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smart ideas for wastewater & air treatment

NUCLEANTECH® Laundry

CONCEPT

The objective of this process is to treat the waste water generated in the laundry and staff showers at nuclear facilities. To protect themselves from radiation, staff working within restricted areas use equipment such as safety suits, boots, goggles, masks, gloves, etc. This equipment can be washed for decontamination and later use. The laundry waste water can contain radioactive particles, especially during stoppages of nuclear plants when maintenance work is carried out.

This innovative process enables the water to be treated in such a way that the most part can be reused for washing, thereby saving on water and minimizing its discharge. It involves two treatment lines, that enter into operation depending on whether or not radioactive substances are present. The process was developed with the aim of minimizing the amount of low and intermediate level waste (LILW) produced, thereby guaranteeing the quality and efficiency of the washing.

TECHNICAL CHARACTERISTICS

- Volume reduction factor: over 100 times.
- Radioactivity decontamination factor: practically total elimination.
- Maximum reduction in low and intermediate level waste (LILW).

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PROCESS

This process uses ozone during washing with the triple aim of minimizing the dispensing of chemical products (detergent, whiteners, softeners, etc.), reducing the contaminant load to the maximum due to its high oxidation potential, and guaranteeing a high-quality wash given that the protection material would also come out disinfected. In the case of no radioactivity appearing in the effluent, the treatment process is simple and efficient. In the case of detecting values exceeding 0.02 mSv/year in the effluent, the radioactive species will first be ionized and then held in a mixed bed ion exchange. The reload effluent of the anionic and cationic resins is concentrated in a vacuum evaporator and subsequently a crystallizer, with the aim of reducing the amount of solid waste the must be managed as low and intermediate level waste (LILW) to a maximum.

Gases dissolved in the effluent which contain descendants of uranium such as radon-222 or activated gases like tritium, are sent to the atmosphere after previously passing through a decay tank that guarantees the loss of radioactivity.

APPLICATIONS

The **NUCLEANTECH® Laundry** process has been specially designed for nuclear plants, although it can also be of great use at uranium enrichment and nuclear fuel plants, as well as facilities involved in medicine, metallurgy, research, etc. working with radioactive isotopes.

ADVANTAGES

- High quality and efficiency of washing.
- Waste water reuse with the corresponding reduction in consumption and discharge.
- High reduction in the quantity of produced waste, especially low and intermediate level waste (LILW).
- Exhaustive control of radiation throughout the entire process.
- Flexibility in the treatment regarding fluctuation in quantity, radioactivity and effluent contaminant load.
- Strict compliance with the strictest standards.

PROCESS DIAGRAM