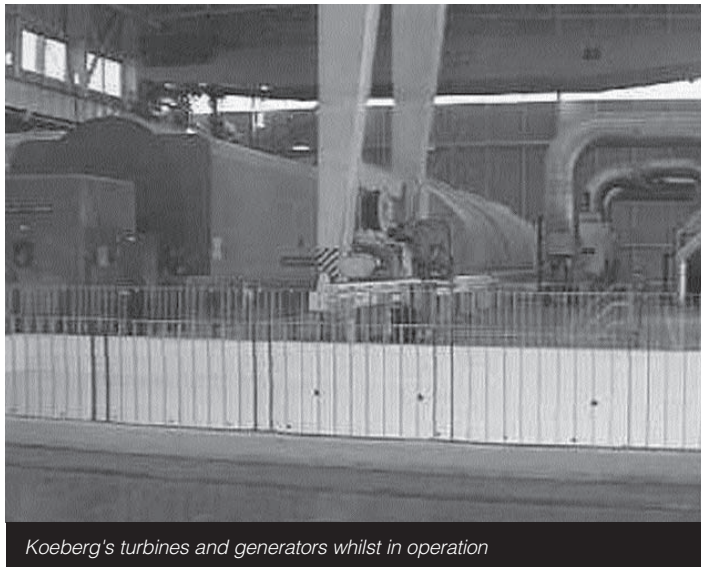


# Risky, expensive and jobless Why the nuclear path?

Government sees nuclear power as the means to supplying our growing energy needs. **David Fig** however points to the dangers of this strategy and highlights more creative energy routes.



*Koeberg's turbines and generators whilst in operation*

**T**he power outages in the Western Cape over the summer of 2005-6 have shown up the poor management and decision-making in Eskom's provision of electricity. Millions of rands have been lost as production lines were disrupted and the service economy frustrated.

Part of the problem has been Eskom's over-investment in nuclear energy. This highly centralised, high technology form of generating electricity has mostly been questioned by environmentalists because of the dirty legacy of waste, and the potential for devastating radioactive accidents. The latter is being underlined as the twentieth anniversary of the Chernobyl disaster is commemorated around the world

on 26 April 2006.

The power outages are pointing to huge weaknesses in South Africa's energy planning. The plans to expand our nuclear industry are therefore not just of concern to environmentalists but to all energy users.

#### **WHAT WENT WRONG AT KOEBERG?**

From 1977 the apartheid government built two nuclear plants at Koeberg, on the coast 24km north of Cape Town. This was to compensate for the distance of the Western Cape from the coalfields of the Mpumalanga highveld. Despite an ANC bombing, the plants opened in 1983 and 1984. It took some years for them to reach full efficiency, but by the

late 1990s they were generating approximately 80% of the Western Cape's electricity needs.

During 2005, a series of incidents (including a fire under a pylon) caused one of the two nuclear plants at Koeberg to trip, and disrupt power to the grid. More seriously, on Christmas Day 2005 it was discovered that the rotor of a generator had been damaged by the presence of a misplaced bolt. The plant had to be shut down for some weeks pending the sourcing in France and shipment of a replacement rotor in early April.

This led to more substantial power disruptions throughout the Western Cape, affecting most households as well as services, industry and agriculture. Recent



Vaalputs – a nuclear waste dump in the Northern Cape

harvests of fruit and wine had to be destroyed. Electric pumps operating sewerage systems failed, and sewerage leaked into wetlands and freshwater bodies important to biodiversity, destroying their ecosystems for at least the next decade. The growing tourism industry feared that its clients would select other destinations based on the unreliability of the electricity supply.

The second plant at Koeberg also has to shut down for some weeks in the autumn because its nuclear fuel needs routine replacement. If both plants are shut simultaneously, severe electricity cuts will once again hit the Western Cape whose winter is beginning to bite.

On the eve of municipal elections on 1 March Minister of Public Enterprises Alec Erwin held a press conference in which he strongly implied that the damage at Koeberg was the result of sabotage. Minister of minerals and energy, Lindiwe Hendriks, alleged that these actions were an attempt to affect the outcome of the elections. The ministers announced their intention to have the matter investigated by the National Intelligence Agency.

The media and trade union response was one of outrage, and minister Erwin had to deny accusations of sabotage.

Public response in the province has been focused and a range of organisations, including Cosatu's Western Cape region, are collaborating in an Electricity Crisis Committee and an alliance called Umbane Kumntu Wonke (Electricity For Everyone). Umbane is a joint campaign involving Samwu, Numsa, Cosatu, SACP, Sanco, Ilrig, Cape Town Anti-Privatisation Forum and other groups. Both Cosatu and the National Union of Mineworkers have recently passed congress resolutions opposing the government's nuclear policy.

#### WHY PERSIST ALONG THE NUCLEAR PATH?

The remnants of the apartheid nuclear industry has persuaded government that nuclear technology is good for South Africa. It argues that it will provide energy in bulk, create exports, and help develop a future hydrogen-based economy.

It also claims, wrongly, that nuclear reduces emissions of greenhouse gases. While nuclear reactors generate little carbon emissions, the nuclear fuel cycle as a whole (including mining, transport, enrichment, fuel fabrication, construction) adds substantially to emissions. Overall less emissions are generated than by coal, but considerably more than other renewable energy sources.

