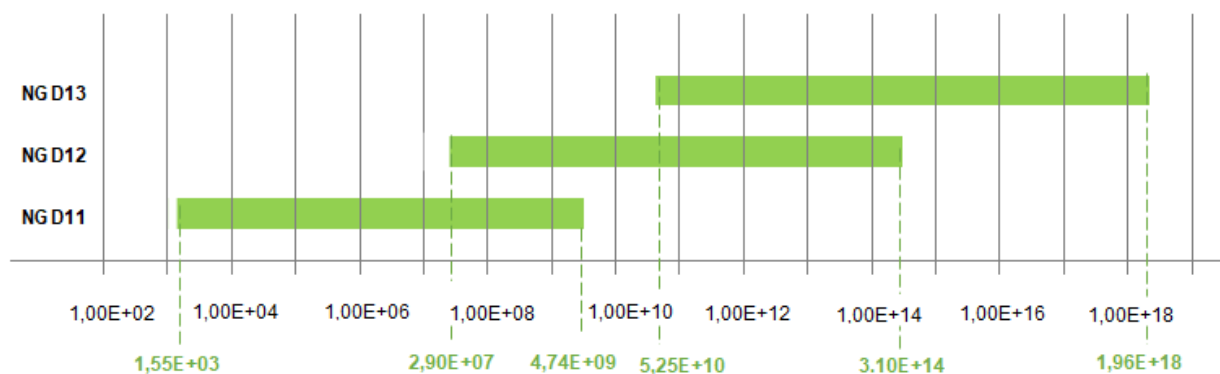
GASEOUS EFFLUENT MONITORING AND SAMPLING SYSTEM

RADIOMETRIC PARAMETERS

Detector	NGD-11	NGD-12	NGD-13
Radiation detection	beta	gamma	gamma
Detector type	plastic scintillator	semiconductor CdTe	semiconductor CdTe
Measuring range [Bq/m ³] (background 25 µSv/h)			
¹³³ Xe	3,65E+03 to 1,11E+10	2,47E+06 to 2,63E+13	1,57 E+09 to 5,85 E+16
⁸⁵ Kr	1,55E+03 to 4,74E+09	2,90E+07 to 3,10E+14	5,25 E+10 to 1,96 E+18

SPECIFICATIONS

Flow rate	
Routine part	55 l/min
Post-accident part	1 l/min
Dimensions (W × H × D)	(2540 × 2200 × 1140) mm
Weight	3500 kg
Interfaces	Ethernet, RS-485



NGD-1X detectors measuring ranges (⁸⁵Kr)

