THE URANIUM DEBATE:
What the Fox Report Really Said
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The First Report issued by the Ranger Uranium Environmental Inquiry headed by Mr Justice R.W. Fox has given anything but the green light to the mining and export of uranium. Indeed, far from encouraging any "go-ahead", as mining interests and some of the less reputable media would have us believe, the Fox Report has properly concentrated on "the hazards, dangers and problems of and associated with the production of nuclear energy". While the Commission's recommendations lack the clarity and vigor that one would have desired, there is no disputing the fact that the Commission has accepted the main thrust of the evidence submitted to it by the opponents of nuclear power. The Commission thus concludes:

"Policy respecting Australian uranium exports, for the time being at least, should be based on a full recognition of the hazards, dangers and problems of and associated with the production of nuclear energy, and should therefore seek to limit or restrict expansion of that production." (p. 185.)

Having come to such a far-reaching conclusion about one of the most crucial questions of our time, it is perhaps disappointing that this otherwise valuable report should nevertheless contain a number of ambiguities and inconsistencies. This limitation, however, is acknowledged in the Report itself and attributed, at least by implication, to the "somewhat different views" held by each Commissioner (p.175). No doubt, it is this appreciation of the importance of value judgments which led the Commission as a whole to the conclusion that -

"Ultimately, when the matters of fact are resolved, many of the questions which arise are social and ethical ones" (p.6.)

From this premise it follows naturally that -

"... the final decisions should rest with the ordinary man and not be regarded as the preserve of any group of scientists or experts, however distinguished." (p.6.)

RISKS IN FUEL CYCLE OPERATIONS

Precisely because the Fox Report gives so little encouragement to mining and export of
uranium, the pro-nuclear lobby has been forced to rest its case almost entirely on points 1 and 2 of the summary of findings and recommendations (pp.185-6). However, on close scrutiny it is clear that these two conclusions, relating to the hazards of mining and milling uranium on the one hand and the operations of nuclear reactors on the other, do not constitute a recommendation in favor of the mining and export of uranium. The Commission has merely argued that these two risks do not, in its view, provide a compelling reason for banning the mining and export of uranium. Many would question the validity of this conclusion, but all that it entails is simply the notion that, if the Commissioners were satisfied on all other counts, they would not feel justified on these two grounds alone in recommending against uranium mining and exports. As it happens, the three Commissioners make it clear that they are far from satisfied that the many other risks, dangers and costs associated with nuclear power can be easily or effectively overcome. In any case, the Report insists on “close regulation and constant surveillance” (p.177) and admits that such controls are likely to be adequate only in relation to “the hazards involved in the ordinary operations of nuclear power reactors” (p. 185). Presumably an altogether different and unacceptable set of hazards could arise in the event of technical or human failure, war, an act of deliberate sabotage (p. 95), or earthquakes and other geological disturbances (p.97).

RADIOACTIVE WASTES

The Report readily admits that the disposal of low-level and intermediate-level wastes could pose a serious problem in the future “if supervision were relaxed, or if the operation became too widespread, or the bulk too great” (p.177). As for high-level wastes, the Commission concludes:

“There is at present no generally accepted means by which high-level waste can be permanently isolated from the environment and remain safe for very long periods .... Permanent disposal of high-level solid wastes in stable geological formations is regarded as the most likely solution, but is yet to be demonstrated as feasible. It is not certain that such methods and disposal sites will entirely prevent radioactive releases following disturbances by natural processes or human activity.” (p.110.)

This assessment of likely risks leads the Commission to quote and endorse the findings of the British Royal Commission on Environmental Pollution chaired by Sir Brian Flowers:

“There should be no commitment to a large program of nuclear fission power until it has been demonstrated beyond reasonable doubt that a method exists to ensure the safe containment of long-lived, highly radio-active waste for the indefinite future.” (p.187.)

The creation of large amounts of long-lived radioactivity is described as a problem of “first-rate international importance” which demands “careful watching” and “regular and frequent reassessment”. The Commission makes it clear that, unless satisfactory disposal methods are established in the very near future, it will not be possible to justify supplies of uranium by Australia. (p.178.)

