



## Reprocessing Australia's high level nuclear waste

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Before joining Greenpeace he was a consultant researcher, educator and campaigner. He was involved in the Jabiluka campaign and the campaign against the Port Kembla copper refinery. He also specialised in human rights issues and worked extensively in areas of criminal justice, including mandatory sentencing, zero tolerance policing and public space. He has worked for the University of Technology Sydney, the Youth Justice Coalition, the Community Legal Centres of New South Wales, and was convenor of the National Youth Advocacy Network.



## Reprocessing Australia's high level nuclear waste: Stage managing waste 'solutions', controlling political backlash

### ***Summary:***

Successive Australian governments have dealt with the political and environmental problems of high level nuclear fuel waste, arising from their past, present and proposed reactor operations at the Australian Nuclear Science and Technology Organisation, via the option of transporting spent fuel overseas for reprocessing. This is however a contingent strategy. This policy is driven largely by a desire for extending Australia's involvement in the nuclear world, but it will continue to be buffeted by the demands of international and domestic politics. This paper examines the political and ideological conditions surrounding this issue as they exist in this country in August 2000, particularly in the context of the decision of the OSPAR commission in June.

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### ***Introduction***

Although it is misusing a well worn cliché, it is fair to state that the current federal government has too many nuclear balls up in the air. It is attempting to drive a new nuclear agenda, and to impose it on an Australian community that extensively, and quite reasonably, doesn't want any part of it. It is trying to impose a new reactor and new nuclear waste dumps, and to shy away from robust diplomacy in relation to nuclear proliferation and nuclear weapons. It is pursuing some of these goals using smoke and mirrors, by playing a precarious percentage game of duplicity with the Australian public. It wants this expansion, whilst trying to convince the Australian public that everything is taken care of: the nuclear version of relaxed and comfortable. In order to explore some aspects of this complex web this paper concentrates on the government's continued use of the overseas reprocessing strategy for spent fuel.

For many years past, and in the present, Australian governments have sent the spent nuclear fuel produced in this country overseas for reprocessing. This is a fundamentally improper policy, on environmental, economic and scientific grounds. So why has this strategy been pursued? Whilst those who have made this decision believe that science will find an ultimate solution for waste, it is essentially a policy that has been pursued for political reasons. Australian governments, have decided that it is preferable to move this high level waste offsite from Lucas Heights and to subject it to a polluting, expensive and unnecessary process, than to store the waste on-site and face the quite reasonable ire of the Sydney community. Furthermore, it wants to continue to do so for many years more.

However, the window that exists for continuing this strategy is closing. The world is waking up to the problems inherent in reprocessing: radioactive discharges and emissions, dangerous spent fuel and waste transports, and the separation and quite staggering stockpiling of vast quantities of plutonium. The OSPAR decision of June 2000, is a key mile stone in the history of this debate. It irrevocable reverses the waste-producing countries' assumption that reprocessing is a sensible option. Further, this decision will have ramifications for Australia's nuclear aspirations, because Australia sends its spent fuel to Europe where this intellectual shift is occurring.



## ***Section 1: Spent nuclear fuel from Lucas Heights***

There are currently three different public strategies for spent nuclear fuel arising from the HIFAR reactor.

First, spent fuel rods of US origin are being returned over time to the States for dry storage. To date, 240 rods of US origin have been sent back to America.

Secondly, In 1963 and 1996, shipments of spent fuel rods have been sent to Dounreay in Scotland for reprocessing. To date 264 fuel rods have been shipped to Dounreay, but this option has now closed and no further shipments are likely to take place.

308 fuel rods have been sent to the notorious La Hague reprocessing plant in France. This paper will return to the issue of pollution and discharges from the La Hague plant. The waste arising from these spent fuel rods are due for return by 2015.

It is most important to note that all the waste arising from reprocessing at Dounreay and La Hague will return to Australia over time.

Thirdly, over 1000 highly radioactive spent fuel rods are currently being stored at Lucas Heights. All of these are targeted for overseas destinations at some time in the future, including some to be returned to the US and others earmarked for reprocessing in France.

