Nuclear Free Local Authorities briefing

'Spent' (used) nuclear fuel is transported by rail across the country from nuclear power stations to the British Nuclear Fuels (BNFL) waste reprocessing and storage complex at Sellefield in Cumbria. (Nuclear stations without rail links transport by road to the nearest railhead. See Annex.)

Community concern about the safety of transporting spent nuclear fuel arises because of (a) the radiological risks from accidents or malicious damage imposed on people living near rail routes; and (b) the continuing uncertainty about the health implications of chronic exposure to very low levels of radiation. Such exposures can arise from either surface contamination or routine radiation penetration of spent fuel transportation containers (flasks) by the highly radioactive spent fuel elements held inside.

In recent years concern about nuclear transportation has heightened in the wake of a number of serious accidents on the rail network. This concern is likely to be compounded by BNFL's recent decision, reported last month, to increase transport speeds from a maximum 45mph to 60mph – twice the speed of a nuclear fuel flask impact test (see below).

Transport Safety

Transport regulations give effect to an EU Directive which in turn gives effect to the International Atomic Energy Agency's *Regulations for the Safe Transport of Radioactive Material*. The philosophy of the IAEA Regulations is that safety is built into the specification of transport containers regardless of the mode of transport. Each container must be capable of withstanding a) a 30mph impact test, b) a 30 minute/800 centigrade fire test, and c) a 15 metre/8 hour submersion test. These three tests - for impact, fire and submersion - have been frequently criticised as inadequate individually or cumulatively.

For example, at the Sizewell B Public Inquiry the Town and Country Planning Association drew attention to the issue of sabotage. It is understood that anti-tank weapons available today could easily penetrate a transportation flask, being able to penetrate through 1 meter of steel, at a distance of 1 km.

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The State of Nevada has evaluated the consequences of a successful terrorist attack against a flask. The analysis found that the release from a successful terrorist attack, assuming 90% and 100% penetration of a flask, could produce 2.3 to 26.7 latent cancer fatalities. It believed even more severe attack scenarios and even greater health consequences to be credible. Nevada also estimated the economic impacts of a successful terrorist attack and estimated cleanup costs and other post-incident economic impacts between $500 million to $7 billion.

The US State of Nevada has also evaluated the radiological health consequences of a severe accident involving a large rail flask. The analysis found that the release from a severe rail accident in an urban area could result in 72 to 540 latent cancer fatalities. It also concluded that the economic impacts of cleanup and other post-accident costs in an urban area would range between $9.4 billion and $270 billion.[1]

In the US flask testing is more rigorous. Current US tests require 6 tests, the first five applied sequentially:

- Impact: 30 ft onto an unyielding surface
- Crush: the drop of a 500 kg (1100 pound) mass from 30 ft onto the specimen
- Puncture: free drop from 40" onto a 6" diameter pin
- Thermal: 30 minute engulfing fire at 800 degrees C
- Immersion: immersion under a head of water of at least 0.9 m (3 ft)

A separate test involving the submersion of an undamaged cask 50 feet under water for 8 hours.

Emergency Planning

Plans must be drawn up for 'reasonably foreseeable' accidents that may require urgent response, whether predicted to be severe or not. If a hazard assessment shows that an accident causing a radiation dose of 5 millisieverts (mSv)[2] to a member is reasonably foreseeable, then the employer must also prepare a contingency plan for such an event.[3]

The newly implemented *Radiation (Emergency Preparedness and Public Information) Regulations* (REPPIR) *2001* requires the public, who may be affected by a reasonably foreseeable accident, to be provided with pre and post accident educational information. This information is not provided to the public living beside spent nuclear fuel rail routes because the Health and Safety Executive do not consider any accident resulting in an annual radiation dose exceeding 5mSv is 'reasonably foreseeable'.

One of the important aspects of REPPIR is that it will for the first time impose on local authorities duties to prepare, test, and, if necessary, implement off-site emergency plans for fixed sites. However there is no equivalent obligation on local authorities with rail transport corridors carrying radioactive materials to prepare emergency plans for accidents in such corridors. HSE has judged that there is no need (or presumably merit) in local authority planning for such accidents as they are not 'reasonably foreseeable'.

The NFLAs have consistently criticised this concept of 'reasonable forseeability', and argued that planning should also encompass accidents that are 'reasonably possible' and have

[1] see http://www.state.nv.us/nucwaste/news2000/nw000921.pdf , p6

[2] Note that a dose in excess of 1 mSv is unlawful and we question the legality of a criterion set at five times this dose.

[3] Regulations 26 and 27, and Schedules 2 (column 6), 7, 8 and 9, of Ionising Radiations Regulations 1985 (as saved by Regulation 41 Ionising Radiations Regulations (IRR99)).

significant consequences. This would ensure that planning was undertaken for less likely accidents which nonetheless have the potential for significant harm.[4]

Accident Compensation Uncertain

Compensation is payable where an occurrence involving nuclear material in transit causes injury (i.e. physical injury or death) to any person or damage to any property (sections 11 and 12 Nuclear Installations Act 1965). Liability is channeled exclusively to the operator of the nuclear site from where the spent fuel came, whether or not anyone else would otherwise have been liable, and is limited in amount (£280 million guaranteed maximum, the first half from the operator, the second from Government) and time (claims must be lodged within 30 years from the incident). The right to compensation arises without the need to show negligence but legal difficulty arises in showing:

- that the injury or damage was in fact caused by the occurrence, rather than any other source of carcinogens;

- that the effects complained of amount to injury or damage.

Compensation does not cover purely economic loss (e.g. loss of trade, fall in value of stock etc., unless this is consequent on a specific claimant's prior proven injury or physical damage), preventative action, clean up costs, psychological impact or neighbourhood blight consequent on popular but unproven perceptions of damage to the reputation of a locality, property prices, commercial vitality etc. An accident in an urban area could be devastating in impact without any liability for most of the financial impact arising or being proven in law. The maximum amount of c£280 million can be compared with estimates of the cost of Chernobyl of £200,000 million.

Stopping Transports

Both the possibility of an accident, sabotage or routine contamination need not be contemplated if the transport of spent fuel is stopped. The NFLA view is:

- there is no need to send spent AGR and PWR fuel to Sellafield: reprocessing is not required and is unwise on economic and environmental grounds and certainly not considered essential by the power station operators;

- Magnox spent fuel is technically capable of being dry-stored, which would avoid the need to reprocess it; however the conventional wisdom is that it does need reprocessing. Nonetheless, it is the NFLA Steering Committee's view that the continuation of the operation of Magnox power stations is uneconomic in any event and they should be closed. Part of this view rests on the cost of the necessary refurbishing of the Magnox reprocessing plant (B205) at Sellafield and on the cost of abating its waste discharges to sea (to meet international obligations).

Notes

1. This paper is based on evidence submitted by the NFLA Legal Adviser to the Greater London Authority inquiry into rail movements of nuclear material through the Capital. For copies of the Legal Adviser's submissions contact the NFLA Secretariat.

2. The following annex is reproduced from *Freightmaster* Ed: Mark Rawlinson, Edition No.22, July-September 2001, ISSN 1357 - 4841.

[4] It is particularly poignant to make this point after the Selby rail accident.