NUCLEAR THEFT AND SABOTAGE

The Commission regards the possibility of theft and illicit use of nuclear materials and the sabotage of nuclear facilities as one of the most serious dangers surrounding the nuclear industry. It does not believe that nuclear installations can currently withstand determined assaults by terrorist organisations, or that it will be possible in the future “to provide sufficient defences to render every installation safe against attack by even small numbers of well-armed, trained men”. (p.152) In the light of evidence submitted to it, the Commission accepts the view that -

“ .... a terrorist group could use reactor grade plutonium to make a bomb with good prospects of giving a yield of several hundred tonnes of TNT .... An explosive yield of a few hundred tonnes of TNT might be sufficient to destroy a very large skyscraper with severe loss of life. The ionising radiation released and the subsequent fall-out would also kill and injure many people.” (p.154.)

On the question of safeguards against such
risks, the Commission acknowledges:

"While provision of security adequate to guarantee against terrorist intrusion is theoretically possible .... there must be a question whether adequate precautions will in fact be taken." (p.178.)

The Fox Report also raises the serious possibility that powdered plutonium might be deliberately dispersed into the atmosphere (p.155). Such a probability would of course grow proportionately with the projected increase in the amount of plutonium circulating around the world.

The unique potential of plutonium for threat and blackmail against society leads the commission to the obvious but frightening conclusion:

"There is a very real risk that the opportunity and the motive for nuclear blackmail will develop with time. Some common characteristics of terrorist groups suggest that they might attempt to make and explode atomic bombs or make other terrorist uses of nuclear materials or facilities .... Major difficulties could arise in attempting to determine the reality of a threat by a group to explode an atomic bomb, to spread radiation from a reactor, or to disperse plutonium. Either acceding to or refusing the demands of such a group could have very adverse consequences for society." (p.159.)

PROLIFERATION

In the view of the Commission the most serious danger is undoubtedly that of proliferation of nuclear weapons. In this regard, the inadequacy of the safeguards provided by the Non-Proliferation Treaty (NPT) are readily recognised. The Commission argues, in fact, that both the NPT and the International Atomic Energy Agency (IAEA) have contradictory objectives in so far as they seek to promote the peaceful uses of atomic energy while at the same time attempting to restrict its war-making potential. India’s detonation of a nuclear explosive in May 1974 is cited as an illustration of the many difficulties surrounding any attempt to implement a fully effective safeguards system. The Commission concludes that "a commercial nuclear program, particularly if it can be designed to include enrichment or reprocessing facilities, or both (on however small a scale), does offer a satisfactory ‘halfway house’ to a military objective.” (p.127.) Hence the Commission’s blunt statement:

"The nuclear power industry is unintentionally contributing to an increased risk of nuclear war.” (p.185.)

The Fox Report leaves no doubt that, in its view, the existing NPT safeguards system is both weak and deficient. Not only has the Treaty not received universal adherence (p.125), but many of the non-signatories, notably China, France, Argentina, Brazil, India, Pakistan, Egypt, Israel, South Africa, are either nuclear or near-nuclear countries (p.197). The powerful commercial incentives which are encouraging the current spate of agreements between the suppliers and the consumers of nuclear technology are likely to erode further the viability of the NPT system (pp.125-6). Another obvious weakness recognised by the Commission is the possibility of unilateral withdrawal from safeguards agreements:

"The wide nature of the discretion available to each state that does wish to
withdraw is evident ... Thus, even if international safeguards were in themselves a totally adequate guarantee against diversion by governments, those safeguards are dependent upon treaty arrangements that can be terminated by unilateral act.” (p.128).

But, in actual fact, the existing safeguards are themselves far from adequate. Moreover, even if some of the difficulties could be overcome by revised drafting of the agreements, the Report raises serious doubts as to whether Australia “would be able to call upon sufficient personnel with the expertise to carry out” the functions required by back-up arrangements (p.129). Similar doubts are expressed in relation to the degree of pressure that Australia would realistically be able to exert on the importing state in order to ensure compliance with back-up safeguards requirements (p.130). Similarly at the international level, the Commission acknowledges the difficulties that are likely to arise from the growing financial burden of safeguards (p.135) as well as from the increasing demand for suitably trained personnel to carry out the necessary inspection duties (p.136).

Regarding the complex task of controlling the transfer of nuclear materials, the Commission explicitly states:

“The NPT does not prohibit the further transfer of materials by a receiving state to a third state, and is not entirely satisfactory in the provision it makes for safeguards on such transfers.” (p.130.)

This and other limitations have spurred the great powers, and particularly the United States, to seek stricter controls on the international transfer of nuclear technology and nuclear equipment. Thus far, these efforts have met with little success because they have been inevitably negated by narrowly conceived commercial and national interests.

