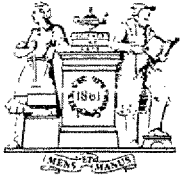


FIRST DRAFT

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MEMORANDUM

TO: Whomever
FROM: Mike Driscoll
DATE: October 25, 2001
RE: How to Kill Nuclear Power With Good Intentions – A Primer

*Insert (G)
all that is
circled in
red*

* * * * *

We are all familiar with the arguments and tactics of the avowed opponents to nuclear power. However, various proponents espouse ideas, or tolerate inequities, which could prove equally detrimental to its future. Here are a few of the more toxic attitudes (classic list of ten):

1. Actinides should/must be removed from spent fuel and destroyed by transmutation and/or fission. This is a ruinously expensive proposition (see attached short paper) primarily because of the high cost of reprocessing and fuel refabrication.

2. Reprocessing is either necessary or desirable for one or more of the following reasons:

- to recover valuable fissile material,
- to allow concoction of a more robust waste form,
- to recover actinides for their enumeration,
- to enable deployment of breeder reactors.

- Whatever the motive, reprocessing will increase costs compared to a once-through fuel cycle for the foreseeable future. It also inflames concerns over reprocessing facilities as sources of weapons materials, target for terrorists, etc.

3. Promise meeting the seemingly plausible goal that spent fuel from any new reactor concept must have a composition at least as intrinsically unsuitable for weapons use as that of current LWRs. This immediately disqualifies all fast (and epithermal spectrum) reactors and all using thorium, which do not denature their U-232 by adding U-238.

4. Acquiescence to the fiat that HLW must be retrievable from its repository. – This rules out further evaluation of potentially better approaches (cheaper, improved containment) such as deep boreholes and sub-seabed disposal. It also plays into the hands of those who claim repositories will be a storehouse of weapons usable material to tempt future generations.

(Handwritten signature/initials)

5. Encouragement of a protracted evaluation of new reactor concepts, many of which sacrifice economic performance to achieve cosmetic features that will hopefully pacify the opposition. — As the attached table of defunct "Generation Zero" reactors testifies, there is very little option space left unexplored. If the best currently available technology is not soon committed to construction, the infrastructure will further atrophy to the point where revival/renewal becomes much more difficult and too slow to ramp up in a timely fashion.

6. Deference to the sensitivities of the utilities who concurrently operate coal-fired stations. — Waste products from coal are exempted from the stricter regulations applied to other industrial wastes. On a level playing field, coal, the principal alternative to nuclear, would be priced out of the market on this basis alone. In like vein, avoidance of conflict with those who refuse to credit nuclear power with the benefits of CO₂ avoidance and its overall lower externalities (see attached table from the EXTERNE study). Similarly, fail to remind one and all that nuclear power has already internalized most of its costs; e.g., the first layer (non-governmental) of Price-Anderson insurance, fees paid the NRC to cover the costs of regulation, the 1 mill/kWhr waste disposal fee, etc.

7. Toleration of wasteful government boondoggles, the latest being the initiative by USEC to resurrect a domestic enrichment centrifuge program (on which some \$3.6 billion were spent two decades ago), when URENCO, for example, is ready, willing and able to build a plant in the US — not to mention the shameless hypocrisy of denying LES a site permit on the grounds that they would abuse minority group environmental rights. — At the same time we stint on basic research to find novel, cheaper isotope separation methods.

8. Fail to concede and act upon the fact that there are breeder reactor concepts that do not require reprocessing/recycle, such as those proposed by the late George Fischer of BNL and E. I. Toshinsky in Russia. — This would enable us to develop and deploy breeders before bowing to the ultimate necessity(?) of recycle.

9. Understanding terrestrial uranium resources because of the short-range nature of commercial expenditures on exploration and failure to credit the mining industry with their proven ability to innovate (over the past century metals costs have, on average, declined in constant dollars). — See the attached short paper by Ghahramane and Driscoll who succumbed to this syndrome many years ago. While it is not necessarily prudent to assume that innovation will continue to outpace growing scarcity, we should not base any strategy on the premise that the competition is in a static or backsliding mode.

10. Promote "high burnup" as a panacea for LWRs and/or other thermal reactors. — It is easy to show that ore and SWU utilization are maximum under roughly current conditions. What do the wasted dollars buy one? Similarly, on the once-through cycle, use of thorium is also a waste of money. Contrary to persistent claims by those who should know better, thorium use without recycle will only save about 10% on uranium consumption; uranium is needed to provide the U-233, and not particularly to provide a companion fertile species.

Also note that the requirement that denaturing bred U-233 with U-239 (to < 12 w/o) penalizes neutronic performance (hence economics) and results in non-negligible Pu production.

The bottom line is to stress economic performance and a fair internalization of externalities.