

Partners with industry

The Division of Mechanical Engineering

Utilizing the properties of matter and the sources of energy in Nature to build machines and tools is as old as humanity itself. It's an activity we call mechanical engineering, and it is the subject area of one of NRC's earliest research enterprises. The Division of Mechanical Engineering, or DME, was formed back in 1935 to serve the needs of Canadian industry, with emphasis on aviation technology.

Through the Second World War and postwar period the Division grew from barely a dozen engineers to become the largest Division in NRC. In 1959 it was formally divided into the National Aeronautical Establishment and the Division of Mechanical Engineering, but the two continue to share common interests. Responsibility for aircraft engines, for example, and propulsion systems generally, remains in the Division of Mechanical Engineering. With its extensive experimental facilities and the broad range of expertise of its personnel, DME plays an important role in promoting technological advancement and improving the productivity of Canadian industry.

The Division's main research facilities are in Ottawa at NRC's Montreal Road campus and the Uplands Airport complex. A section of the Division is also located in Vancouver to serve the needs of the western provinces, and an

eastern laboratory, the Arctic Vessel and Marine Research Institute, is under construction in St. John's, Newfoundland. With its world-class ice tank facilities, the new Institute will give Canada a vital research base for developing the technology to work and travel through ice-covered waters.

DME projects are, for the most part, closely allied to Canadian engineering needs. They vary enormously in scale, from the development of microscopic surgical instruments, the operation of huge machines that test railway cars by banging, squeezing and shaking them, to the building of scale models of entities as large as the St. Lawrence River system.

In addition to its own research, DME provides engineering facilities available nowhere else in Canada. The Division's Manufacturing Technology Centre has gear-grinding and other metal-working apparatus not yet found in private Canadian industry. Among the Centre's specialities are electron beam welding, laser welding, and the electrochemical machining of materials.

Other enterprises include ship-model towing tanks complete with a model-building shop. DME's unique engine test cells, combustion facilities and cold chambers have contributed to the development and certification of Canadian-made aircraft and industrial gas turbine

engines. Large-scale vibration equipment and squeeze frames allow railroad equipment manufacturers to develop vehicles that meet standards for interchange service on both Canadian and U.S. railroads.

Nearly half of DME research is related to transportation, much of which is aimed at improving the energy efficiency of propulsion systems. DME research in support of manufacturing and productivity (like its computer-assisted control systems for steel and copper mills) account for about a quarter of the Division's activity and is expected to grow further. Other major research interests are in non-transportation energy requirements and oceans technology.

The following picture story reflects the general nature of DME's research enterprise.

Michel Brochu

In cooperation with Canadian manufacturers of automotive equipment, the Engine Laboratory is studying energy-efficient car fans and radiators using full-scale wind tunnel testing techniques. (Photo: Division of Mechanical Engineering)

En collaboration avec des manufacturiers canadiens de pièces d'automobiles, le laboratoire des moteurs étudie des ventilateurs et des radiateurs d'automobiles consommant moins d'énergie; les nouvelles méthodes expérimentales font appel à des essais portant sur des voitures complètes placées dans une soufflerie. (Photo: Division de génie mécanique)