Given the inescapable realities of national sovereignty and profit-oriented policies it is difficult to see how any improvements to existing safeguards arrangements can, in practice, mitigate, let alone eliminate, the fundamental weaknesses of the NPT system. In this regard it is worth quoting the comprehensive summary of these weaknesses provided by the Report itself, which include:

“.... the failure of many states to become parties to the NPT; the inability of safeguards to prevent the transfer of nuclear technology from nuclear power production to the acquisition of nuclear weapons competence; the fact that many nuclear facilities are covered by no safeguards; the existence of a number of loopholes in safeguards agreements regarding their application to peaceful nuclear explosions, to materials intended for non-explosive military uses, and to the retransfer of materials to a third state; the absence, in practice, of safeguards for source materials; the practical problems of maintaining effective checks on nuclear inventories; the ease with which states can withdraw from the NPT and from most non-NPT safeguards agreements; deficiencies in accounting and warning procedures; and the absence of reliable sanctions to deter diversion of safeguarded material.” (p.147.)

Little wonder that the Commission is forced to the conclusion that “these defects, taken together, are so serious that existing safeguards may provide only an illusion of protection” (p.147). It is, therefore, somewhat surprising to find the Commission recommending that, in the event of Australia deciding to sell its uranium, such exports “should be subject to the fullest and most effective safeguards agreements, and be supported by fully adequate back-up agreements to the entire civil nuclear industry in the country supplied” (p.185). In so doing, the Report is merely advocating the very course of action on which it has itself cast the most serious doubts on the grounds of technical, political and economic impracticality. One can only assume that, in referring this critical question back to Parliament, the Commission’s intention is to leave it to the Australian people and to their elected representatives to determine whether or not Australia can effectively apply and enforce the stringent safeguards which are necessary but on which the international community has so far failed to agree.

WIDER SOCIAL CONSEQUENCES OF NUCLEAR POWER

Although one of the most disappointing aspects of the Report is its treatment of the
social consequences of a plutonium economy, it is worth noting that the Commission was sufficiently concerned with the issue to regard it as an important reason for reducing the growth in energy consumption (p.35). Significantly, the Commission received no evidence contrary to that submitted by the critics of nuclear power who argued that increasing dependence on electricity distributed through a centralised grid "would require administration by a remote and bureaucratic technical elite, lead to a great concentration of political and economic power, and be vulnerable to large and expensive technical mistakes and failures" (p.35).

While no effort was made to assess the argument that "the large scale and complexity of nuclear power will reduce the opportunity for greater public control of decision-making and may threaten democratic procedures and civil liberties", the Commission agreed that many countries will be forced to take account of these considerations in their energy policies. Presumably the social and economic implications of nuclear power will need to be an integral part of the Australian uranium debate.

ECONOMIC CONSIDERATIONS

If the pro-nuclear lobby was hoping that the weakness of its case on the wide range of safety questions would be partly offset by acceptance of the claims regarding the economic advantages of uranium mining and exports, then it must be terribly disconcerted by the findings of the Ranger Inquiry.

In the first place, the Commission has firmly rejected the argument that the industrialised Western world is currently facing or is likely to face in the foreseeable future a severe energy shortage. On the contrary, the Report explicitly states:

"... while the economies of countries heavily dependent on imported oil have been adversely affected by increase in world oil prices, it is incorrect to say that there is a presently existing world energy crisis which will create disastrous economic effects ..., and it is clear that it is incorrect to suggest that there are energy impoverished nations which need Australian uranium for survival." (p.164.) [Italics added]

In this regard, the Report makes the pertinent point that "total world coal resources are so large that they will not be approaching depletion for many decades, even if the rate of energy use continues to increase exponentially as it has this century" (p.164).

The only major immediate world problem in the energy field identified by the Commission is the availability of liquid fuels. If this is an accurate assessment of current energy needs, then it is difficult to disagree with the Commission's view that Australia's uranium can do little to improve the situation (p.164). The Report indicates that, without the use of fast breeder reactors reserves of uranium would amount to only about 5 per cent of presently estimated fossil fuels (p.39). It is precisely for this reason that the three Commissioners have argued that the most valuable contribution that Australia could make would be to concentrate on such alternatives as the production of liquid fuels from coal and the provision of coal at economic prices as a replacement for oil. In the longer term, the Commission advocates the development of technology to utilise solar energy with a view both to low and intermediate grade heat applications as well as electricity generation.

