

**Attention Royal Commissioner,
Rear Admiral the Honourable Kevin Scarce AC CSC RAN (Rtd.)**

**Response to the Nuclear Fuel Cycle Royal Commission's
Tentative Findings**

By Dr Andrew Allison, B.Sc. B.Eng. PhD. (Elec. Eng.)

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INTRODUCTION

One of the Key Tentative Findings of the Nuclear Fuel Cycle Royal Commission is that: *“The storage and disposal of used nuclear fuel in South Australia is likely to deliver substantial economic benefits to the South Australian community. An integrated storage and disposal facility would be commercially viable and the storage facility could be operational in the late 2020s.”* [1]

I argue that this finding is open to challenge on technical, and economic grounds. I point out that no country has yet successfully operated a permanent high-level nuclear waste storage facility, without incident, for any substantial length of time. This includes technologically advanced nuclear nations, such as the USA, and Russia. These countries have been generating nuclear waste for over fifty years and yet they have still not solved the waste storage problem. It is stretching credibility to the limit to imagine that a non-nuclear country, like Australia, could succeed where the USA and Russia have failed.

No country has ever operated a high-level nuclear waste storage facility, as a commercial enterprise. It is doubtful that anybody ever will, because the service is impossible to price. No markets exist for this type of service.

My sentiment has previously been expressed in the submission from the Australia Institute: *“The case for high level waste storage or use in South Australia is much worse. Put very simply: there are many countries with a mature nuclear industry, and most of them hold a large amount of high-level nuclear waste. If there were a way to profit from that waste, those countries would be in the best position to profit from it. Expansion of the nuclear fuel cycle in Australia carries tremendous risks for dubious rewards. The problem of what to do with high level nuclear waste is something most developed nations have struggled with, and to date no country has solved it.”* Dan Gilchrist [1]

WASTE DISPOSAL TECHNOLOGY IS STILL EXPERIMENTAL

At the Media Conference on 15th February 2016 for the release of the “Tentative Findings” Report, Commissioner Kevin Scarce stated, *“We’ve had waste now for 50, 60 years. There has not been an international solution yet.”* It is difficult to reconcile this admission, with the advocacy of a nuclear waste repository in South Australia.

At the present time, the only deep geological repository that actually contains nuclear waste is the “Waste Isolation Pilot Plant” (WIPP) in New Mexico, USA. This suffered a major radiological incident in its first decade, due to a chemical explosion. Twenty one workers suffered low level internal contamination. There was a measureable leak of waste from the site into the environment. The facility cost \$19 Billion to establish and will cost another half a billion to clean up [4].

I will watch future technological developments in the nuclear industry with interest. I wish them success, because there are problems to be solved, but I do not believe that South Australia should be an early adopter, of the technology, because at the present state of development is still incomplete and hazardous.

THE NUCLEAR FUEL “CYCLE” IS INCOMPLETE

The basic problem, with the concept of a nuclear fuel “cycle” is the segments have not yet been joined up to form an actual cycle. The global capacity for reprocessing is inadequate. Many nuclear countries are not reprocessing at all. This means that spent fuel is piling up as waste. This compounds the problem with waste disposal, which is also inadequate. No country has yet completed and demonstrated a high-level permanent nuclear waste disposal facility, not even technologically advanced countries like the USA, UK or Russia. There are lots of plans, and incomplete projects, but no actual complete technology.

For over fifty years, most nuclear material has moved on a one-way journey from mines, through reactors, to temporary storage facilities. The fraction of material that has been bred, reprocessed, and then used as fuel is very small. It is misleading to call the chain of transformations a “cycle” until more technology has been developed.

AUSTRALIA IS A NON-NUCLEAR COUNTRY

I do not wish to criticize the abilities of Australian scientists, technicians and engineers, especially those at ANSTO.

<http://www.ansto.gov.au/>

Having said that, I am disturbed by the scale of the proposal in the Tentative Findings. Australia does not have a nuclear power industry. We only have a research reactor, and we do not have the numbers of staff, and the depth of experience to cope with the grand proposal in the Tentative Findings.

THE WASTE REPOSITORY PROPOSAL VIOLATES EXISTING AGREEMENTS AND AUSTRALIAN LAWS

The World Nuclear Association has written: “At present there is clear and unequivocal understanding that each country is ethically and legally responsible for its own wastes, therefore the default position is that all nuclear wastes will be disposed of in each of the 50 or so countries concerned.”

