The storage of Liquid High Level Waste at Sellafield: Key issues for NII

1. How does the NII intend to deal with the backlog of High Level Liquid Waste at Sellafield? Is BNFL going to be required to act as quickly as possible?

The Advisory Committee on the Safety of Nuclear Installations (ACSNI) recommended in 1992 that Highly Active Liquid (HAL) waste should be vitrified (incorporated into glass blocks) as soon as reasonably practicable. BNFL told NII in 1995 that it aimed to reduce HAL stocks to a buffer volume by about 2015.

If the NII accept BNFL's date what justification does it give for not going beyond what BNFL already aim to do? How does the NII define "as soon as reasonably practicable"?

The NII report will talk about the need for "...the minimization of the amount stored [High Level Liquid Waste]" in order to "reduce the hazard potential".

The NII report is expected to recommend that:- "BNFL should address the issue of passive safety within the new (1999) safety case, to show what modern standards would be, then justify why modification towards this standard is or is not reasonably practicable"

Why is the NII not forcing BNFL to suspend reprocessing operations until BNFL reduces its stock of High Level Liquid Waste to a buffer volume? Why should the public be forced to wait 15 years before the "hazard potential" is reduced?

2. How will the NII monitor BNFL's progress towards meeting the 2015 deadline?

The NII report, whilst nowhere giving a justification for its arbitrary date of 2015 for reduction of stocks to a buffer level, will say that BNFL has "not provided adequate confidence that the reduction in HAL stocks to a buffer stock by around 2015 will be achieved". NII is seeking to agree milestones with BNFL

If BNFL begins to fall short of the deadline, will the NII take action to suspend reprocessing until High Level Liquid Waste has been reduced to a buffer volume? If the NII is already doubtful that BNFL will meet the deadline, why doesn't it take action now?

The performance of the Waste Vitrification Plant (WVP) is crucial to any high-level liquid waste reduction timetable. The WVP continues to experience operational difficulties with respect to achieving the desired

production rates and the building of a third WVP process line is currently running late.

How confident is the NII that BNFL will be able to increase the rate of vitrification, and that the third vitrification line can be completed soon? How confident is the NII that the third line will not experience the same problems as the first two?

3. Maintaining the cooling of the High Level Liquid Waste Tanks is the key safety issue. How concerned are the NII about the possibility of a prolonged loss of cooling accident?

High Level Liquid Waste generates its own heat. Heat generation varies from about 20 - 460 kW per tank from Magnox fuel to around twice the higher figure for oxide fuel (AGR; PWR; BWR). The total volume of High Level Liquid Waste in store in October 1999 was about 1300 cubic metres.

The NII report will say the High Level Liquid Waste tanks do "not represent what would currently be considered best practice with passive safety features that would be commensurate with the high hazard potential of the plant." In other words the tanks require continuous human intervention in order to maintain safety.

Some of the High Level Liquid in the tanks would boil after around 12 hours if there was a total loss of cooling as a result of, for example, a power cut.

Power supplies were cut at the Dounreay reprocessing plant for 16 hours on 8th May 1998. The disconnection occurred when an excavator severed a cable and the emergency power supply, designed to avoid a loss of cooling to the high level liquid waste tanks, failed to work. The NII shut down the entire fuel cycle area at Dounreay following the incident.

Why do we have to wait for a near miss before the NII acts?

4. What would be the consequences of a total loss of cooling to the High Level Liquid Waste Tanks?

In the event of the High Level Liquid Waste boiling the amount of fission products released into the environment would depend on a number of factors such as duration of boiling, the number of tanks involved and the extent to which fission products were removed by the ventilation system filters. The consequences would depend on other factors such as wind direction and the weather.

In a 1998 report for the General Council of Irish County Councils and the UK Nuclear Free Local Authorities, Gordon Thompson of the Institute for Resource and Security Studies said:-
"The Sellafield HLW tanks represent one of the world's most dangerous concentrations of long-lived radioactive material ... a suspension of reprocessing would allow the backlog of liquid HLW to be converted to glass by 2007 ... the long-term consequences of a HLW tank release could be much more severe than the consequences of a reactor accident".

Gordon Thompson will be available for comment on Friday afternoon (UK time) 18th February. (Tel: 001 617 491 5177)

The inventory of radioactive Caesium-137 in the Sellafield High Level Waste Tanks is 30 times the amount in the Chernobyl reactor core.

5. What are the NII's Safety Concerns?

Because the High Level Liquid Waste Tanks are not "passively safe", BNFL's safety case for the operation of the tanks is of paramount importance. The NII is expected to identify serious deficiencies in BNFL's safety case.

The NII report will say:-
"Particular concerns of NII are that the current B215 [the High Level Liquid Waste Tanks] safety case is not comprehensive in its coverage of faults, does not consider all faults in sufficient detail, does not identify in a suitably robust manner the important safety related systems and procedures required to define the safe operating envelope, gives inadequate assessment against modern standards and does not provide an adequate demonstration of ALARP".

Containment is the other important safety issue. NII says BNFL's remote inspections of the tanks to establish component corrosion rates have not been conclusive and cannot confirm the assumptions made in the safety case.

Conclusion:

The HLW tanks at Sellafield represent one of the world's most dangerous concentrations of high level radioactive waste. The NII has failed to justify choosing the arbitrary date of 2015 to reduce the "potential for harm to as low as reasonably practicable". There are too many question marks hanging over BNFL's Safety Case and the integrity of the High Level Liquid Waste Tanks. The NII is already concerned that BNFL will miss the 2015 deadline. Why wait? The NII must act now and order an end to reprocessing.