There are 565 fuel rods due for shipment.

However, there is one other unstated policy that the government has been working towards, which could be unveiled, and brought into play at any time.

This is the possible, yet politically dangerous strategy of leaving the spent nuclear fuel at Lucas Heights, perhaps incorporating some kind of conditioning process.

However, there are really two sets of spent fuel rods that we could be discussing here. First, there is the legacy waste, the rods currently stored and the remaining fuel rods to be fissioned in the old HIFAR reactor before decommissioning. Secondly there is the speculative, theoretical fuel rods that would be used in the hypothetical reactor that has not been built.

Information obtained in parliament reveal that the plan for the new reactor will be to use a silicide fuel for an interim period (probably at least two years), and a uranium-molybdenum fuel for subsequent years. There are significant questions in relation to how these arrangements affect spent fuel management, especially as reprocessing of the silicide fuel is difficult, and the process for molybdenum fuel has not been determined.

The use of these new (and in the case of molybdenum fuel: undeveloped) fuels also has significant ramifications for the current process for licensing the old facilities at Lucas Heights. The use of these new fuels will require changes to operations and safety procedures and also to fuel handling and storage procedures. It appears that these questions are not to be addressed during the current licensing round. The question is why shouldn't we deal with this issue sooner than later?

Whilst this development has come to light after the licensing process began, the process and outcomes from the process will be severely compromised if the new information is not taken into account.



If Australia is to truly look towards its nuclear responsibilities, the government should pause whilst the implications of new fuel types are fully understood by ANSTO, ARPANSA and the general public. This information must be incorporated into the information supplied by ANSTO and the public given time to react to it. The government and ANSTO should come clean on their full life-cycle plan for the fuel for the new reactor. But once again it is hedging its bets.

## ***Section 2: The political imperatives driving the reprocessing option***

### **The “need” for a nuclear capability**

The Government is being driven towards establishing a new reactor (and thus continuing with reprocessing), and the need for a waste facility some where in the Australian outback, by its ideological drive towards retaining a nuclear capability in the "national interest". This includes the retention of a reactor research capability, diplomatic status and ensuring Australia's nuclear based interests which covers things ranging from the US alliance to uranium mining. Unfortunately this is pursued without looking at any of the available alternative choices.

One of the great areas of concern in the politics of the nuclear industry is the 'imperatives' that drive those who work and rely on the industry that the nuclear choice (or at least reliance on reactor technology) makes good 'common sense'. In fact, the 'common sense' that runs the industry both economically and politically is a received common sense, a blinkered common sense, one that is confined within one small area of intellectual thought in relation to broad questions about science, economics and society. This common sense is based on a singular set of interpretations, rationalities and choices.

In Australia the nuclear agenda is largely driven by politicians, scientists and bureaucrats who still believe in the myth that science can rationally deal with any problem, that there is such a plausible thing as the 'peaceful use of the atom', and that a nuclear capability is central to safeguards work and disarmament research. It is also driven by a Federal agency, ANSTO, which is so entrenched in its thinking that it cannot see that alternatives are available which could not only revitalise its portfolio of technical capabilities, but could see its commercial and intellectual viability extended and indeed increased.

A further, related problem exists. This is the political and more significantly, bureaucratic momentum that is created over time for particular projects or technologies that end up driving policy. That is, momentum that is created years earlier can have ramifications in the present because politicians and public servants have not the capabilities to re-open questions for public debate or to reflect on their assumptions and beliefs.

## ***Section 3: The political barriers to reactors and reprocessing***

### **1. Sutherland Shire**

The Federal Government has problems in Sutherland shire. One is that it has rushed through a highly problematic decision to site a new nuclear reactor in the area, against the wishes of the community that lives there. Secondly the fact that the facility creates high level waste is a politically untenable situation that requires some sort of political 'solution'.



## 2. South Australia

In South Australia there is overwhelming opposition to the proposal to site two nuclear waste dumps there, one of which is necessitated by the desire for the new reactor. This is not a controversial analysis of the situation.

