

[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment and to be disclosed to public)]

Technology Information	
Area	2 (Select the number from "Areas of Technologies Requested")
Title	Treatment of contaminated water by activated carbon
Submitted by	Tecnubel and DDR Consult in partnership
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p>The objective of this submittal is not to provide a specific process for tritium removal, but to give an alternative, if Tepco is interested, to the issue of contaminated water by a large spectrum of isotopes (excluding Tritium).</p> <p>The process relies on the adsorption of unwanted elements in water by activated carbon in powder. The process is not new, but it is used industrially in a nuclear company in Belgium that we advise, for the purification of radioactive contaminated liquid effluents to free release levels. The attractiveness of the process lies in the very simple utilisation of activated carbon: the industrial application is based on the simple dosing of powdered activated carbon in the storage tanks, followed by some agitation, adsorption time and filtration on standard filter cartridges. Tests in laboratory first showed that activated carbon was effective in reducing the concentration of radioactive elements in effluents to free release levels, and secondly allowed to quantify the amount of activated carbon necessary for our application (see in appendix some examples of lab results performed on the radioactive effluents by various purification methods: precipitation, flocculation, mixed bed demineralisation, activated carbon adsorption).</p> <p>The advantage of the process for Fukushima lies in its simplicity: there is no need for sophisticated purification equipment. Dosing in tanks can be done manually, stirring the effluents in storage tanks can be done remotely by very simple process (air addition, magnets, etc...), and filtration of the activated carbon, which has collected the unwanted isotopes, is done by passing the effluents through an in-line filter housings the cartridges. A pneumatic pump taking suction in the tank by any opening can be used for driving the fluid through the filter (no need of centrifugal pump requiring a minimum NPSH). The filter cartridges are discarded when the dosimetry at contact of the filter housing is attained (teledosimetry) and disposed off as regular combustible waste. The system can be used in a closed loop to purify a tank or in-line when the content of the tank is transferred, for example, in another tank for control before release.</p> <p>We do not know the details of the purification sytem used presently at Fukushima, but we believe that it is worth to communicte our process since it is based on simplicity and could be used at minimum cost for the purification of tanks or sumps.</p>	

2. Notes (Please provide following information if possible.)

- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application):

The technology is used industrially in Belgium in order to purify radioactive effluents to free release levels.

- Challenges:

Relatively high number of cartridges used for a predetermined purification objective. Nevertheless, this disadvantage is offset by the very low cost of the cartridges and the simplicity of the process.

- Others (referential information on patent if any)

【Areas of Technologies Requested】

- (1) Accumulation of contaminated water (Storage Tanks, etc.)
- (2) Treatment of contaminated water (Tritium, etc.)
- (3) Removal of radioactive materials from the seawater in the harbor
- (4) Management of contaminated water inside the buildings
- (5) Management measures to block groundwater from flowing into the site
- (6) Understanding the groundwater flow