

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

Technology Information	
Area	2 – as a necessary pre-treatment to remove any oil and organic substance from contaminated water
Title	Liquid Organic Radioactive Wastes Mineralization Technologies
Submitted by	DEWDROPS
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p>- A biodegradation module for biodegradable wastes with low to mid activity level Input: Biodegradable liquids such as oil, nutrients, water Output: Carbon dioxide, bio sludge Capacity: around 50L oil (around 150kg COD) per day Overall dimensions: 5m x 4m x 4.20m (l, w, h) Operating conditions: Ambient temperature and pressure</p> <p>- A Wet Oxidation reactor for liquid organic wastes with any activity level Input: Oil or bio-sludge, Oxygen or Hydrogen Peroxyde, catalyst, water Output: Carbon dioxide, small alcohols and carboxylic acids (harsher operating conditions eliminate those molecules as well), water Capacity: TBD, around 80kg COD per day per unit (can be adapted as needed) Overall dimensions: TBD, around 2m³ per unit Operating conditions: around 230°C and 40 bar (these conditions can be adapted as needed)</p> <p>- A UV/Ozone module as a follow-up to Wet Oxidation, no limitation on activity Input: UV transparent aqueous solution, hydrogen peroxide Output: Carbon dioxide, trace organics, water Capacity: TBD, around 200g COD per day per unit Overall dimensions: 2m³ per unit</p>	
<p>2. Notes (Please provide following information if possible.)</p> <p>- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)</p> <p>Biodegradation: Well established outside of the nuclear industry (wastewater treatment). Pilot</p>	

scale tests have been carried out on historical oily waste from AREVA's Tricastin site. Needs 2 years for nuclearization to suit Fukushima site conditions.

Wet Oxidation: Also used as wastewater treatment (ATHOS – Veolia) and in the paper industry (Zimpro, Siemens). Pilot scale tested on bio effluent, EHC oil, extension to other organic liquids in hand. Less than 1 year of development for industrial scale nuclear plant. Capable of complete confinement including tritium and carbon 14.

UV/Ozone: Used in public pools and ponds for disinfection and mineralization of low molecular weight organic matter. Also used in the chemical industry for water treatments as well as for drinking water. Already full scale.

- Challenges

Biodegradation: Determine max activity level that bacteria can handle. Needs hot tests.

Wet Oxidation: Optimize operating costs with reduced hydrogen peroxide consumption to and improved catalyst. Reduce gaseous phase to improve confinement and plant size to facilitate nuclearization.

UV/Ozone: Optimize operating conditions to maximize performance.

- Others (referential information on patent if any)

Patent JP2012 506 713

【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