In addition to its stress on the need for the rapid development of alternative energy resources other than nuclear power, the Commission repeatedly emphasises the value and the feasibility of energy conservation. It notes that "the major energy consuming nations have embarked on energy conservation programs of varying intensity, and that they are being given high priority" (p.34). Extrapolating from present trends, the Report predicts that energy conservation "will have a significant effect on total energy consumption by the end of the century" (p.35). Believing that "societies may come to value more highly in the future things not included in conventional measurements of economic activity" (p.33) and that zero economic growth may become a socially feasible and desirable goal, the Commission advocates the introduction of additional policy measures "to achieve desired reductions in the growth of energy consumption" (p.35) and makes one of its
principal recommendations a national program of energy conservation (p.186).

Another argument suitably squashed by the Report is the preposterous suggestion that nuclear energy is likely to solve the economic problems of underdeveloped countries. According to IAEA projections, which have had to be revised downwards, by the year 2000 the Third World would still account for only 10 per cent of world nuclear capacity (p.53). The obvious point to note about these countries is that large power generating units are not suited to their needs, and that the much smaller units required are generally uneconomic if based on nuclear power. Where nuclear energy grids exist they are more likely to supply electricity for the affluent minority in the cities than the rural masses. Accordingly, the Commission’s main recommendation in relation to underdeveloped countries is not for Australia to make available its uranium resources but rather to participate “in international efforts to develop those forms of solar energy technology most suited to the needs of developing countries” (p.56).

Advocates of nuclear power often advance the alternative argument that its widespread use in the developed countries will indirectly help the developing countries. The Commission has little confidence in the discredited theories of capitalist economic development from which this argument is derived: “Nor does it appear that the further development of nuclear power in economically advanced countries will make any significant difference to the ability or willingness of those countries to assist less affluent countries”. (p.56)

Regarding the future of the nuclear industry in the advanced industrial countries, the Report once again presents a much less optimistic picture than the pro-nuclear propaganda would suggest. Having noted the marked reduction in the number of new orders for nuclear power stations which occurred during 1974 and 1975, the Commission goes on to indicate the high probability of a reduced rate of commissioning of new stations during the next decade (p.45). Apart from the depressed demand for electricity since 1973, the Report explains this trend by reference to the large increases in the capital costs of building and commissioning nuclear stations in recent years (p.48). According to an OECD study, the total capital investment required for energy programs may thus be so high as to conflict with other economic objectives. In the view of the Commission:

“... electricity authorities generally may experience difficulties in raising finance
for heavy capital expenditures in the decade ahead .... since nuclear plants are more capital-intensive than coal-fired plants, it seems probable that the relative cost position of nuclear plants may be adversely affected by these financing difficulties.” (p.48.)

The Commission also questions the cost efficiency of large nuclear stations and concludes that “smaller-scale coal-fired generating plants may prove to be more economic than large coal-fired or nuclear generating units” (p.49).

Problems with other stages of the nuclear fuel cycle are also contributing to doubts about the economic competitiveness of nuclear generation of electricity. Present enrichment costs are heavily subsidised by governments (all enrichment plants at present in commercial operation were built for military purposes - p.27), and it is thought that the real cost of enrichment is at least twice what is charged at present (p.50). A number of governments in Western Europe are financing the construction of new enrichment plants (p.27), but efforts in the USA to induce private companies to put up the money have so far been unsuccessful (p.29) - hardly a vote of confidence in the nuclear industry by the huge transnational corporations involved. The status of reprocessing of spent fuel is even more uncertain. At present there are no plants in operation capable of reprocessing oxide fuel (the type used in the great majority of power reactors) and some severe technical problems have been encountered (p.29). If and when these problems are overcome, it appears that reprocessing will not be a profitable operation by itself, which means that the cost of nuclear electricity will be further increased (p.50).

