

TRIUMF



ANNUAL REPORT SCIENTIFIC ACTIVITIES 1998

CANADA'S NATIONAL MESON FACILITY
OPERATED AS A JOINT VENTURE BY:

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SIMON FRASER UNIVERSITY
UNIVERSITY OF VICTORIA
UNIVERSITY OF BRITISH COLUMBIA

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CARLETON UNIVERSITY
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UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

APRIL 1999

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

In 1998 TRIUMF discontinued the use of the TRIUMF Safety Advisory Committee for providing advice, formally to the Director, on all personnel, public and environmental safety policies and procedures. A regime of divisional safety committees or panels, appointed for specific issues, has been implemented. The division head will chair the advisory committee or panel, make the final decisions on recommendations to the Director on the policies, procedures and facility designs to obtain safe operations in their division, and ensure their implementation.

All of the computer programs operated on the IBM AS/400 administration computing system are now Y2K compliant. Some PCs used in the word processing systems will require special action in January, 2000 if they have not been replaced before then. The only system still requiring program upgrading for the Y2K problems is our telephone system. This will be done when its ongoing viability is determined, before the end of 1999.

Long distance charges are now being billed directly by Fonorola at substantial savings in toll charges and billing administration costs.

OPERATIONAL SAFETY

Safety Organization

The long-standing TRIUMF Safety Advisory Committee was officially dismantled and replaced with a system of divisional safety committees. Each division head is now responsible for convening meetings of standing safety committees or temporary panels to review the personnel and public safety of operations within their division. Recommendations and decisions will be recorded in meeting minutes and filed with TRIUMF Safety group for archiving and auditing purposes.

AECB Licensing

The AECB has changed how it regulates activities at TRIUMF. An AECB Project Officer is now assigned to TRIUMF on a full-time basis, being assisted in his evaluation by other AECB groups with specific areas of expertise. TRIUMF and TSG now allocate more time to licence management and compliance documentation.

A TR13 shielding upgrade was completed in the spring allowing lithium targets to be irradiated at currents up to 50 μ A. The TR13 operating console was moved to the far corner of the fenced-in area later in the year, further reducing the dose-rate at the operator's table by more than a factor of two.

The AECB issued an amended Operating Licence approving both the lithium irradiations at the TR13 and the irradiation of a new target material at the TR30. The TR30 is now licensed for currents up to 650 μ A on the new target material.

The AECB reviewed documents pertaining to the Derived Release Limits for TRIUMF and ISAC. The documents were subsequently revised and reissued as TRIUMF Safety Note 2.4.3, Revision 2.

Site Security

Site security is still a concern although there were no major break-ins or significant material thefts during 1998. Cromwell Security Inc. continue to patrol the site daily.

Several lighting improvements were completed, including the installation of a new lamp standard on the road leading from the main office building to the upper parking lot.

WCB and Site Environmental

New Workers' Compensation Board Occupational Health and Safety Regulations are being put into effect. Some of these new WCB regulations are also concerned with ionizing radiation. Most of the new WCB requirements, such as the need for regularly scheduled monitoring and personnel dose management programs, are already covered by existing AECB licence requirements.

All industrial safety programs were expanded to include the new ISAC building. A new first aid room was commissioned, an approved fire safety plan was drawn up, and workplace hazardous materials information system (WHMIS) stations were established. The ISAC building was approved for occupancy late in the year.

A 10,000 kg shipment of low specific activity radioactive waste was shipped to Chalk River Laboratory for disposal in mid-December.

Interlocks and Monitoring

The 500 MeV Central Safety System was modified to include the access control and machine protect functions for beam line 2A and its associated exclusion areas. The documentation of access control functions and system requirements was further refined and several changes were made to the software to bring the program in line with the newly specified requirements.

All changes were formally tested and signed-off as part of a new system Quality Assurance program.

Six new air monitors, two new neutron monitors and five new beam spill monitors were commissioned

and connected to previously unused channels in the 500 MeV facility's radiation monitoring system. All monitors were associated with beam line 2A and the ISAC facility.

Safety-critical software and hardware were examined for year-2000 compliance. All radiation monitoring and access control data acquisition and display systems were found to be compliant. Some work will be required to ensure that the VAX-based data logging and PC-based gamma spectroscopy systems become Y2K certified before the end of 1999.

