dti

21 July 2006

The Rt Hon Alistair Darling MP
SECRETARY OF STATE
FOR TRADE AND INDUSTRY

Helen Bjørnøy
The Minister
Royal Ministry of the Environment
Myntg 2
PO Box 8013
N-0030 Oslo
Norway

Your ref: 200504437/-FJT
Our ref: AT/586420

Dear Minister.

Thank you for your letter of 7 June to David Miliband about THORP. I am replying as the matter you have raised falls within my Department's responsibility.

I well understand Norway's legitimate interest in nuclear activities that might affect Norway's own territory or waters. The safety of UK nuclear facilities is, of course, very important to our authorities. We have, as you know, stringent processes in place with independent checks at every step, precisely to ensure maximum safety.

I am pleased that you found the visit by the Nuclear Decommissioning Authority useful. You raise, however, the issue of reopening THORP following an incident last year. The NDA have considered the consequences of both restarting and not restarting operations at THORP. They have published a paper on their website outlining their conclusions. I enclose a copy. This analysis indicates that the environmental impact of the range of options is broadly neutral; and the impact on waste volumes is also minor when compared to the currently predicted arisings from the UK clean-up programme.

Department of Trade and Industry

1 Victoria Street
London
SW1H 0ET

Direct Line +44 (0)20 7215 5000
Fax +44 (0)20 7215 5329
Minicom +44 (0)20 7215 6740
Enquiries +44 (0)20 7215 5000
www.dti.gov.uk
dti.correspondence@dti.gsi.gov.uk

Before THORP can restart, a safety case will have to be made to the independent Nuclear Installations Inspectorate (NII). A restart would be permitted only when the NII has been satisfied that its safety requirements are met. Considering the available options, THORP is expected to restart, but the NII will, quite rightly, take whatever time it needs in order to be satisfied that safety concerns have been addressed.

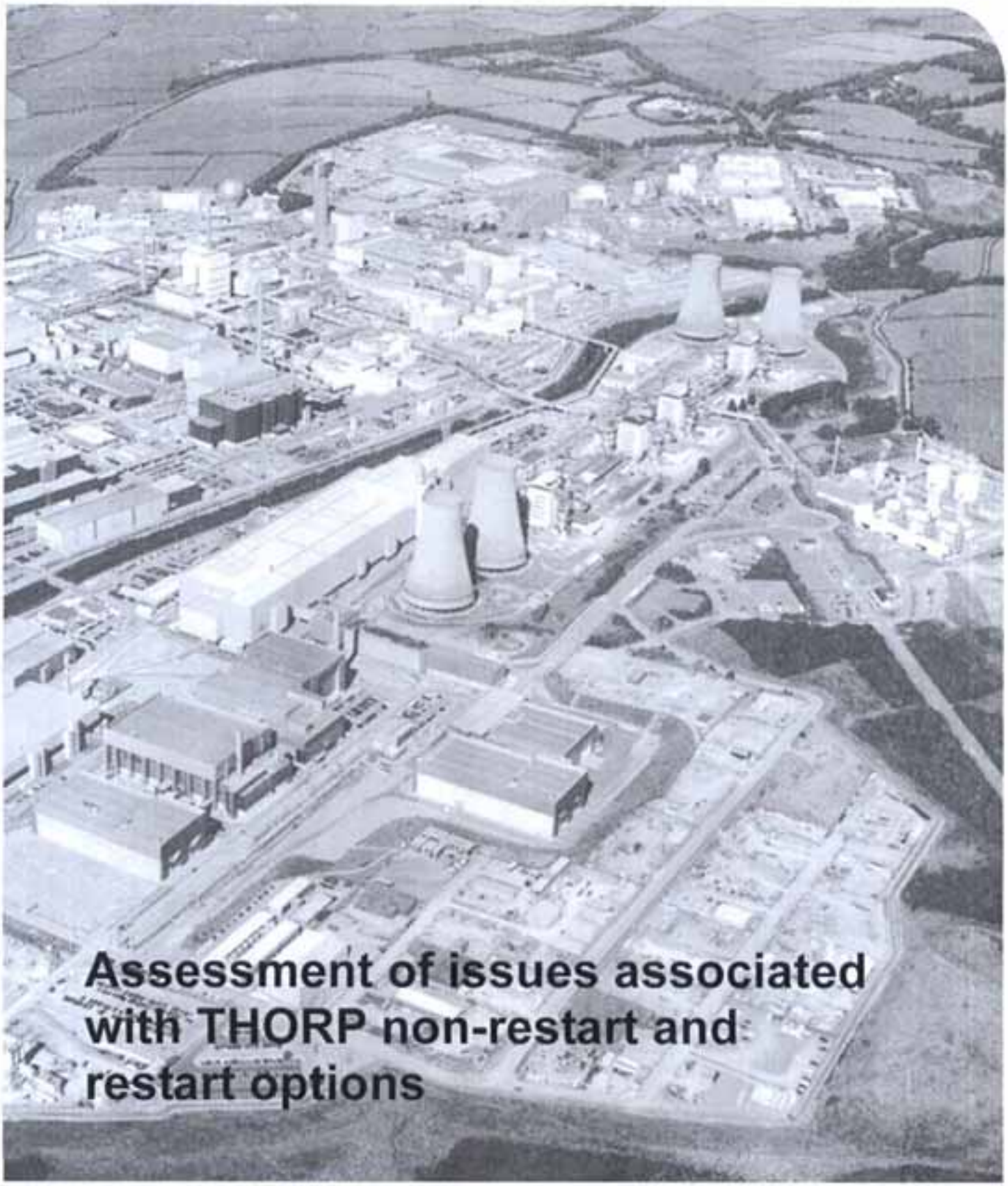
The Health and Safety Executive's NII will continue to keep the Norwegian Radiological Protection Authority fully informed of developments regarding THORP.