There are significant obstacles in the path of establishing an off-site waste dump/store that put the viability of this option in serious doubt. The South Australian parliament will enact legislation that blocks the establishment of a store for intermediate level waste in that State. The Federal government will only be able to deal with this issue by enacting legally questionable legislation overriding the will of a majority of constituents in that State.

## 3. OSPAR: political opposition to reprocessing.

On June the 29th 2000 the OSPAR commission decided by an overwhelming majority (12-0 with three abstentions and one party not in attendance), to move towards ending reprocessing in Europe. This historic vote has put the long-term viability of the European reprocessing industry, on which the Australian nuclear industry relies, in doubt.

Before that date, the nuclear industry, and nuclear nations put faith in the fact that nuclear reprocessing was in line with the international/regional regulation on the prevention of marine pollution. Many readers will be unfamiliar with the track record of Australia's reprocessing partner. Here are some figures in relation to the discharges from the plant at La Hague, operated by Cogema.

The La Hague nuclear site is in Normandy, on France's Atlantic coast near the port of Cherbourg. La Hague is operated by the Compagnie Generale des Matieres Nucleaires (COGEMA), which is 81.5% owned by the government-controlled Commissariat a l'energie atomique (CEA), which oversees French nuclear weapons production, and a further 15% by the national petroleum company TOTAL. COGEMA is effectively government controlled and operated.

COGEMA has recently opened two new reprocessing plants, UP2-800 in 1994, and UP3 in 1989, increasing La Hague's annual reprocessing capacity from 400 to 1600 tonnes of spent fuel. Between 1989 and 1995, radiation in its discharges increased five-fold. Each year, La Hague dumps an estimated 230 million litres of radioactive waste into the Atlantic.

While radioactive tritium, strontium-90 and caesium-137 dominate La Hague's marine discharges, the facility releases many other radioactive isotopes. For example, the 1995 discharges of iodine-129 soared to 10 times their 1980 levels. In a single year, La Hague discharged five times more iodine-129 than was released during fifty years of nuclear weapons testing world-wide.

In 1997, public concern escalated over La Hague's contamination when Greenpeace sampling revealed that the plant's discharges had turned the sea-floor into a nuclear waste dump. Sand and gravel found near the mouth of the discharge pipe was so badly contaminated it fell within European guidelines for nuclear waste. In turn, crabs taken from around the discharge pipe were found to be contaminated beyond levels deemed safe for consumption by the European Commission. Samples of liquid waste discharges were around 17 million times more radioactive than normal sea water and contained dangerous, long-lived, radioactive isotopes like Americium-241 and Cobalt-60.



While the French government sought to quell public concern by imposing a fishing ban around the La Hague discharge pipe, it has taken no action to limit or stop the discharges.

Strong currents spread La Hague's contamination northward through the English Channel and the North Sea. Its traces are found as far north as Norway and the Arctic. Studies suggest that radioactive contamination from La Hague travels to southwest Norway in as little as 15 months.

In 2000, sampling revealed discharges from the La Hague pipeline contained particulates that were well over size, and 560 times more radioactive than legally allowed.

You would think that this sort of evidence was enough to convince anyone, that reprocessing is wrong, but it has taken many years of campaigning to challenge the orthodox assumptions of the reprocessing industry. Meanwhile, the message has not yet arrived in Canberra. Senator Minchin issued a press release earlier this year claiming that the La Hague operation was 'safe and responsible'. This begs the question: what is it exactly about La Hague that he is so impressed by?

Since June 2000, the nuclear industry can no longer argue reprocessing is acceptable. The OSPAR Commission demands (notwithstanding opposition from the UK and France) "inter-alia the implementation of the non-reprocessing option". Reprocessing is now contrary to the international policy concerning the prevention of marine pollution in the North East Atlantic. All those countries who voted for this resolution, it is hoped, will now look towards finalising any outstanding reprocessing contracts with BNFL and Cogema, and establishing dry storage options: nuclear responsibility in action. This will ensure not only political pressure being brought to bear, but also economic, as the number of contracts for reprocessing diminishes.