Personnel Dosimetry

The 1998 TRIUMF collective dose as measured by the TSG direct reading dosimeter service was 258 mSv, the lowest level in some years. The primary reason for the low dose is the involvement of many 500 MeV facility operational support groups in the construction and commissioning of the new ISAC facility. The facility was a non-radioactive area for most of the year.

The 1998 Applied Technology group personnel collective dose was approximately the same as in 1997. Applied Technology staff were not involved with the new ISAC facility, hence the group dose represents a higher percentage of the total site dose than in previous years.

Table XXIV. Collective DRD dose.

Group	Dose (mSv)	Fraction of Total (%)	Median (mSv)
Applied Technology	78.5	30.4	4.5
Beam Lines/Probes	9.0	3.5	1.3
Experimenters	4.0	1.6	0.1
500 MeV Operations	25.3	9.8	1.2
Life Sciences	28.6	11.1	0.4
Mech. Engineering	4.8	1.9	0.4
Outside Contractors	10.4	4.0	0.8
Plant Group	5.4	2.1	0.2
RF Group	6.4	2.5	0.6
Remote Handling	12.9	5.0	1.0
Safety Group	13.5	5.2	0.4
Tech Support	17.3	6.7	1.6
Vacuum	12.4	4.8	1.9
Others	29.9	11.6	—
Total	258.4	100	0.3

ADMINISTRATION COMPUTING

Data Processing

There were incremental changes to the IBM AS/400 computer system that is used for administration data processing. The operating system was upgraded to a Version 4 Release 2, and memory and disk storage were increased, which resulted in additional performance improvements and improved system utilities.

There was additional development of Web-based utilities. In support of the ICHEP'98 conference, a second, secure, Web-server was set up to process conference payments from attendees around the world. This was done in coordination with the main ICHEP data base system. On the original server, a number of new utilities such as an interactive, searchable and printable Stores catalogue were made available.

A prototype "paperless" system was implemented to report telephone long-distance usage. With this system, telephone billing information is transferred electronically into our data base. Account holders are automatically notified by email of the total cost of calls per authorization code, and account holders and callers can review the call-logs using a Web browser. It is expected that this will become the model for report distribution for any new applications on the administration system.

The year-2000 compliance project was completed this year. While all hardware and operating system software was already certified year-2000 compliant, all custom software (either developed in-house or purchased and modified) needed to be reviewed to ensure Y2K compliance, and many software modifications were required. The central data base also needed review and modification.

Word Processing

The word processing systems saw only incremental changes in 1998. All client PCs were refreshed with current versions of software to ensure that they all conformed to a single standardized configuration. All PCs were tested for year-2000 compatibility. PCs requiring special action in January, 2000, and those requiring replacement, were identified.

Telephones and Telecommunications

The major change to the site telephone system in 1998 was the implementation of an "automated switchboard", based on the existing voice mail system. Prior to this change, the switchboard operator was frequently overloaded with calls, causing many incoming calls to be queued for unacceptably long times. With the change in effect, only calls requiring a live attendant were transferred to the switchboard operator. The majority of calls, where the caller already knew the correct telephone local, could now be dialed directly by the caller. As expected, fewer calls had to wait in queues, and queue-waits were shortened.

Unfortunately, the automated switchboard placed significant additional load and dependence on the voice mail system. Over the past few years, the voice mail system had become less reliable, but failures had little impact. In 1998 failures not only became more frequent, but also lasted longer, and caused considerable

operational problems. In some cases, voice mail failures brought down the whole site telephone system. In another case, the voice mail component did not function for nearly a week.

It has proved impossible to be sure of the exact cause of the failures, however, it is clear that various environmental factors were likely culprits. At the start of the year, the room air conditioner occasionally leaked water on to the telephone processors. For much of the remainder of the year the faulty air conditioner was shut off, but installation of a new one was delayed. It was also determined that neither the site

power nor the telephone system UPS was providing an appropriate level of service.

Due to the age of the hardware, there were often significant delays in obtaining replacements, which were no longer being manufactured.

At the end of 1998, a new air conditioner was installed and power problems were being addressed. All hardware components of the voice mail system had been tested and suspect components were replaced. Since this was done, no additional failures have occurred.