The interests of neighbouring countries such as Norway are taken into full account in all issues concerning the safety and security of nuclear installations.

If you or your officials need any further information we would be happy to provide it.

Yours sincerely

ALISTAIR DARLING



Assessment of issues associated with THORP non-restart and restart options

NDA
Nuclear
Decommissioning
Authority

Introduction

In April 2005 the Thermal Oxide Reprocessing Plant (THORP) at Sellafield in Cumbria was shutdown following the detection of a fractured pipe in one of the heavily shielded cells in THORP known as the feed clarification cell. Investigations were carried out by British Nuclear Group Sellafield Limited (BNGSL) and the nuclear safety regulator, Her Majesty's Nuclear Installations Inspectorate (NII) and recommendations have been made to prevent similar failures in the future. As a result of its investigation, NII has to date placed 49 actions on BNGSL before the plant will be allowed to restart operations.

NDA also has a responsibility in the restart of THORP and hence the BNGSL programme for responding to the incident has been routinely monitored and reviewed by NDA. This report considers the major factors that will be taken into account when deciding whether or not the plant should be restarted.

It should be noted that BNGSL has approval by the Government to use THORP for reprocessing nuclear fuel to complete existing overseas and UK contracts. Any new contracts would need to be approved by Government, following a public consultation. Also, THORP, as part of the Sellafield site is licensed to operate by NII and the Environment Agency. Therefore THORP will remain shutdown until NDA is satisfied that its interests have been met and NII is satisfied that the plant is safe to restart operations.

Summary of incident

THORP operations were stopped because of a failure of a pipe which fed centrifuged dissolver liquor into an accountancy tank. This pipe formed part of the primary containment of the radioactive liquor. The failure, which was due to metal fatigue induced by excessive pipe work displacement, caused the primary containment to fail and resulted in the spillage of a large quantity (estimated to be 83.4m^3) of this highly radioactive and corrosive liquor into the secondary containment. Some damage was done to the accountancy tank support structure. No other part of the plant was affected. The BNFL Board of Enquiry Report on the incident may be viewed at www.britishnucleargroup.com/pdf/2765_1.pdf

Analysis of options

A range of non-restart and restart options have been assessed which considered the operational, environmental, and financial and policy aspects in detail. The key issues are discussed below:

Issues associated with non-restart options

If THORP were not to restart operations then a number of issues arise. At present THORP is scheduled to fulfil a number of overseas Light Water Reactor (LWR) fuel contracts and British Energy (BE) Advanced Gas-Cooled Reactor (AGR) contracts.

Not restarting THORP would mean that the fuel belonging to foreign customers would either have to be:

- retained in the UK and the appropriate amounts of plutonium, uranium and waste provided to overseas customers from existing UK stocks – this is sometimes referred to as "virtual reprocessing"
- returned to its country of origin
- sent to an overseas third party to be reprocessed.

Virtual reprocessing would represent a departure from current government policy, and the terms of the reprocessing contracts. The NDA consider that the adoption of virtual reprocessing in an appropriate timescale is not credible. Due to the policy, regulatory and commercial complexities involved it is considered that it would take several years to develop and implement this approach.

