

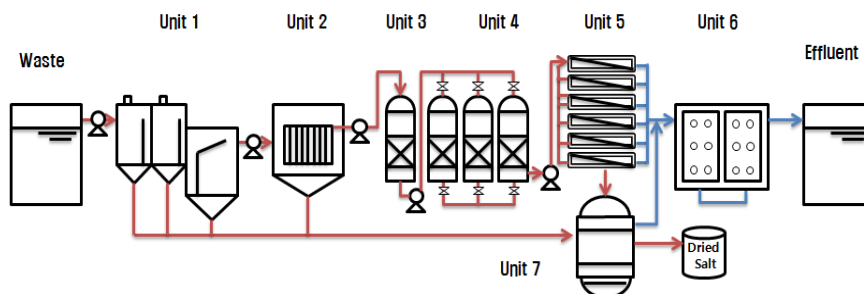
[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment and to be disclosed to public)]

Technology Information	
Area	3
Title	Off-line Liquid Radioactive Waste Processing System
Submitted by	KHNP-CRI
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p>○ Features</p> <ul style="list-style-type: none"> <li>- The system is a trailer mounted mobile liquid radioactive waste processing system.</li> <li>- The system is developed both for the severe accidental liquid wastes and for the abnormal liquid wastes exceeding the operation range of the on-line liquid waste processing system.</li> <li>- The system can process the liquid radioactive wastes with minimum support of the site.</li> <li>- Depending on the wastes, the system could be consisted from five to seven units flexibly including pre-treatment, main-treatment, and post-treatment.</li> <li>- The system could be commercialized at the end of 2014.</li> </ul> <p>○ Specifications</p> <ul style="list-style-type: none"> <li>- Mechanically, the element(s) make up one skid mounted module, and the module(s) make up one unit, and the unit(s) make up one of the off-line system gradually.</li> <li>- Depending on the wastes, the capacity or the performance of the system could be extended by connecting the additional module(s) of the unit having much burden in parallel or in serial.</li> <li>- Basically, the system could be operated on trailers as built. But when radiological shield is required heavily, parts of the system could be erected on the ground for the operation.</li> </ul> <p>○ Functions</p> <ul style="list-style-type: none"> <li>- Due to the high selective adsorbing media adapted to the system, the radio nuclides are removed selectively from the high conductive liquid wastes such as seawater.</li> <li>- A number of KHNP-patented technologies are adapted to the system developed.</li> <li>- Throughput of the system is about 1.5 m<sup>3</sup>/h currently. But it could be extended by connecting the module(s).</li> <li>- The DF of cesium is designed as <math>1 \times 10^6</math> for under the TMI-2 type severe accidental liquid waste representatively. But the decontamination performance of the system is not limited to cesium.</li> </ul>	

- Owner : KHNP Co. LTD.

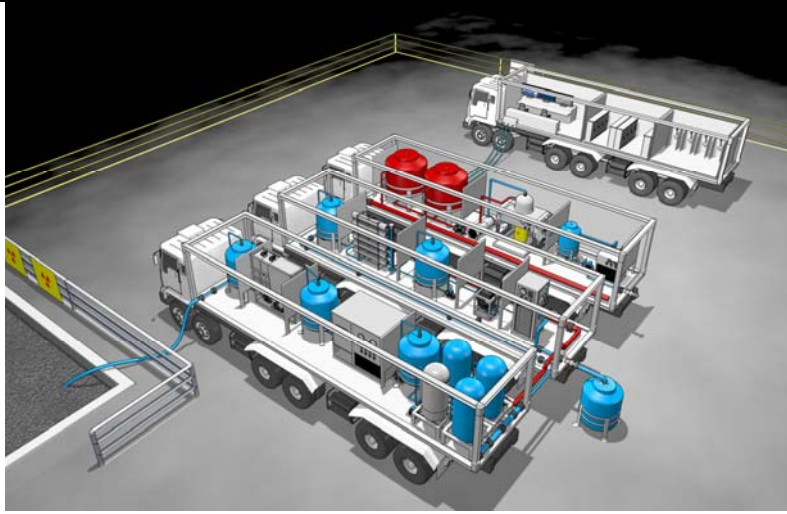
2. Notes (Please provide following information if possible.)

- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)
  - The development of the system could be finished at the end 2014 earlier than scheduled.
- Challenges
  - Actually the tritium removal unit is not included in the system for the moment. Thus, the system can be applied to the tritium-free liquid waste only. However, introduction of a specific tritium separation technology to the system could be realized in a short period of time.
- Others (referential information on patent if any)



Process Configuration of the Off-line Liquid Radioactive Waste Processing System Of KHNP

- Function of Off-line Radioactive Waste Processing System
  - Unit 1, 2 : Pre-treatment of oil and SS
  - Unit 3, 4 : Selective adsorption for Cs, Sr, I radionuclides
  - Unit 5, 6 : Treatment of other radionuclides by membrane and electrochemical methods.
  - Unit 7 : Secondary waste treatment by evaporation and drying System



3D concept of the Off-line Liquid Radioactive Waste Processing System