

**AEA Harwell -
Nuclear and Environmental
Hazards.**

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After much pressure from myself and colleagues, and following my report on reactor safety at Harwell for the Commons Select Committee on Energy, the two materials testing reactors at UKAEA Harwell closed on March 31st this 1990 (*See SCRAM No.76*).

The problems do not stop at the reactors. Recently, the contamination of the local water supply by Harwell has become a major issue. Harwell also houses one of the largest collections on intermediate nuclear waste in Southern England. There is also the hazard of decommissioning all the nuclear facilities on site - a problem as yet without a fully thought out solution.

Groundwater Pollution.

In our first report on safety at Harwell⁽¹⁾ we stated that pollution of the local groundwater from material dumped on the site was a strong possibility, because of the structure of the local geology. In 1990, solvents were discovered in the drinking water of people living around the Harwell area. The source of the water was a borehole three miles from the Harwell site. Later studies showed an underground plume of contamination extending out from the Harwell site towards this borehole.

During the early 1980's the British Geological Survey conducted extensive surveys of the Harwell area to determine whether or not the local strata were suitable to house a low-level waste disposal site. Their conclusion was that the local geology was very complex, very unpredictable, very porous, and very unsuitable for housing a waste repository. This, to any intelligent scientist, should have set alarm bells ringing as Harwell already had two sites containing toxic chemicals - but nothing was done.

A report on the initial studies into the extent and source of the contamination under the Harwell site has been written, but it is not available to the general public, and attempts to get a copy have met with stonewalling by the Harwell management. The only information available is a report compiled for the Harwell Local Liaison Committee⁽²⁾. This was produced in association with the consultants Harwell have employed to solve the problem - Dames and Moore International.

To solve the problem it is proposed that special plants will be built above the waste sites. They will suck up the polluted groundwater, separate the solvents by blowing hot air through the water, and then filtering the air given off to remove the solvents. The groundwater pumped out will be run into the local sewer. Though a practical idea, the Liaison Committee Report does not mention two significant facts. Firstly, low-level radioactive waste is buried alongside the dump sites, and this process will mobilise as much radioactive material as it will chemical contaminants. Secondly, more than 3000 gallons of water per day will be abstracted from beneath the Harwell site. The local water table is already low through abstraction for drinking water. Extra abstraction could have significant effects on the local environment and agriculture.

Decommissioning.

It was announced in February 1989 that the PLUTO reactor was to be shut down and decommissioned. It was stated in the press release that it would provide Harwell to develop further its expertise in decommissioning nuclear plant. However, Harwell have no *practical* experience in decommissioning reactors. The only practical experience of decommissioning within the UKAEA is held by the UKAEA's Northern Research Laboratories who are currently decommissioning the Windscale Prototype AGR - a totally different type and scale of reactor.

The Dounreay MTR, which is almost identical to the PLUTO reactor, and has been shut down for many years, and thus some of the fission products within the core have decayed. Decommissioning this first would reduce the dose to workers, and provide valuable information about decommissioning the more highly contaminated DIDO and PLUTO reactors. Under agreements made with the Dept. of Energy, the AEA are required to undertake decommissioning works in the most cost effective way, whilst ensuring that the workers receive the lowest possible dose of radioactivity. Under this agreement, they should be decommissioning the Dounreay MTR first, not the Harwell reactors.

There are more shut-down reactors at Harwell apart from DIDO and PLUTO. There have been many experimental reactors operating on the Harwell site since the late 1940's - some were very large. For instance, what has happened to the BEPO (5 MW) and LIDO (200 kW) reactors?. Have they been properly decommissioned, or have they just been left without any proper precautions being taken to ensure the safety of the local environment. Other parts of the plant, such as the fuel storage pond and the spent fuel handling facilities will also be highly contaminated. Some parts of the site, even if decommissioned this year, will not be safe for dismantling and disposal to well into the middle of the next century.

Before rushing into decommissioning the radioactive plant on the Harwell site, the UKAEA should be asked to create detailed plans in association with the NII, the NRPB, and the Department of Energy, to ensure that the best possible programme for safe decommissioning. This plan should be available for public comment.

Waste disposal.

Due to the lack of regulation over the years, waste management and disposal practices at Harwell have relied on patching together schemes which, it was hoped, would get rid of their wastes without causing contamination. As has been shown recently, this has failed.

Harwell buried quantities of low-level waste on site. Later, and to the present day, they incinerated low-level wastes and sent the radioactive ash to Drigg. The nuclear waste incinerators at Harwell have been operating for a many years, and yet it was only in 1990 that the Department of the Environment went through the process of authorising discharges of radioactivity into the atmosphere.

Radioactive effluent is regularly pumped into the Thames at Sutton Courtney. Despite the fact they have lost Crown Immunity, the discharge consent and sampling data for the radioactive discharges to the Thames are still not available to the public. Downstream AWE Aldermaston has its pipeline, and AWE Burghfield also discharges effluent into the Thames via the River

Kennet. What are the cumulative effects of these three discharge points?. It has been noted that an enhanced level of beta activity exist in the silt near the Harwell outfall into the Thames, and that these levels follow a pattern with the levels of caesium and plutonium isotopes within the silt.

In 1961 the pipeline carrying effluent to the Thames sprung a leak and contaminated 100 cubic metres of soil. Yet it wasn't until 1990 that consideration was given to the radiological hazard this might present to the public. Harwell were always very dismissive of the significance of this contamination, and it wasn't until we publicised this incident that they removed the contaminated soil. Even then it was only dug up and then dumped on the Harwell site. There was also a leak from the pipeline in 1988 which contaminated the surrounding soil at an apple orchard near Harwell. This leak is still being monitored.