Government is putting forward the above reasons for the investment of nearly R16 billion of public funds for a demonstration model of a small reactor based on pebble bed technology, as well as a factory to process the nuclear fuel.

In addition, according to an announcement in London earlier this year by minister Erwin, Eskom may purchase a further large-scale reactor for installation at Koeberg.

#### WHY ARE THESE PLANS BAD?

Critics of expanding the nuclear industry argue that it is bad for our environment, bad for jobs, bad for other aspects of our economy, and bad for our democracy.

The assault on the environment comes both in the form of nuclear waste and the possibility of radioactive leaks affecting workers and surrounding communities.

Nuclear waste, especially spent fuel, must be insulated from the environment for a period of 244 000 years before losing its radioactivity. Humankind has no solutions to this problem. We are not used to dealing with technologies that last over such time-scales.

Nuclear accidents are unusual, but smaller accidents are common. Over 200 workers at NECSA, the Nuclear Energy Corporation of South Africa, at Pelindaba, are now claiming that they were victims of occupational doses of radioactivity during their work lives.

Irregularities at Koeberg, exposed by *Noseweek*, include Eskom's medical authorities not giving workers information about their exposure to radioactivity while on the job.

Koeberg's closeness to Cape Town and the agricultural lands of the Western Cape, means that if a sizeable accident happens, tourism, biodiversity and agricultural export assets would be devastated. There would also a large outbreak of diseases such as cancers, radiation sickness and genetic defects, as the people of the Ukraine, Belarus and

elsewhere found after the nuclear Chernobyl accident.

Economically the nuclear industry centralises energy in a few plants that are expensive to build and have a history worldwide of cost overruns. They deliver only a few jobs, and need to employ a small group of highly trained technicians with skills in nuclear engineering. Part of the problem at Koeberg has been a shortage of skilled operators, placing pressures on those that exist to work longer shifts. Contrast this situation with renewable energy sources, which would deliver considerable jobs at various skills levels, and ensure decentralised power sources for many communities.

Because we no longer enrich our own uranium, we have to send the mineral to countries with enrichment capacity like France, Russia or Britain. We will re-import it through Durban, truck it to Pretoria (where the pebbles are likely to be made), and then send them on to the demonstration reactor at Koeberg. If pebble bed reactors multiply around the country, our roads and harbours will fill with truckloads of nuclear material, opening the way to spillages and accidents. The many local municipalities en route will have difficulty with cleanups, evacuations and control of radioactive releases.

The financial risks of the development costs (R15,9 billion) of pebble beds will mostly (85%) be undertaken by taxpayers. This has occurred without any public debate or discussion on energy priorities and choices of technology. There are also no export orders to date. Eskom has in the past expressed reluctance to accept large orders for these reactors. The long-term

viability of the technology is still at issue, making it a risky commercial proposition.

The nature of the technology is such that if nuclear material falls into the wrong hands, we risk proliferation of weapons of mass destruction. Therefore even the civilian nuclear industry needs to operate under a veil of secrecy and excessive security precautions. It recently came to light that former makers of apartheid's nuclear weapons were recruited into international nuclear weapons trafficking networks. Even though FW de Klerk terminated the bomb programme in 1990, a thousand people were involved and were never brought to account under the Truth and Reconciliation Commission.

To defend the industry we need a security state that we had during apartheid. This makes the building of democracy very difficult. Is this the legacy we want for the future?

With increasing evidence of the health problems generated by the industry, the credibility of the National Nuclear Regulator is at stake. This is particularly so since the cabinet approved the appointment of a former official of the pebble bed company as the Regulator's CEO. Can the Regulator, which has to licence each pebble bed reactor, really behave impartially?

#### WHAT ARE THE ALTERNATIVES TO NUCLEAR?

There is no doubt that we are going to need extra energy for future industrial development. The state has announced the Accelerated and Shared Growth Initiative (ASGISA), but has given little thought to questions of energy conservation and investment in development

that is not energy-intensive. Instead, it is business as usual, with encouragement given to energy-intensive industries and plans for low-employment energy generation.

Whilst government pays some lip service to harnessing renewable energy sources (such as solar, wind, wave, tidal and certain forms of biomass and hydro-energy) this is happening on such a small scale that government rejects it as an option for delivery of bulk energy supplies. Nevertheless, new research is beginning to show that it is far less risky than nuclear, will be job-enhancing, and kinder to the environment and our pockets.

Why does the government not see this logic? Having climbed onto the pebble bed investment bandwagon, the state is not keen to abandon its commitment, but may be throwing our good money after bad in the interests of trying in vain to recoup this investment.

Government rhetoric also displays a disturbingly narrow technological nationalism which outweighs commitments to pro-poor energy solutions. Growth is the new religion, spurred on by large energy consumers. It would be far smarter, as the *Jo'burg Memo* (drafted in 2002 by an international think tank including South Africa's Prof Vivienne Taylor) pointed out, for countries of the South to end the fixation on the obsolete development model of the North, and leapfrog into the solar age. "A solar economy," it argues, "holds the prospect for including people and saving resources."

*David Fig is an independent environmental policy analyst and the author of "Uranium Road" (Jacana Media, 2005).*