The Greenpeace stand-point on reprocessing has been legitimised with the support of all the countries bordering the NE Atlantic, with the sole exception of France and the UK (the countries with reprocessing facilities). The response of the French government and public is somewhat equivocal, despite current problems with MOX fabrication at Cadarache and a long history of environmental problems at La Hague. In the UK, the future of Sellafield is enveloped in difficult environmental, political and social complexities. However, if France and the UK do not respond appropriately to the OSPAR developments they will become European environmental pariahs. It will be ever harder for them to pour radioactive wastes in the sea surrounding their neighbors. Neighbors who have now asked them to desist. Countries to who Australia, as a customer of Cogema, should be listening.

It should be beholden on the Australian government and federal agencies to take into account the fact that the reprocessing option for spent nuclear fuel arising from HIFAR and the proposed new reactor will be significantly affected by this decision. It may be that there will be NO reprocessing option open to Australia in the very near future. Senator Minchin has said that as long as reprocessing continues to be legal in France it is acceptable. (Given that Australia has banned reprocessing in its own jurisdiction, this is a little like New South Wales sending its convicted murderers to Texas for the electric chair). Further investigation must be made into ANSTO's contingency plans for spent fuel management in relation to how these may be affected by the OSPAR decisions, particularly with reference to fuel handling, safety, and storage.

The OSPAR decision significantly effects Australia's nuclear future, and the full ramifications of the OSPAR decision should be debated and considered by the



government and the Australian public particularly in relation to operations at Lucas Heights.

### ***The future:***

The consequence of all of this is that the Federal government and ANSTO have no operable plans that definitively deal with the question of spent fuel management.. The options that are available are highly speculative. Without firmer plans, there should be no licensing of the Lucas Heights operation because the full life cycle plans of the nuclear materials used and produced have not been determined.

The closing window for political opportunism means that we will almost inevitably need to deal with our own spent fuel domestically. Whilst you would think that this was the responsible choice, the domestic treatment or storage of spent fuel has not been discussed with the public, but has not been put out of the question. In fact it can be argued that that the government's failure to prohibit spent fuel conditioning in the ARPANS Act confirms this. Australia of course has been looking at developing processes for conditioning spent fuel for many years. The problems of managing waste will be the legacy that falls to future generations to deal with the problems of managing this waste in this country. However, a single central question remains. Why, if we are considering dealing with the generation of nuclear waste for another forty years in a new reactor, were we not talking about a domestic process for spent fuel management? The answer, clearly, is because the Australian public would object to the project if they were aware of the full range of issues.

### ***Conclusion***

Of vital importance in all this is the fact that the federal government is hedging its bets. It currently has a speculative strategy for dealing with spent nuclear fuel, because the window of opportunity for the European option is closing. It is only a matter of time before the Australian government will need to deal with the problem of spent fuel domestically.

The issue here, and probably the most insidious part of this story, is that the Federal government is well aware of this problem. It is well aware that the political fix called reprocessing will disappear. Why then is it engaged in a headlong rush into building a new reactor? Why has the government banned reprocessing, but not banned spent fuel conditioning? Why has the government pushed through the process for building the reactor without listening to the community, and why has it not mentioned the fact that conditioning or long term storage of spent fuel is a possibility for Australia's future? Firstly because this is not a government which accepts its nuclear responsibilities, responsibilities of openness, accountability and concern for the Australian and international communities. Secondly, because it realises that it is running out of time; juggling between potential political backlash on the one hand, and its own ideological imperatives on the other.

### ***Appendix 1:***

#### ***Chronology of recent Greenpeace La Hague campaign events***

**Summer 1996:** Greenpeace conducts marine sampling for radioactivity off the coast of La Hague. Radioactive contamination from La Hague's discharges is found in various marine organisms such as algae.



**9-11 March 1997:** Greenpeace reveals that the radioactive discharge pipe from the reprocessing plant La Hague, owned by COGEMA, becomes exposed at the public beach "plage des Moulinets" during very low tides. Measurements by French independent laboratory, CRIIRAD, reveal that radiation levels at the surface of the pipe are more than 3000 times nominal background radiation.