Drums of intermediate level waste have been in stored at Harwell since 1983, and as stated in a letter some time ago, the design and construction of these drums gave no thought to their retention capability when stored above ground.

The AEA stated that repackaging these drums cannot be justified because of the dose which would be incurred by the workers. If they were to be soon sent to the NIREX repository then this would be true. However, the International Atomic Energy Authority has criticised NIREX's repository design and proposed construction methods, so the completion date for the project may be put back many years. How much longer will these drums be stored here?. The earliest guesstimate is 2010.

Serious consideration should be given to immediately repackaging them all. Due to corrosion and seepage, many of these drums will have to be over-packaged at some time anyway - many have been so already. Surely in terms of risk and dose to workers, it is more sensible to repackage a drum before it starts leaking, rather than after it starts leaking contaminating the surrounding area.

The decommissioning of active plant on the site will also add to the problems of waste on the site. Only recently another building was constructed on site to take intermediate waste generated by the cleanup and initial decommissioning of the reactors. Rumour has it that this building will also take active wastes from AWE Aldermaston, as they have nowhere suitable to put it. This will further swell the already huge collection of active waste on the Harwell site. There has been huge opposition to the NIREX waste dump at Sellafield, but every time Harwell has applied to store more intermediate waste on site, there has not been a murmur from any of the major anti-nuclear organisations. Why?.

Non-active wastes consist of many types of material - from old rope to toxic chemicals. From the late 1940's when the site was briefly used by the RAF, up until 1977, a large proportion of the more 'difficult' wastes, such as toxic chemicals, were dumped in two areas of the Harwell site. This is the material which is currently making its way into the local water supply. From 1977 onwards, most of the wastes were package and moved to approved disposal sites. Unfortunately the local dump site which accepts special wastes is located over the same groundwater aquifers, and is leaking too!.

There needs to be a thorough review of the waste disposal practices, past and present, by the local waste disposal authority. Unless Harwell are open about how they handle their wastes, it will be impossible to ensure that other incidents, like the pollution of the local groundwater,

do not happen again.

MoD Involvement.

The division of where military and civil safety standards apply at Harwell has never been made clear. It is hard to say if all facilities are covered by civil regulations, or whether certain sections are run with military standards either part of or all the time. The use of the Harwell facilities by the MoD for the machining of plutonium must be scrutinised. As a civil organisation the UKAEA are subject to IAEA/EURATOM, not MoD, standards. For example, it was revealed by the director of the UKAEA's Nuclear Materials Control Office that Harwell handles nuclear materials outside of safeguards. *Why* it is necessary for a civil establishment to take nuclear materials out of international safeguards, and what regulations it is kept under while these safeguards are suspended?..

From the work we have carried out, Harwell does not have a plutonium smelting facility. Therefore the plutonium must be transported to Harwell in its stable metal state, rather than as an oxide. This obviously presents problems of safety and security.

Areas of responsibility should be made between the UKAEA and the MoD. The two authorities would then be responsible for their actions in those parts of the site. This should stop the current confusion with the UKAEA hiding behind the MoD over certain areas of the site's work. It would also mean that strict standards could be set within the site, rather than the UKAEA switching between IAEA/EURATOM and MoD standards as they do at the moment. An inquiry should be held into the suspension of international standards governing nuclear materials at Harwell, and such instances should be forbidden from occurring in future.

It was recently announced that there would be a £40 million refurbishment of building 220, mainly dealing with extra air supplies and filtering, and new power supplies. This was announced shortly after the A90 complex at Aldermaston, which was to make the warheads for Britain's Trident missiles, was scrapped because of building faults. Are the two events linked?. The A1 building at Aldermaston, which made the Polaris warheads, does not have the capacity to make all 512 warheads by the time they will be required for service. Will Harwell conduct some of this work to make up the shortfall?. It is a strong possibility as building 220 is the only other site in Southern England, and the nearest site to the bomb making plants at Aldermaston and Burghfield, which is capable of this work.

Summary.

The information supplied to my latest letter makes me think that they have many things to hide. A significant pointer to this would be the copy of minutes of the last Local Liaison Committee which were sent to me. Despite the fact that this is a public body, they cut off sections of the minutes with scissors.

For many years the AEA Harwell management have neglected their responsibilities to manage safety and waste disposal policy on the site according to the law and good practice. The most recent manifestation of this lapse in responsibility is the pollution the local groundwater aquifer. I believe that the Harwell management have been extremely negligent,

perhaps to the point of being criminal, in their waste management practices on site.

Another example of the AEA's disregard for the law is their new car tyre burning plant. Under the Environmental Protection Act this is a scheduled process which must have the approval of the HMIP. It was started up this year without the approval of the HMIP, and without the local district Environmental Health Department knowing of its existence!. I also have a report from inside Harwell, as yet to be confirmed, that they cut away part of DIDO or PLUTO's reactor vessel without authorisation from the Nuclear Installations Inspectorate, and so had to weld it back in place again!. Would you trust these people?

A full public investigation into the causes, extent and effects of the negligent acts perpetrated by the AEA needs to be carried out as soon as possible - before any greater damage is done!. The AEA, the Nuclear Installations Inspectorate and the Department of Energy now seem to have closed ranks to prevent and further revelations on the safety of the Harwell site becoming public knowledge. Such information would not only damage the AEA - it would be severely embarrassing to the Dept. of Energy, and especially the NII.