The remaining two options would require complex modifications to the THORP Receipt and Storage pond to export the fuel currently being stored and require extensive external transport arrangements, which could interfere with the schedules for repatriation of the products and wastes from overseas fuel already reprocessed. It is considered that establishing such arrangements would take significant time and would be very costly, estimated to take between 5 and 10 years and cost the order of tens of millions of pounds. In addition, the costs associated with returning fuel or arranging third party reprocessing and cancellation/modification of contracts would fall to the NDA.

BE contracts require that BNGSL receive all spent AGR fuel arising during AGR operations, including from any station lifetime extensions. The non-restart option would impact on the flexibility to deliver BE contracts and, although still manageable, would ultimately result in the need for storage of increased quantities of AGR fuel at Sellafield. There are technical and logistical issues associated with this approach such as storage location and pond conditions.

It should also be noted that an appropriate safety case for long term storage of fuel would have to be made and implemented on shorter timescales than currently envisaged.

Issues associated with restart options

For all restart options the following common questions must first be answered.

Can the plant be reinstated to an operational condition?

BNGSL has evaluated a number of options for bringing the plant back into operation. The currently preferred option is to make use of the undamaged accountancy tank for future operation. This would reduce the plant throughput compared to that previously achieved, whilst still enabling delivery of existing customer contracts, and require modification to some operating procedures and instrumentation. BNGSL is developing plans to look at the options for repairing and making use of the damaged accountancy tank. NDA is monitoring and

reviewing the technical reinstatement activities. BNGSL will also need to satisfy Euratom regarding any revised safeguards arrangements.

Will it be safe to restart the plant?

BNGSL believes that it is possible to make a safety case for the use of the plant using only one accountancy tank. The NII will assess the adequacy of the case, and acceptance of the Safety case is a fundamental requirement for a restart.

Can BNGSL comply with its own and NII conditions for a restart?

BNGSL is executing an extensive programme to address all the issues identified in their own investigation and the requirements identified by NII. BNGSL has indicated it is confident that it will be able to successfully address all the requirements that have been identified as being necessary for the restart of the plant. NDA is again monitoring BNGSL progress in delivering their programme.

Can the NDA be satisfied that its conditions for restart have been met?

NDA conditions for restart are that

- it is satisfied that the recommendations identified in the BNGSL Board of Inquiry into the THORP event have been addressed satisfactorily
- BNGSL has obtained NII acceptance of the restart safety case
- a robust case exists to show that the integrity of the plant is sufficient to enable the completion of existing orders
- an economic case can be made, based upon satisfying existing customer contracts.

NDA believes that there is a reasonable prospect that these conditions will be met, but more work is required before it can be sure. NDA continues to engage with BNGSL to resolve these conditions.

Comparison of restart and non restart options

The assessments carried out have examined both financial and operational aspects and raise a number of issues for both restarting and not restarting THORP. Whilst the duration of operations after a potential restart affects the detailed outcome of the analysis, the fundamental issues associated with restart are common to all options.

This analysis indicates that the environmental impact of the range of restart and non-restart options is broadly neutral, and the impact on waste volumes is also minor when compared to the currently predicted arisings from the UK cleanup programme (see table below).

	Complete LCBL plan	Do not restart the plant	Comments
Lifetime Aerial Discharges (micro Sv)	38	0	Compared to annual collective dose of 2200 micro Sv from background
Lifetime Liquid Discharges (micro Sv)	5	0	Compared to annual collective dose of 2200 micro Sv from background
Date for HAST emptying	2015	2012	
Spent fuel for disposal (te)	~4000	7000-8000	Single pond storage for "complete LCBL plan"
HLW canister for disposal	~6250	~4900-5300	All options can be managed within existing store assuming export of overseas vitrified residue
ILW drums for disposal	~9600	~4500	Compared to lifetime UK arising of some 200,000 drums
Employment man years (relative)	-	-4000	Redeployment of these resources would need to be managed

Both options require safety case development and implementation.

The restart option enables discharge of existing contracts within current UK government policy and existing contract terms. For the different non-restart options, there are a range of potential commercial outcomes, which it is estimated could result in the loss of revenue to the NDA of some several hundred million pounds.

Conclusions

There are significant cost implications in a decision not to restart THORP, driven by the commercial implications of existing BE and overseas LWR contracts. These costs are provisionally estimated to be in the order of several hundred million pounds. These costs would have to be met by the NDA and would be likely to prejudice the cleanup programme.

A number of mandatory regulatory, BNGSL and NDA requirements must be met to enable a restart to be considered.

Separately from the considerations of potentially restarting THORP, NDA is planning to launch a comprehensive long term spent fuel management review in April 06 which will look at all the options for UK spent fuel including reprocessing, ongoing wet storage, dry storage in new purpose built stores and dry cask storage. The future role of THORP in managing spent fuel will be considered as part of this review.