UNUSUAL EQUIPMENT CHALLENGES SKILLS OF TRIUMF’S MACHINE SHOP AND LOCAL COMPANIES

TRIUMF’s machine shop employs highly skilled staff and utilizes specialized equipment to produce the unique research apparatus required for sub-atomic physics experiments. During the past year, TRIUMF’s machine shop has subcontracted jobs to local companies, to the value of over $800,000. This total does not include tools and materials, or contracts over $25,000.

Roland Roper, head of the machine shop, is in charge of subcontracting the overflow jobs. At any one time there are 30 - 35 subcontracts in progress. Roper prefers dealing with local companies because it allows him to visit and oversee their work regularly; he visits about 20 - 25 companies in the Vancouver area each week. The value of outsourced machine shop jobs has grown 300% over the past four years from $200,000 in 1994. This increase is attributed to the construction of equipment needed for the new ISAC (Isotope Separator and ACcelerator) facility.

The ISAC facility will use apparatus such as the Drift Tube Linac (DTL) shown in Figure 1. The copper structures, built by Talvan Machine Shop, are internal components of the DTL tank. This vacuum tank was built by Sunrise Engineering. At the tips of the fork-like structures are small holes through which the beam-line passes as it is accelerated.

TRIUMF subcontracted work to several companies to build the RFQ (Radio Frequency Quadrapole) accelerator (Figure 2). The rings, built of copper, required precision spinning which was done by Siges Spinning. Complicated water-cooled electrodes and electrode holders were manufactured by Sicom Industries on numerically controlled milling machines from computer generated data supplied by the TRIUMF Beam Dynamics Group. The tank was built by Sunrise Engineering, the copper plating was done by Superior Electro Plating, and EDM Wire Specialists completed the final machining. TRIUMF works closely with the local companies to overcome

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any technical challenges, involved in constructing this highly specialized equipment. In some cases technology transferred by TRIUMF has led to a company diversifying into new products. Many of these local companies maintain that working with TRIUMF has given them a competitive advantage, in helping keep their technology at par or above that of competitors in the U.S. and abroad.

The TRIUMF machine shop owns and operates an Electron Beam Welder - a highly sophisticated and specialized device capable of welding, with detail and extreme accuracy, metal as thin as 1/3000 of an inch thick (about 1/10 the thickness of a single stand of hair). It is one of only two Electron Beam Welders in Canada. Several local companies are working with TRIUMF on commercial applications of this technology.

The machine shop employs 22 people who manufacture specialized machine parts and equipment for TRIUMF researchers as well as other Canadian laboratories. For instance, components of the support structure for the Neutrino Chamber in the recently opened SNO (Sudbury Neutrino Observatory) Facility in Sudbury, Ontario, were manufactured at TRIUMF.

GOVERNMENT OFFICIALS VISIT TRIUMF

On Friday June 19, 1998, Deputy Minister of Industry Canada Kevin G. Lynch, along with Assistant Deputy Minister Andrei Sulzenko, and Executive Director Chummer Farina, visited TRIUMF. TRIUMF Director Alan Astbury, Assistant Director Jean-Michel Pouliot, TRIUMF Board of Management Chairman Colin Jones and Ewart Blackmore Head of the Accelerator Technology Division, took the visitors on a tour around TRIUMF and MDS Nordion. Among the sites visited was TRIUMF’s new ISAC (Isotope Separator and ACcelerator) facility.