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Results of Radiation Protection in Practices with Sources of Ionizing Radiation in the Petroleum Refining Industry

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Sources of ionizing radiation have wide application in medicine, industry, research, agriculture and education. These sources must be managed in conditions of safety and security. If used incorrectly or in unsafe conditions, radioactive sources can cause death, serious injuries and economic losses, as demonstrated by the experience in many areas of the world.

In the oil industry, specifically the oil refining industry has wide application of ionizing radiation sources in the following fields:

1. Study and control of catalysis.
2. Measure and control fluid flow.
3. Determination of residence times of liquids in closed systems.
4. Location of interfaces or separation zones of petroleum products circulating in the same pipe.
5. Analytical determination of components such as sulfur.
6. Studies on corrosion protection.
7. Fire detection and gas.
8. other

In Cuba three oil refineries are installed in different parts of the country the case in this work is the Cienfuegos refinery located in the south-central Cuba, specifically in the northern margin lobe of the Bay of Cienfuegos region. Its purpose is oil refining and product manufacturing, purchase, storage, processing, distribution and marketing of oil and petroleum products within the Cuban territory and abroad.

In the Cienfuegos oil refinery various types of sources of ionizing radiation, linked to the following practices are used:

1. Location of interfaces or separation zones fixed level nuclear gauges are used with Cesium sources ^{137}Cs , ^{137}Cs -137, for a total of eight sealed sources, which are used in desalination.
2. Fire detection and gas, ionic smoke detectors used with sources of americium-241, ^{241}Am -241, for a total of 450 sources,
3. Detection of analytical components, two sulfur analyzers with X-ray tubes.

The above practices have spent more than 8 years in use with very good results. Radiation protection in the exercise of these was based on the demands and requirements established by law and national legislation in line with the basic rules and guidelines proposed by the IAEA internationally.

At the time elapsed they have not reported overdose of occupationally exposed workers, or specialists and workers related to the exercise of practices, nor have reported incidents or radiological events.

The results are based on training and training of occupationally exposed workers and workers linked to practices in the documentation of each and study and exercise plan radiological emergency linked to other key plans like plan emergency in case of fire and disaster reduction plan.

Training continuity by simple elements such as lectures, conferences, videos, business web, and internal magazines to the entity raise awareness and training of workers in confronting possible events and the responsible use of the potential of the exercise of these practices.

Country/Organization invited to participate

Cuba

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