COGEMA's Director of La Hague Patrick Lederman states that the pipe would only be exposed by such unusual tides once every 15 years.

**8 April 1997:** Within one month, the pipe is again exposed by low tides and Greenpeace files a legal complaint against COGEMA for endangering the public through its contaminated discharge pipe.

**May 1997:** COGEMA announces that it has plans to scrape scale out of the discharge pipe in order to bring down radiation levels. Greenpeace demands a full environmental impact assessment (EIA) by COGEMA to investigate how such an operation will affect the environment.

**13 June 1997:** Greenpeace-divers take samples from the seabed at the end of the pipe. Analysis reveal that the seabed at the end of the pipe contains more than 300.000 Bq/kg and officially should be classified as nuclear waste.

**July 1997:** French government imposes ban on fishing and all water based activities within 1km of the end of the La Hague pipeline.

**9 July 1997:** Cogema starts its controversial pipe-descaling operation after the French government fails to require an EIA. Patrick Lederman repeats that Cogema will absolutely guarantee that the operation will not have any effect on the environment.

**9 September 1997:** On the day that a Greenpeace diving team arrives in La Hague to investigate Cogema's operations, the French Government announces that the pipe descaling operation has lead to a spillage of some 50 kg of highly radioactive material on the seabed at the end of the pipe. Sediment collected by Greenpeace and analyzed by the French laboratory ACRO and The University of Bremen shows that the seabed is now 100 times more radioactive than before the descaling operation. Court case lodged by Greenpeace against COGEMA for contamination of the environment by the pipe descaling operations.

**September 1997:** Greenpeace conducts extensive sampling of marine organisms and reveals high contamination levels, especially in crabs. Greenpeace monitoring of La Hague discharge reveals that COGEMA are breaking their discharge authorisation by discharging large radioactive particles.

**17 September 1997:** French government nuclear safety inspectorate, DSIN, reveals that during the COGEMA pipe-descaling operation, in fact four accidents have occurred which led to radioactive contamination of different places around the pipe. Contradictory to its earlier promises COGEMA now states that 'it is obvious that such an operation leads to some contamination'.

**October 1998:** Greenpeace files court case against COGEMA for illegally discharging radioactive particles into the sea from la Hague.

**October 1998 to March 1999:** Greenpeace continues monitoring of COGEMA operations on the discharge pipeline.





**April 3 1998:** OPRI reveals that the radiation levels at the exposed part of the pipe are now as high as 200 microSievert per hour. Far higher than levels reported in 1997.

**22 April 1998:** Three days before a new low tide, COGEMA presents a new plan for 'cleaning' the seabed at the end of the pipe, which is still heavily contaminated due to the descaling operations. It also announces plans to cover the pipe on the beach with concrete to avoid it being exposed during low tides.

**27 April 1998:** Greenpeace demands a full environmental impact assessment (EIA) into COGEMA's plans to dredge the sea bed around the end of the pipeline.

Greenpeace confirms that levels of radiation off the pipe on the beach have gone up again since autumn 1997. Greenpeace also discovers an area of relatively high contamination on another place on the beach. Greenpeace demands EIA into dredging operation.

**June 1998:** Greenpeace monitors the sea bed around pipeline. Samples from outside the area of sea bed COGEMA plan to dredge are found to be as contaminated as the sea bed area planned to be dredged. Greenpeace also discovers new filter tanks on end of pipeline installed by COGEMA.

**23 October 1998:** Greenpeace starts research and monitoring of La Hague's radioactive aerial discharges. Monitoring reveals concentrations of radioactive Krypton-85 gas to be 90,000 times the nominal background level. November 1998: Greenpeace accuse COGEMA of violating its aerial discharge licence with regards the weekly permitted radiation concentrations in air around La Hague.

**January 1999:** Greenpeace continues its aerial sampling of radioactivity around La Hague.

**April - June 2000:** Greenpeace samples discharges from the La Hague pipeline and finds particulates to be illegally oversize, and up to 560 times more radioactive than legally allowed.

The OSPAR commission votes to move towards ending reprocessing in Europe.

