

AUSTRALIAN NUCLEAR FORUM

ANSTO – Time for Change

Policy

The ANF proposes that consideration be given to the reorganisation of ANSTO into three separate organisations with these functions:

1. Nuclear Research and Development,
2. Reactor Operations, and
3. Commercial Products and Services.

(Adopted 27/10/04, Updated 9/9/12)

Summary and Conclusions

ANSTO carries out three different functions: nuclear R&D, restricted by the ANSTO Act; radioisotope production, importation and sales; and the operation of a national irradiation facility. The differences are identified below. The ANF believes that these differences are so great that the interest of the nation may be better served by dividing ANSTO into three separate organisations, corresponding to the three areas of responsibility.

We also suggest that:

- The scope of ANSTO R&D now excludes nuclear power matters, however it is recommended that this policy be overturned and suitable efforts be directed toward developing and maintaining an understanding of all aspects of nuclear science and its peaceful applications. This would place the organisation in a position to be involved in current and future developments in the field that offer advantages to this country.
- The radioisotope production be set up as an independent commercial entity on the lines of the CSL: Commercial products and services would also assume the role of providing training and education to the site personnel, to the Australian public and to overseas participants on subjects of importance in the field.
- The reactor be operated as a national facility by a separately funded organisation

The propositions mentioned above assume that the organisation will continue as at present as a hybrid relation of the Australian Public Service. An alternative worth exploring is to turn the management of the organisation over to an external prime contractor(s) that could apply private industry management methods and would thus increase the value of the overall organisation to the nation.

Considerations

1. Introduction

The AAEC was formed by the Commonwealth under the defense powers given by the Constitution. It was set up as an applied nuclear research and development organisation. In that role it became involved in, amongst other things, mining, refining, separating and enriching uranium, reactor fuels, reactor systems and design and nuclear waste management. These major programmes, though requiring scientific R&D, were of an engineering nature. Much research was expected to require the determination of properties of materials during irradiation. From the outset a materials test reactor, HIFAR, provided irradiation facilities and neutron beams to that end. Over time the reactor became useful for the development of the radioisotope industry, eventually irradiating the isotope targets on a production basis with other commercial work.

With the abandonment of the major programmes of the AAEC and the replacement of that Commission by ANSTO, the laboratory changed direction from engineering towards science. This change is illustrated by, amongst other things, the justification of the ANSTO act as " the need to formalise the change in direction " ... away from nuclear power oriented activities ...

towards peaceful applications of nuclear science" (ref.1). A semi-centennial review of highlights (ref. 2) confirms that this change is complete.

Turning to radioisotopes, there is now, and has been for many years, a substantial commercial production of radioisotopes by a quasi-autonomous Isotope Division.

As for the role of the reactor, it has evolved from being a tool for the scientists and engineers at the LHRL to become a national irradiation facility and neutron source.

2. Current ANSTO Configuration

From Appendix 3 of the ANSTO annual report of 2002-03, (ref. 4), ANSTO has two primary functions: (a) to undertake research and development in nuclear science and technology and the production and use of radioisotopes, and (b) to produce and trade in radioisotopes. To this should be added: (c) the operation of a reactor as a national neutron source.

ANSTO executes the main R and D function by operating a research laboratory. The activity is characterised by; (a) being project based; (b) having a wide range of activities; (c) being fundamentally a cost centre, but with some profits from some projects; (d) having a science orientation; (e) requiring mainly scientists and laboratory staff; and (f) contracting employees for projects.

It executes the second function by running an isotope factory with all the usual associated activities (i.e. sales, QA, licensing, production, packing, dispatch, etc.). This activity is characterised by: (a) being activity based, (i.e. the production of radioisotopes for medicine and industry); (b) a narrow range of activities (but a significant range of products); (c) being a profit centre, (d) having market orientation; (e) requiring professional, paraprofessional and other staff with a variety of skills; and (f) being suitable for permanent employees for ongoing activities and contract staff for any special projects.

The production of radioisotopes and neutron beams involves the operation of the research reactor OPAL. This last function is characterised by: (a) being activity based; (b) a single activity, (the operation of a national facility); (c) being a cost centre; (d) having output orientation; (e) using engineering and technical staff; (f) being suitable for permanent employment for virtually all staff (because the operation is ongoing and the training costs are high).

3. Suggested New configuration

3.1 Nuclear Research and Development

The primary purpose of ANSTO has been to carry out research and development in nuclear science. Staffing for such a function necessarily involves high level scientific talent together with sufficient funds and facilities to pursue projects of scientific and commercial interest.

In this way this function is similar to a university without students although the existence of such an organisation would also provide opportunities for such students to access facilities. The finance for such an organisation should continue to come primarily from the Commonwealth, but supplemented by income from contracting R&D on behalf of outside organisations.

While the need to pursue nuclear science R&D remains, the organisation for it would be similar to the present day ANSTO, but it is recommended that it be without reactor operating or isotope production responsibilities. The role then is similar to that of CSIRO, which has a strong presence at the LHRL. Given this situation consideration should be given to a merger. We understand that there was a proposal to amalgamate the AAEC with CSIRO in the past, but this foundered because the latter organisation did not want to be associated with nuclear reactor matters.

