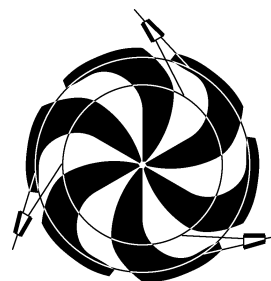


TRIUMF



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**CANADA'S NATIONAL LABORATORY
FOR PARTICLE AND NUCLEAR PHYSICS**

OPERATED AS A JOINT VENTURE

MEMBERS:

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THE UNIVERSITY OF TORONTO

UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

JULY 2000

The contributions on individual experiments in this report are outlines intended to demonstrate the extent of scientific activity at TRIUMF during the past year. The outlines are not publications and often contain preliminary results not intended, or not yet ready, for publication. Material from these reports should not be reproduced or quoted without permission from the authors.

ADMINISTRATION DIVISION

INTRODUCTION

During the current year the TRIUMF Administration Division was reorganized and integrated into the office of the Director. In order to streamline operations, the Manager of Human Resources and Administration, the Comptroller, the Manager of MIS and Telecommunications, and the Senior TRIUMF Safety Officer now report to the Director.

HUMAN RESOURCES AND ADMINISTRATION

This was the third year of our Performance Planning and Review process, whereby all employee performance was evaluated and measured site wide. A number of Personnel Policies and Procedures were approved by the TRIUMF Board of Management for implementation. An Employee Assistance Program was also introduced for all TRIUMF employees.

The insurance program was renewed with a premium reduction of 6.5% and third party liability coverage remains at \$50M. All buildings operated by TRIUMF are owned by the University of British Columbia and insurance coverage for these buildings and contents are covered by the Canadian Universities Reciprocal Insurance Exchange (CURIE).

During this period Carleton and Queen's universities formally became associate members of the Joint Venture and it is expected that Carleton will become a full member in 2000.

OPERATIONAL SAFETY

AECB Licensing

In January the AECB sent a five person team to assess TRIUMF's radiation protection program. Twenty-five staff members who either perform, supervise, or define the policies for potentially dose-intensive work were interviewed.

Several action notices were issued as a result of the assessment. One action notice requires TRIUMF to assess the need for group-specific radiological safety training, and to develop and deliver that training using a 'Systematic Approach to Training' (SAT). A second action notice requested that TRIUMF put in place a process to investigate incidents.

Representatives from each division attended an incident investigation training course late in September, but the training issue is still being addressed.

The AECB had also requested that TRIUMF analyze the prompt radiation hazards associated with high-intensity proton beams. A study group commissioned by the Head of the Cyclotron Division performed this analysis along with a qualitative assess-

ment of the adequacy and reliability of TRIUMF's radiation protection systems. The study group completed a report which made a number of recommendations where weaknesses were identified. A plan to implement many of the recommendations has been developed and submitted to the AECB.

The AECB issued an amended Operating Licence approving the irradiation of a beam line 2C5 Cs target for the purpose of producing ^{127}Xe . The Cs target is now licensed for proton beam currents up to $50\ \mu\text{A}$.

A licence to operate ISAC with proton beam currents of up to $10\ \mu\text{A}$ on any target up to $Z = 82$ was granted in time for beam production on a Nb target. The ISAC Safety Committee was instrumental in monitoring the compliance with conditions set by the licence.

AECB approval was also granted for a test on a high-power prototype Mo target in ISAC. No radioactive ion beams were produced during this test.

WCB and Site Environment

A major Machine Shop ventilation system upgrade was completed in the spring in response to a WCB order issued the previous year. Several other groups relocated to newer quarters with more effective ventilation. The Design Office group finally moved from Trailer S to the top floor of the ISAC Service Annex and the entire Carpentry Shop moved to a new location equipped with proper dust and fume handling equipment.

A 2,600 kg shipment of low specific activity radioactive waste was shipped to Chalk River Laboratory for disposal.

Training

Twenty-four individuals completed TRIUMF's Radiation Protection Course during the year. The course is conducted by TSG's Health Physicist and the Radioactive Materials Coordinator. Staff must successfully complete the course to obtain Atomic Radiation Worker status.