Current South Australian laws prevent the government from spending any of the State’s money on nuclear energy.

The Tentative Findings do not really present a good case for repealing existing laws.

THE PROPOSAL FOR AN INTERIM STORE IS COMPLETELY NEGLIGENT

The most alarming part of the Tentative Findings is in section 89, where an “interim store” is proposed: *“imports of used fuel with interim storage and associated revenues commencing at year 11 after the project decision”*.

The proposal is that we should accept waste before the repository has been completely built and tested. This proposal is so reckless, as to be negligent. We would face the very real risk of being left with high-level nuclear waste, and no technology to properly handle it.

I am amazed that a government would even entertain such an outrageous proposal. We live in an era where it is argued that governments cannot operate, power utilities, water distribution, trains, bus services, banks, and communications services. At the same time, it is being proposed that the government of South Australia, alone in the history of the world, can acquire the expertise to operate a successful nuclear waste storage facility,

and we are so confident of the ability of the government that we don't even have to wait for the facility to be completed and tested, before accepting high-level nuclear waste. This seems to be extremely contradictory, and risky, to me.

ECONOMIC BENEFITS ARE UNCERTAIN AND MAY NOT BE WELL DISTRIBUTED

Jacobs [5] published a disclaimer on their work which states: "In no part of this report does Jacobs, either explicitly or implicitly, make any recommendation or endorsement of the viability or otherwise of the Project."

Despite this, the "Tentative Findings" Report proposes a nuclear waste case using cost estimates that Jacobs say "are conceptual in nature" and that "... should only be regarded as no better than -50% to +100%". This is a major contradiction. In my view, the pricing of commercial nuclear waste disposal is very speculative.

There is no marketplace for the international transfer of liability for high level waste. There is no known price that can be confidently used in a business case analysis. These points are all admitted in the "Tentative Findings" of the Royal Commission. There is no overseas commitment to the price used in the Jacobs' analysis. The pricing is completely speculative.

Finally, if high-level nuclear waste disposal were profitable, then would it not be even more profitable for more experienced nuclear countries to enter into the waste disposal business on a for-profit basis? Nuclear countries already, possess nuclear technology, and stockpiles of waste. It is rather implausible to argue that they have a shortage of the right type of rocks.

This highlights a basic contradiction of the proposal. If the technology works then South Australia will face competition in a competitive market. If the technology does not work then South Australia may well be left with waste, and no means of storing it safely.

CONCLUSION

The "Tentative Findings" Report proposes establishing a high-level international nuclear waste dump in South Australia. At best, this proposal seems to be reckless. We should not become an early adopter of this experimental and hazardous technology.

No prudent government should force these risks, associated with high-level nuclear waste, onto their people, in perpetuity, merely in the pursuit of uncertain short-term financial gain.

To paraphrase Richard Dennis, of the Australia Institute: Australia is a lucky country, without any high-level nuclear waste. The plan [outlined in The Nuclear Fuel Cycle Royal Commission's Tentative Findings] seems extraordinary. It is proposed that we should give ourselves a waste problem in the hope that we, unlike everyone else, could solve it – like a person who takes up smoking just to prove they can quit. [3]

REFERENCES

[1] NUCLEAR FUEL CYCLE ROYAL COMMISSION TENTATIVE FINDINGS, February 2016, Adelaide, South Australia, © Nuclear Fuel Cycle Royal Commission

[2] An industry out of time, Submission to the South Australian Nuclear Fuel Cycle Royal Commission, by the Australia Institute, July 2015

[3] An expanded nuclear industry in South Australia makes no economic sense, Richard Denniss, The Guardian, Tuesday 18 August 2015 08.00 AEST

<http://www.theguardian.com/commentisfree/2015/aug/18/an-expanded-nuclear-industry-in-south-australia-makes-no-economic-sense>

[4] “Wrong kitty litter led to radiation leak at New Mexico nuke waste dump”, Laura Zuckerman, Reuters, Fri Mar 27, 2015.

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[5] “Radioactive waste storage and disposal facilities in SA”, Jacobs MCM, 9th February, 2016.

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