Thus it is suggested that the amalgamation be reconsidered for the ANSTO R&D only. The

previous CSIRO reservation would no longer apply because the amalgamation would include neither the reactor nor the isotope production. In effect, ANSTO R&D would become a division of nuclear science in the existing CSIRO. This could be of benefit to CSIRO by giving better access to the nuclear science skills of ANSTO but would give ex-ANSTO better access to the non-nuclear science skills of CSIRO.

However, since such an amalgamation with CSIRO will probably not happen, the studentless university concept could be expanded further to include the function of devoting some staff effort to developing and maintaining an understanding of the current developments in nuclear science and engineering worldwide. The purpose of such a program would be to provide a central point in the country where local researchers and the government could obtain well-based information about trends in the field that could be of value to this nation. Such a concentration of expertise could also be utilised by the education and training effort in the commercial products and services area.

3.2 Reactor Operations

The research reactor OPAL constitutes a national neutron source for science and industry. The operation of a reactor is primarily an industrial activity - similar in many ways to the operation of, say, a petroleum refinery. The primary goal is to operate the reactor to meet the needs of the customers efficiently. Normally, this means to operate the reactor at optimum power for the optimum time. This, of course, must also be done at the minimum cost commensurate with safety and the operating license. The reactor staff comprises engineers, technicians for operation and maintenance and applied science professionals for specialist advice on reactor physics, chemistry and radiation safety. Such an operation lends itself to a fixed establishment (a concept ill served under both the AAEC and ANSTO administrations) and long term funding.

The reactor would provide irradiation services to the Commercial Products and Services organisation and to any other commercial users, foreign or domestic, and make appropriate charges. However, we have examined the question of charging research projects for beam use in the new reactor, but concluded that would be neither practicable nor in the national interest (ref. 5). Thus the reactor would not earn enough from outside sources and would have to be financed primarily by the Commonwealth.

3.3 Commercial Products and Services

The major commercial products operation within ANSTO is the production of radioisotopes and radio pharmaceuticals. This has operated successfully as a semi-autonomous entity within ANSTO for many years. Under the suggested reorganisation this operation would buy irradiation services from the reactor organisation at agreed rates and products sold at market rates consistent with the Federal Government "Competitive Neutrality Policy" (see ref 6 for Productivity Commission findings against ANSTO in the costings of its PET products).

Similarly the irradiation services for NAA and for the irradiation of NTD silicon ingots would also be charged. Such activities are commercial and thus should not be subsidised.

There remains the question of LHRL site services. This responsibility could remain with the main tenant of the site, that is ANSTO R&D or CSIRO as the case may be. On the other hand, it has the characteristics of an engineering service and could well pass to the reactor organisation.

Another function of this operation would be to provide education and training to site personnel plus domestic and overseas participants. Such a function was operated before in the years of the AAEC but was essentially ended under ANSTO. Operation of this function would make use of personnel hired from Research and Development, and Reactor Operations functions as well as outside personnel as required. This function could do much to increase the understanding of nuclear science and technology in the general community and enhance connections with overseas entities.

3.4 Possible Utilisation of Private Enterprise Management

During WWII when the US government hurriedly embarked on the Manhattan project it realised that it did not have the expertise to manage such a complex project. To achieve this end they employed the concept of contracting private companies to use their management and technical skills to accomplish the desired goals. These contractors (e.g. duPont – Hanford, Union Carbide – Oak Ridge, U California – Los Alamos, U-Chicago - Argonne) conducted the US\$26 billion (today's \$) project for nominal profits. This method of conducting complex operations proved to be a success and it continues to this day with the USDOE using "facility management contractors" for all of its major sites.

The management system used initially for the AAEC was strongly influenced by the Australian Public Service and essentially all of the permanent employees were so classified. Such a system did not always prove advantageous for the career prospects of specialist employees, plus the organisational goals were very sensitive to policy swings of the government (e.g. stopping the Jervis Bay reactor project and banning centrifuge enrichment research). This uncertainty was described by Keith Alder former Director of the Research Establishment 1962-1970, " what actually happened was that our political masters kept changing the rules. Not just once or twice, but over and over again. In retrospect, I believe the AAEC and its staff showed great resilience in the face of constant politically motivated change, many of which were caused by ignorance-based dogma" (ref 7).

ANSTO is similarly operated although the employees are employed directly by ANSTO and many more temporary employees are used, although the government bureaucracy's methods plus Governmental changes in policy (e.g. stopping research related to nuclear power technology) are still very influential. Understandably the difficult operational climate that the AAEC/ANSTO has had to exist in has created problems in identifying and pursuing useful goals for the organisation. This situation has occasionally led to the use of outside management consultants such as AECL of Canada regarding the operation of HIFAR in 1990, and more recently a review of ANSTO general management procedures (ref. 8). Further, in the hopeful words of this latter consultant "ANSTO now has an explicit and transparent organisational approach to project governance – one which ensures streamlined and timely deployment, provides for ongoing evaluation of performance and enables efficient and effective decision making".

Regardless of the above sentiment the utilisation of one or more private enterprises to maintain and operate the functions of ANSTO is a method that would be worth exploring. However, to be successful the ground rules for such operations would have to be firmly established to provide long-term security of purpose – and not be subject to the vagaries of politics, or the influence of the government bureaucracy.

4. References

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7. "Australia's Uranium Opportunities: How Her Scientists and Engineers Tried to Bring Her into the Nuclear Age But were Stymied by Politics" K. Alder, 1996.
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