

## RECOMMENDATIONS

The following recommendations are based on the assumption that the Federal Government will provide the leadership required for a National Fusion Program and that arrangements will be worked out with interested provinces as appropriate. The recommendations deal with the following:

### 1. Development of National Capability

In order for a National Fusion Program to be credible on an international scale, well coordinated major projects with adequate facilities are necessary as focal points. As there are a number of promising approaches to the development of fusion energy, a selective program in three areas is recommended as optimum. These are:

- a) Inertial Confinement - a laser fusion facility with emphasis on CO<sub>2</sub> lasers be established as a national facility building upon the NRC laser capability. Canadian industry has internationally recognized expertise in CO<sub>2</sub> lasers making this area an obvious one for significant industrial involvement. This centre would be structured so as to encourage scientists and engineers from government, universities and industry to participate in a major way. A key requirement is proper facilities including a higher power laser system than currently exists in Canada. A study to define such a facility is in progress. Institutions from at least two provinces have expressed the desire to host such a centre and the possibility exists of financial assistance from the provinces for construction of such a facility.
- b) Magnetic Confinement - a Tokamak fusion facility be established at IREQ (Hydro-Quebec), Varennes and be operated as a national facility. The facility would be used for the study of the technological problems associated with future Tokamak machines such as long duty cycle operation and coupling to the electrical grid. A conceptual design study based on a new approach of multiple rapid short pulse operation to simulate the above is nearing completion. This idea could be implemented by Canada in the immediate future thereby enabling Canada to establish a presence in the international fusion effort. Hydro-Quebec is currently making a major investment in the conceptual design study.
- c) Selected Technologies - specialize in selected engineering technologies associated with fusion power systems. A study is underway to evaluate options for specialization in the engineering technologies of fusion power systems and to identify one or two preferred options. Such options will exploit indigenous Canadian expertise, provide engineering support to the above confinement facilities, and serve as a focus for international collaboration in the engineering of fusion power systems. One possible specialization which would exploit recognized Canadian expertise and which has attracted U.S. attention is fusion fuel production and handling.