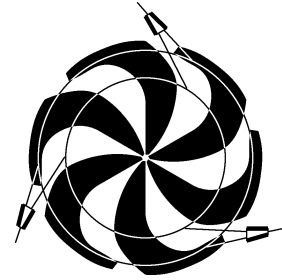


TRIUMF



ANNUAL REPORT SCIENTIFIC ACTIVITIES 2004

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

OPERATED AS A JOINT VENTURE

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UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

OCTOBER 2005

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

The Administration Division is made up of Human Resources and Administration, Accounting and Materials Control, Administrative Computing, and Safety. The manager of each group reports to the Director. A summary of Division activities is included in this report.

HUMAN RESOURCES AND ADMINISTRATION

All employees are reviewed for performance on an annual basis. The period covered for Performance Planning and Review coincides with the calendar year.

TRIUMF has a very strong student program and hires on average some 35 summer students per year in addition to approximately 10 university co-op students who are hired each term.

In 2004 TRIUMF awarded researcher emeritus status to two retired scientists. The researcher emeritus position is intended to mark the past accomplishments of retired researchers and to express TRIUMF's appreciation for their willingness to continue active research in TRIUMF related activities. Initial planning was completed for the establishment of a TRIUMF alumni group. All retired TRIUMF employees and regular visitors to TRIUMF will be eligible to become members of this alumni group. A Web site with relevant alumni information is currently being constructed.

The Administration Division maintains all long-term visitor information such as home institution, length of stay, contact person at TRIUMF, radiation badge, and keys issued.

The TRIUMF security card access system is working well with approximately 1100 active security cards. All employees and long-term visitors are required to wear a photo ID card. All short-term visitors, those visiting less than three weeks, are required to wear a Visitor badge. Security guard coverage continues between 6:00 pm and 6:00 am on working days with twenty-four hour coverage on weekends and statutory holidays. All vehicles accessing the site behind the security fence are required to have a permit.

The insurance program was renewed with an approximate 13% increase in premiums over the previous year as a result of market conditions. Third party liability coverage remains at \$50 M. All buildings operated by TRIUMF are owned by the University of British Columbia and insurance coverage for these buildings and contents is provided by the Canadian Universities Reciprocal Insurance Exchange (CURIE).

There are currently six full member and seven associate member universities in the Joint Venture. Ef-

fective April 1, 2004, the University of Toronto became a full member and on December 1, 2004, Saint Mary's University became an associate member.

TRIUMF complies with Federal Treasury Board requirements under a results-based Management and Accountability Framework. The purpose of this framework is to establish a mechanism to help the National Research Council (NRC) and TRIUMF: i) collect performance information related to this initiative; ii) track delivery of commitments and reporting; iii) describe how the success of TRIUMF will be evaluated over time; and iv) provide direction for on-going and future planning. No Management and Accountability Framework report was required to be submitted in 2004 due to the review of the reports submitted by TRIUMF to the NRC in support of TRIUMF's 5 year funding request for the period 2005-2010.

In 2004 TRIUMF completed construction of its new housing facility, TRIUMF House. This facility offers modern amenities in a soundproof environment that ensures visitors to TRIUMF enjoy their home away from home. Official occupancy began on December 13. Construction of this facility was completed earlier than scheduled and under budget.

ENVIRONMENT HEALTH AND SAFETY

Licensing

The latest version of the TRIUMF Preliminary Decommissioning Plan was accepted by the Canadian Nuclear Safety Commission (CNSC). Such a plan is a regulatory requirement under the new CNSC regulations for all nuclear facilities and must be accompanied by financial guarantees to cover the cost of eventual decommissioning. At year's end, TRIUMF was still negotiating the form of these guarantees with the federal government.

The TRIUMF Quality Management System as defined in the Quality Manual and ten TRIUMF Standard Operating Procedures (TSOPs) was accepted by the CNSC. These documents are available at <http://www.triumf.ca/EHS/> by clicking on "Quality Assurance". As part of the Quality Assurance program, the TRIUMF QA Assessment Team performed 13 internal assessments of compliance with the TSOPs of a number of TRIUMF groups. The assessments have been published as Internal Assessment Reports and are available to those TRIUMF users with an account on the TRIUMF Document Server <http://documents.triumf.ca/docushare/dsweb/HomePage>. A new list of assessments planned for 2005 was published at the end of the year.

Table LII. Collective dose for TRIUMF personnel by group.

Group	Dose (mSv)	Fraction of total (%)	Median (mSv)
Applied Technology	129.8	31.5	3.4
Remote Handling	33.7	8.2	3.2
500 MeV Operations	28.3	6.9	1.5
Safety Group	29.9	7.3	1.1
RF Group	16.8	4.1	0.7
Vacuum Group	30.8	7.5	4.4
Plant Group	31.6	7.7	0.6
Beam Lines/Probes	29.0	7.0	4.0
Tech Support	32.5	7.9	4.7
Life Sciences	28.3	6.9	0.7
ISAC Operations	8.4	2.0	0.2
Science Division	10.5	2.5	0.3
Outside Contractors	2.5	0.6	0.2
Others	24.7	5.6	—
Total	436.9	100.0	0.6

In September TRIUMF was visited by a team of IAEA inspectors to verify TRIUMF's compliance with international safeguards on nuclear materials. The inspectors examined all hot cells at TRIUMF and obtained swipes of the exterior for analysis.

