

Sea Discharge Tanks

Neutralised effluent overflows out of the second stage neutralisation tank by gravity into either of the two sea discharge tanks. These tanks each have a working capacity of 550m³ and operate on a batch basis. Effluent will normally be discharged continuously from the neutralisation system into one of the sea discharge tanks. During filling of the tank a representative bulk sample is taken, this is the "A" sample. The sampled sea discharge tank is allowed to stand for at least two hours to enable settling of any solids before discharge. Analysis is carried out on the "A" sample and authorisation is required by the Shift Manager prior to discharge to sea. During discharge to sea a further "B" sample is taken as required by the regulatory authorities.

Control and Instrumentation

Control of the plant systems is carried out by microprocessor-based controllers. A Distributed Control System (DCS) allows operating staff to control the plant remotely using keyboards and VDUs. These systems are linked to the D1208 Control Room via telemetry. Plant operators also take routine readings of the ventilation system and other systems.



Part of the control suite.

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Low Level Liquid Effluent Treatment Plant

Low Level Liquid Effluent Treatment Plant Dounreay



What is LLEETP?

The Low Level Liquid Effluent Disposal Plant (LLEETP) is used for the collection, treatment and disposal of Low Level liquid effluent from the Dounreay and Vulcan sites. The facility, built between 1998 and 2001 at a cost of £7.5M, replaces the D1211 Effluent Plant constructed in the 1950s.

In the summer of 2003 the Scottish Environment Protection Agency (SEPA) authorised UKAEA to commence active commissioning of the plant.

How Does It Work?

Effluent from the Low Active Drain system flows into the gravity receipt/solvent separator tank. The tank is below ground level to allow effluent to flow continuously from drain lines by gravity. Effluent arrives periodically from PFR, Vulcan, Fuel Cycle Area and other sources.



Low Level Liquid Effluent Treatment Plant.



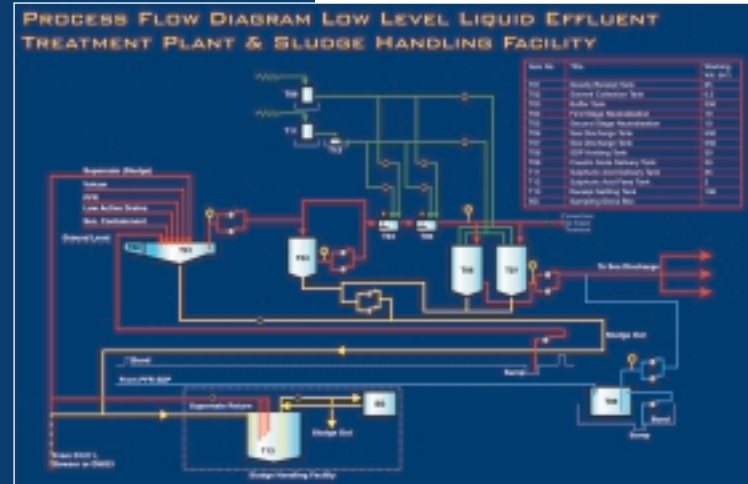
Manual adjustment of process.

The Process

The gravity receipt solvent separator tank is sized to separate solvent from the incoming effluent. This is done by reducing the velocity of the effluent thereby allowing the solvent to rise to the surface.

Suspended solids within the incoming effluent lines will settle in this tank due to the low velocity. The solvent will be removed periodically from the top of the effluent by gravity into a solvent collection section. The solids/sludge collected at the bottom of the tank can be removed as determined by readings from the sludge concentration-detecting instrument in the bottom of the tank. Flushing water is supplied to the tanks in order to facilitate sludge removal. It is estimated there is 10 years of sludge storage space in these tanks and one option for the future treatment of this sludge is to cement it and release it as Low Level Waste.

From the Gravity Receipt Tank (GRT) the Effluent is transferred to the buffer tank which has a capacity of 300m³. It is then passed through a two stage neutralisation plant in order to control the pH of the effluent which is to be discharged to sea (the effluent enters the plant with a discharge between 2 to 12 and leaves the neutralisation plant with a pH between 5 and 9). Adjusting the pH of the effluent, reduces the impact on the environment and meets the latest discharge criteria.



External equipment.