



NUCLEANTECH® UF₆



CONCEPT

The objective of this process is to treat waste water produced by washing equipment used in the synthesis, manipulation and transport of uranium hexafluoride (UF₆) at nuclear fuel preparation facilities. This water contains radioactive particles of low and medium activity and should be treated accordingly. The process is characterized by obtaining high quality water that can be reused in washes and extreme minimization of completely dry solid waste, which must be managed as low and intermediate level waste (LILW). This means that cost saving compared to more conventional processes is quite significant.

TECHNICAL CHARACTERISTICS

- Water extraction: around 80-95%.
- Strong volume reduction to obtain dry solids.
- Maximum reduction in low and intermediate level waste (LILW).
- Possibility of implementation of a zero-discharge system.

PROCESS

In the uranium enrichment process, so that ²³⁵U is found in the suitable proportion in nuclear fuel, two uranium isotopes must be separated. This is achieved in the hydrofluorination of UO₂ to achieve UF₆. The uranium hexafluoride enables the separation of the two isotopes through gaseous diffusion or ultrafiltration. Washing of equipment used in the synthesis, manipulation and transport of UF₆, generates waste water containing remains of uranium, and as a result also transuranic elements derived from natural decomposition. This means that the water contains low and medium level radioactive particles.

The **NUCLEANTECH® UF₆** process enables effluent suitable for reuse to be obtained, by using an evaporator-dryer that operates under vacuum conditions. The solid waste generated is practically dry, and hence its volume is reduced to a maximum, and must be managed according to the nature of low and intermediate level solid waste (LILW). The large quantity of condensed water is reused, both to minimize its consumption and reduce or even eliminate the discharge of liquids in the process.

APPLICATIONS

The **NUCLEANTECH® UF₆** process enables the treatment of waste water generated during the washing of equipment and facilities that manipulate raw material and radioactive products. Although most of cases are nuclear fuel preparation plants, given the versatility of the process, it can also be used and applied to nuclear plants, research laboratories, etc.

ADVANTAGES

- Complete minimization of solid waste of low and intermediate level solid waste (LILW).
- Minimization of water consumption and zero liquid effluent discharge.
- Exhaustive control of radiation throughout the entire process.
- Strict compliance with the strictest standards.

PROCESS DIAGRAM