TSG's Industrial Safety Officer arranged for a number of training courses to be presented at TRIUMF including Level 1 First Aid Certification, chemical safety in the laboratory, the use of fire extinguishers, and the administration of a Workplace Hazardous Materials Information System.

Interlocks and Monitoring

A significant amount of effort was expended to complete tasks crucial to the operation of the ISAC facility.

A new radioactive ion beam radiation monitoring system based on EPICS software was commissioned

and the first five detectors were installed near TRI-NAT and in the ISAC target maintenance hall. The new system drives local visual and audible alarms and is also interlocked to shut down the radioactive ion beam if excessive beam loss is detected.

The ISAC target maintenance hall area safety unit, lockup, and crane interface were also designed and installed.

The work required to make all engineered safety systems Y2K compliant was completed late in the year. The portable PC-based gamma spectroscopy system was upgraded to run Windows 98 as part of the general upgrade.

Personnel Dosimetry

The TRIUMF collective dose for 1999 was 309 mSv as measured by the TSG direct reading dosimeter (DRD) service. This dose is higher than the collective dose for 1998, when many service groups were involved in building the ISAC facility. This work did not result in any radiation exposure. The dose for 1999 was, however, considerably lower than the collective dose for 1997 (424 mSv).

Table XXXI shows the breakdown of the collective dose by various groups.

Table XXXI. Collective dose for TRIUMF personnel by group.

Group	Dose (mSv)	Fraction of Total (%)	Median (mSv)
Applied Tech	103.4	33.4	5.7
Beam Lines/Probes	10.1	3.3	1.2
Experimenters	5.1	1.7	0.1
500 MeV Operations	22.0	7.1	1.0
Life Sciences	27.7	8.9	2.5
Mech Engineering	3.8	1.2	0.5
Outside Contractors	10.7	3.5	0.3
Plant Group	17.4	5.6	0.5
RF Group	4.0	1.3	0.5
Remote Handling	29.4	9.5	3.3
Safety Group	17.2	5.6	0.9
Tech Support	12.6	4.1	0.8
Vacuum	9.7	3.1	0.8
Others	36.4	11.7	—
Total	309.5	100	0.3

ADMINISTRATION COMPUTING

Data Processing

Both software and hardware improvements were made to the IBM AS/400 system that is used for administration data processing. The operating system and associated software were upgraded (to Version 4 Release 3 in February, and to Version 4 Release 4 in September), and additional memory and disk space were added towards the end of the year. As a result,

system performance was improved considerably, with the most noticeable (and most needed!) changes being in Web serving.

In February, a review process was initiated to review and update or replace the database and application programs for Human Resources. This process was still ongoing at year end. Interim changes were also made to the current HR applications and database, both to support the TRIUMF PPR (Performance Planning and Review) and the policy changes regarding staff vacations.

Application software was updated to support Web-based payments for those attending the 3ICI conference (this software was based on that previously used for the ICHEP'98 conference).

Word Processing

Word processing systems saw only minor changes in 1999. Software both on client PCs and on the administration servers was refreshed, and one new client PC was added to the network.

Telephones and Telecommunications

The site telephone system experienced frequent technical problems until September. At the start of the year, these problems were quite inconvenient but not particularly severe, often requiring only a system restart. It was believed that these problems were likely due to the UPS not being large enough to handle the telephone switch and voicemail systems simultaneously. In February, the existing UPS was serviced and a second one was added.

Through the next few months, various hardware components of the switch failed and required replacement. These failures caused more significant outages, with the worst occurrence lasting several days. It was initially suggested that these hardware failures might be a consequence of environmental factors in prior years (water spillage from a leaky air conditioner, and excessive heat once that air conditioner was turned off). However, further testing determined that a major cause was that the output voltage of the new UPS was too high. Once this was corrected, no further outages occurred.

In the 1999 budget year, costs for long-distance phone calls were reduced by approximately 50%. This was due both to a change of long-distance carrier and to more stringent monitoring of lengthy international personal calls made outside working hours.

During the year, the phone switch approached maximum capacity. Many new telephone locals were required in the ISAC building, but most of these had to be accommodated by moving existing locals. By year end, plans were being prepared to expand the switch in the new budget year.