As for the direct benefits that are likely to accrue to Australia for the sale of uranium, the report estimates that additions to national income generated by uranium exports would rise from less than 0.1 per cent of projected national income in 1980-81 to about 0.5 per cent in 1990-91, and would fall to about 0.4 per cent by the end of the century (p.79). In relation to foreign exchange earnings, it is estimated that uranium exports would grow to 5 per cent of total earnings in 1991-92 but would subsequently decline to about 3.4 per cent at the end of the century. In this context it is worth noting that the Commission rejects as too high the estimates of potential Australian uranium sales presented to it by the Australian Uranium Producers Forum, the Australian Atomic Energy Commission and Pancontinental Mining Ltd. (p.66). It should also be noted that these estimates of the contribution to national income and export revenue are based on an assumed production and sale of 30,000 tonnes of uranium per year, which is 10 times the proposed initial Ranger production; it could only be attained if all the presently known uranium deposits were mined at full capacity, plus another two or three new discoveries the size of Pancontinental’s Jabiluka. Thus it could be regarded as a rather optimistic projection. Even more sobering are the Inquiry’s findings in relation to the possible contribution to employment. It is calculated that at an initial production rate of 3,000 tonnes of U3O8 per year, the Ranger operations would employ about 600 during the construction period of two years. Thereafter, the operation would employ 250 people. Even if production were doubled, the impact on manpower requirements would be minimal, resulting in additional employment for 400 people in the first two years and 150 people thereafter (p.77). To the extent that the operation would draw largely on skilled or semi-skilled workers from the south, the mining of uranium cannot be expected to have anything but the most negligible effect on the national or even local level of unemployment.

**FUTURE ACTION**

Given the magnitude of the dangers and costs of nuclear power and the extremely limited benefits that Australia or the international community are likely to derive from a policy of uranium exports, it is hardly surprising that the First Ranger Report should have shown so little enthusiasm for the proposal. Not only does the Commission give no clear go-ahead for the mining and sale of uranium, not only does it make any positive decision conditional on stringent controls and safeguards, but it goes to very considerable lengths to recommend specific courses of action which, if adopted, would obviously conflict both logically and practically with any policy designed to assist the expansion of nuclear production.
On the question of regulation, the Commission stresses the need for strong central government control over all activities relating to the nuclear power industry. Such controls should be such as to ensure that the government can, at any time, immediately terminate those activities, permanently, indefinitely or for a specified period (p.185). Moreover, the Commission stresses that such controls may have to be applied irrespective of the economic disadvantages for the mining interests. Should it be concluded that the government does not have the strength to resist these pressures, then the Commission believes that the only proper course would be to refrain from any mining development (p.183). Other controls must fulfil the following objectives (pp.182-3):

* careful selection of the countries to be supplied regardless of the international tensions that such discrimination might create
* maintenance of production and price stability
* pressures from the mining industry must not be allowed to determine the course to be followed in relation to the hazards of nuclear power.
* adherence to all treaty obligations
* resale by a purchaser of Australian yellowcake to take place with Australian approval

The government must be satisfied in advance that the conversion or enrichment of Australian uranium will not create serious hazards
* the entire policy is to be subject to frequent Parliamentary decisions and consideration.

Complementing these proposed conditions, the Commission has outlined a positive program of measures, the net effect of which would be to prevent or seriously mitigate against uranium mining and exports. These include (pp.183-6):

* the establishment of a Uranium Advisory Council to assist the government in relation to all the environmental aspects covered by the Report. The Council is to command public confidence, to report to Parliament, and the majority of its members are not to be involved in the nuclear industry or the promotion of nuclear power
* initiatives to ensure that the public is kept fully informed of relevant facts, for which purpose it is strongly recommended that frequent debates take place not only in the Federal Parliament but in State Parliaments and Territory legislative bodies.
* periodical review of policies by a body independent of government and with adequate access to the public
* the establishment of the machinery for the development of regular review of a national energy policy
* immediate steps to institute full and energetic programs of research and development into alternative energy sources
* a national program of energy conservation
* ample time for public consideration of the Report and debate upon it.

This last recommendation is, in fact, at the heart of the whole issue. For it emphasises the need to reach a decision that is in full accord with the democratic process. For this purpose, the ordinary people must be made aware of the relevant facts. But there is much more to it than that. To be in command of the facts is one thing, to arrive at a considered and responsible judgment in relation to the facts is quite another. It is highly significant that after one year of solid deliberation, the Commission, composed of three distinguished men and assisted by several experts and advisers, was not able to determine "whether it is preferable to delay coming to a decision about mining for a period of several years or alternatively to proceed with carefully planned development of the industry" (p.181). Given the gravity, the complexity and the unforeseeable consequences of the nuclear project, it is only prudence and common sense to insist that any decision should be preceded by the widest public and parliamentary debate. The responsibility is too large to be entrusted to interested parties in the nuclear industry, to the experts or to the government. What is at stake is not only the future of this generation but that of countless generations yet unborn.