Personnel Dosimetry

The collective dose for TRIUMF personnel for the year 2004 was 436.9 mSv as measured by the direct reading dosimeter service. Table LII shows the breakdown of the collective dose by various work groups. The collective dose was somewhat lower than for 2003. ISAC continues to make a relatively minor direct contribution to the collective dose.

Interlocks and Monitoring

ISAC B1 electrical room was interlocked to the 500 MeV Central Safety System and the ISAC DRAGON experimental area was interlocked to the Ion Beam Safety System. Both were commissioned early in the year.

Designs were completed for the ISAC-II Access Control System and the extension of the ISAC Radiation Monitoring System to ISAC-II. No funds were available to start installation within this fiscal year.

A design for a new prototype secondary channel area safety unit was started. This is in anticipation of a program to refurbish the meson channel interlock systems.

Occupational Health and Safety

All TRIUMF's Occupational Health and Safety Programs continued to run smoothly. The fire alarm system, sprinkler systems and fire extinguishers were all inspected and verified for 2005.

A workshop on ladder safety was presented in June after a rash of ladder related accidents. In order to address the possibility of falls in other areas such as, for example, working on the 500 MeV cyclotron jacking system, fall arrest equipment was purchased for use in these areas and training provided for its use.

ADMINISTRATION COMPUTING AND COMMUNICATIONS

Management Information Systems

No major changes were made to the MIS systems and database in 2004.

Public Web Services

Testing of the new TRIUMF Web server, <http://www.triumf.info/>, was completed, and it became the default public Web site in the last half of 2004. The site was set up with two home pages, one addressed to the general public, the other to TRIUMF users and employees. The former presents headline stories that may be of interest to outsiders, and has menu items that lead to areas of general interest. The Users and Employees home page, on the other hand, presents current site announcements and status information, and has menu items that lead to areas more specific to the TRIUMF community itself. In both cases, some menu items lead to pages that remain on the old Web server; it will be a continuing project to migrate and reorganize these Web pages onto the new Web server.

In 2004, additional Web based utilities were implemented to support on-line beam requests. Unlike previous forms, these new forms are interactive, in that the form structure varies depending on what type of beam request is being made. The forms themselves are fully database-driven, so that they can be adjusted as new experimental facilities are brought on-line. These forms were first used for beam schedule 106, and formed the second component of the Web beam scheduling tools (the first component, publishing the schedules, was completed in 2003).

Development continued on the third component of the beam scheduling tools, which will allow a schedule to be built directly from the request database, without having to print the requests and prepare the schedule off-line. This component is expected to have two interfaces – a graphic interface that uses timelines, and a spreadsheet-like interface. It is expected that this tool will be available for use in 2005.

The administration Web server, admin.triumf.ca, was used to support the registration and payment of three conferences in 2004: NIC-VIII, 5ISR, and WRNPPC. The NIC-VIII conference was the first to use the reusable conference forms, which will continue to be used for other conferences hosted by TRIUMF.

Telephones

No major changes were made to the site telephone infrastructure during 2004. Towards the end of the year, planning was started on how to provide telephone service to the new TRIUMF House. The decision was made to add TRIUMF House to the existing TRIUMF telephone system rather than install an independent system. The TRIUMF House portion would be connected to the main site using IP telephony, which would also allow sharing of infrastructure with the TRIUMF House data network. This would be the first use of IP telephony for TRIUMF, and in future, the same technology may be used within the main site as well.

TRIUMF OUTREACH PROGRAM

The TRIUMF Outreach Program (TOP) continues to evolve and grow in its second year, after being officially launched in 2003 with generous grants from the Vancouver Foundation and the TRIUMF Technology Transfer office. TOP has been focusing its outreach efforts on high school students and teachers, as well as the general public, and good progress has been made in all of these areas.

The high school teacher internship program has continued to attract keen interest from teachers across BC, with 7 teachers having participated in TRIUMF experiments so far and over a dozen more on the waiting list. We expect this program to attract 3–6 teachers a year to TRIUMF for years to come.

TRIUMF/ISCBC High School Fellowship

In 2004, TRIUMF instituted a new High School Fellowship program for an outstanding graduating high school student from BC. This fellowship is being run in conjunction with the Innovation and Science Council of BC (ISCBC). In 2004 about 100 of the top students from across BC were nominated by their schools for the award, from which the ISCBC selected a short list of seven students. TRIUMF selected Reka Moldovan from Kelowna as the inaugural winner of the \$3000 fellowship. She spent a six week summer research ex-

perience at TRIUMF working with Prof. Jess Brewer of UBC. This fellowship was considered to be very successful, so the plan is to make it an annual award with hopefully more student winners in the future.

Future Directions

TOP has committed to joining the Alberta Large-Area Time coincidence Array (ALTA) cosmic-ray detector in the schools project by funding research and development of the next generation data acquisition system. Two such systems are under development at the University of Alberta under the direction of Jim Pinfold, and TRIUMF can expect to see the completed units late in 2005. TOP is also gearing up for the United Nations World Year of Physics 2005, with many events being planned throughout the year. Plans are also under way to create a new Outreach Web site for use by teachers and students seeking information and updates about TOP programs.



Fig. 254. Kelowna high school student Reka Moldovan receiving her TRIUMF High School Fellowship award from TRIUMF Director Alan Shotter. Ms. Moldovan is presently a science student at UBC.