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

Technology Information	
Area	1, 4, 5, 6 (Select the number from "Areas of Technologies Requested")
Title	Suggestions to control situation Revision 5 Date 10/28/13
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1. Overview of Technologies (features, specification, functions, owners, etc.)

Storage tanks: Stack bags of zeolite around tanks with gap between bags and tanks. Fill gap with polyurethane based foam. Top with screen wire and zeolite bags. Note: It might be wise to reinforce the storage tanks with corrosion-resistant bands and sheet metal for sea water and earthquake protection.

Groundwater flow: Measuring groundwater flux:
www.hydrol-earth-syst-sci.net/10/873/2006/hess-10-873-2006.pdf

Ground water containment: Instead of freezing ground, drill holes around and under. Use fracking drilling methods and/or a trench digging machine for a vertical wall. Insert high nickel anchor rods with hemispherical ends. Insert corrosion resistant vertical sheet (fence). Fill with polyurethane based foam.

Reactor building: Fill entire floor area (except cooling pool) with .08 dia. Lead shot (pellets). And/or fill entire structure with polyurethane foam. This would make the structure more earthquake resistant to further damage. It would vibrate as a solid mass rather than individual elements impacting each other (Ref: Video during earthquake).

Cooling pool: Add pyrolytic carbon spheres coated with SiC (Ref: pebble-bed reactors for graphite moderation). Or maybe Panasonic pyrolytic graphite sheet (PGS) for high thermal conductivity. Maybe sheet could float on cooling water and then lower water level to coat rods with PGS film? See attached sketch photo of PGS cover that could be lowered over rods.

Note: Prior to any of these actions, apply a layer of powdered graphite to seal small cracks and/or a layer of silicon carbide SiC powder for a diffusion barrier. Molybdenum disulfide powder (specific gravity 5.6 – 4.8) might seal better, but might be chemically affected by sea water.

Resulting compound could enhance sealing. And/or

- Epoxy pond liner
- Liquid rubber
- Polyurea spray on pond liner, elastic, flexible, abrasion & puncture resistant
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2. Notes (Please provide following information if possible.)

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

Foam: www.dowgreatstuff.com This would require an appropriately sized pressure tank and pipe work to apply. Space to be filled may require blow drying (not sure).

Lead shot: Used in shot gun shells. Specific gravity 11.3

Graphite: Chemically inert, specific gravity 2.2-2.3 powder form or maybe amorphous graphite.

Pyrolytic graphite: specific gravity < 2.1

Silicon carbide: specific gravity 3.1

PGS: specific gravity 0.85 to 2.1 g/cm3

Molybdenum disulfide powder: specific gravity 4.8-5.6

Liquid rubber: www.koienterprise.com

Polyurea Dragonkote: elastic, flexible, abrasion & puncture resistant, 4000 psi tensile

www.durablecoatingsystems.com

www.upscalecoatings.com

- Challenges
  1. Proactive management of cooling pool. Methods to apply.
  2. Safe and controlled access to facility. Need a crane with 3 axes control to penetrate

structure at specified coordinates and apply materials where needed.

3. Systemic response rather than individual isolated responses.
4. Real time report on current system status at key location points (temperature, etc.)

- 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