

The geodetic framework, which is the responsibility of the Surveys and Mapping Branch, consists of tens of thousands of precisely located points and is essential to all other surveys and studies of the earth, as well as for most large engineering projects. Multi-purpose topographic mapping is the foundation of a host of federal and national activities such as resource development, transportation, communications, urban and rural administration, education, defence and recreation.

The growing technology of remote sensing from satellites and aircraft is used by the Canadian Centre for Remote Sensing to provide data for such activities as ice reconnaissance, crop forecasting and forest fire prevention.

Department of National Defence

9.2.7

R&D projects for the Department of National Defence are varied and often have important applications in areas other than defence. Many projects relate to the defence of Canada's frontiers, especially the North, involving such problems as human and machine adaptation to extreme cold. Testing and standardization activities for the department are conducted primarily by the test and evaluation establishments of the Canadian Armed Forces.

The main responsibility for science and technology rests with the Research and Development Branch. The branch is establishing a broad technology base which will be maintained in the six Defence Research Establishments across Canada, in industry and in other departments and agencies. In line with the contracting-out policy, external resources are used whenever practical, but in many areas vital to defence the technology base is maintained in-house. Outside contractors are used, where possible, to provide advice on military training or operations and on human performance in the military environment. They are also used for equipment-related activities, ranging from demonstrations of feasibility, through development, to performance evaluation and engineering tests.

One program conducted by the Defence Research Establishments (DRE) is the Technical Program on the Acoustic Detection of Submarines. This program is carried out jointly by the DRE Atlantic and the DRE Pacific in the three oceans bordering Canada, using research ships and scientific equipment developed mainly by the DRE. The program aims to improve the military ability for reconnaissance, location and surveillance of submarines in waters of Canadian interest. It is concerned with all aspects of underwater acoustic propagation: natural and man-made interfering noise, signal processing and analysis, and transducer technology. International cooperation and information exchange are important parts of the program.

One important role of the technology base is to provide the background for development. The Penetrating Rocket System is an example. This improved air-to-ground rocket uses a high-performance composite propellant in which DRE Valcartier had developed expertise. Canadian industry had the necessary technical background and the production facilities, having produced earlier rockets for the Valcartier program. When the Canadian Forces saw the need for an improved rocket in 1972, Canada had the capability to design, develop and manufacture it. DRE Valcartier designed the rocket motor and produced initial models. Industry then produced a prototype lot of 60 which was successfully test fired, indicating that the technology had been satisfactorily transferred from government laboratory to industry. Then followed pre-production models, performance testing at the Aerospace Engineering Test Establishment and the development of operating procedures. The rocket was cleared for use on the CF-104 aircraft and clearance trails for other aircraft were initiated. In January 1976 the department let a production contract for rocket motors to meet the CF-104 requirement, and some NATO countries expressed an interest in the weapon.

Department of Industry, Trade and Commerce

9.2.8

A major function of the Department of Industry, Trade and Commerce is to assist product and process development and to increase productivity in Canadian