



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

Technology Information	
Area	5 (Select the number from "Areas of Technologies Requested")
Title	Management measures to block groundwater from flowing into the site
Submitted by	Menard together with Soletanche Bachy, companies belonging to SOLETANCHE-FREYSSINET group (France)
<p>1. Overview of Technologies (features, specification, functions, owners, etc.):</p> <p>From the various meetings with IRID, TEPCO and some Japanese contractors, we understand that there are two cycles of water;</p> <p>(i) The first cycle consists in the water that is used to cool down the reactor. The quantity is known, and the water, which get heavily contaminated, is pumped back and treated, before being used again.</p> <p>(ii) The second cycle consists in ground water that is percolating from the hill north of the installation. The flow is uncontrolled and the water gets contaminated by washing through the contaminated area and partly by mixing with the first cycle water.</p> <p>In order to segregate the two cycles, a solution of a "frozen ground barrier" as close as possible around the reactor is being considered and should be carried out after some preliminary tests confirmed the feasibility. The reason behind the choice of this solution is mainly that the Site is very congested around the building (multiple services to cross) as well as a "self-healing" capacity of the system (cracks in the frozen wall will close) and some inertia (de-freezing of the ground will take some time in case of mechanical breakdown of the brine cooling and circulation).</p> <p>It remains that this system is active: it relies on mechanics and requires regular maintenance, replacement of parts (that will be contaminated) and operation costs will accrued with time. As it is also very close to the installation, it will allow a better control of the "first cycle" of water but will not resolve the "second cycle".</p> <p>For the "second cycle" we propose to carry out a plastic concrete / slurry wall at the toe of the hill plus a gravity drain that will deviate the ground water coming from the hill and get it discharge in the sea, so that the water will not "wash out" the contaminated ground around the installation, thus reducing the quantity of contaminated water to treat.</p> <p>Such containment wall can be done using our "Cutting Soil Mixing / Geomix" equipment and method. It is derived from our "Hydrofraise" equipment and was awarded the Innovation price at BAUMA 2004 and the innovation Award by the French Federation of Public Works</p>	



(F.N.T.P.) in 2007. The main advantage is the speed of execution, and the reduction of spoil.

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

- Technology readiness level:

The CSM / Geomix technology exists already and has been used in several projects, not in the nuclear industry, though.

The preparation of the grout can be done away from the immediate vicinity of the Site and pumped to the cutting head.

- Challenges

1. Adaptation of the grout to the soil conditions (We were informed that the upper layer is sandy, but no information on the characteristics and/or thickness)

2. Remote control of the drilling / mixing operation

3. Compactness of the equipment to fit on the road at the toe of the hill (width unknown)

- Others (referential information on patent if any)

See Brief description of the system and the tool

3.

【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