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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

DECEMBER 2004

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 2003, TRIUMF established the Researcher Emeritus position. It is intended to mark the past accomplishments of retired researchers and to express TRIUMF's appreciation for the willingness of those persons to continue to be active in research-related activities at TRIUMF.

Both short term and long term visitors are now being tracked. All long-term visitor information is collected, such as their 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 900 active security cards. The Canadian Nuclear Safety Commission conducted a security audit in September and they were quite satisfied with the security measures that TRIUMF has undertaken. All employees and long-term visitors are required to wear a photo ID card. All short-term visitors, those visitors of 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.

As a condition of TRIUMF's operating licence, the Canadian Nuclear Safety Commission (CNSC) required TRIUMF to submit a Preliminary Decommissioning Plan (PDP) to the CNSC that would provide an outline of the general process by which the facility could be decommissioned, the approximate schedule for the decommissioning, and an approximate cost for the decommissioning. This PDP was completed in 2003.

The insurance program was renewed with an approximate 25% 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 are covered by the Canadian Universities Reciprocal Insurance Exchange (CURIE).

There are currently five full members and seven associate member universities in the Joint Venture. Effective April 1, the University of Guelph became an associate member. Each full member university has two voting members on the Board of Management. Two additional voting members are appointed by the Board from the private sector. The associate members each retain one non-voting member on the Board.

TRIUMF has an Operating Committee (OPCOM) that is made up of representatives from the full member universities along with representatives from the TRIUMF users community and staff.

TRIUMF must now comply 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 ongoing and future planning. No Management and Accountability Framework was required to be submitted in 2003 due to the reports submitted by TRIUMF to the NRC in support of TRIUMF's 5 year funding request for the period 2005–2010.

In 2003, TRIUMF entered into a construction agreement with Polygon Construction Management Ltd. for the construction of a new housing facility. The new TRIUMF House will offer modern amenities in a soundproof environment that will ensure visitors to TRIUMF enjoy their home away from home. The project is expected to be completed in late 2004.

ENVIRONMENTAL HEALTH AND SAFETY

Licensing

A licence to commission the new MDS Nordion TR30-2 cyclotron was obtained in early February and an application for routine operation was submitted to the Canadian Nuclear Safety Commission (CNSC) by the end of that month. After a successful commissioning period an amendment to the TRIUMF Operating Licence was issued that includes the TR30-2 as one of the family of accelerators operated by TRIUMF.

A Preliminary Decommissioning Plan was submitted to the CNSC in early February in order to satisfy a new regulatory requirement. Extensive comments were received from the CNSC in late May and the plan was revised to take account of these comments. The report was then resubmitted in early December. At its November meeting, the TRIUMF Board of Management was charged with obtaining the requisite stakeholder approval and financial guarantees.

A revised set of Quality Assurance documents were also submitted for review to the CNSC in early February. Again detailed comments were returned to TRIUMF by the end of May. The QA documentation was revised accordingly and submitted for internal approval by the TRIUMF Division Heads. In the meantime planning continued for the implementation of the Quality Assurance Program. Phil Jones was appointed as QA manager and an internal assessment team was selected. A workshop on QA Assessment was organized to train the team. The team prepared an internal audit schedule for 2004 with the help of TRIUMF Division Heads. On November 13, an orientation session was held to introduce the program to all TRIUMF supervisory personnel.

The CNSC conducted several inspections of TRIUMF during 2003. The first, in February, focused on the Operator Training Program. The inspection found several positive aspects of the development of the training program. However, they requested that an action plan be submitted to indicate milestones and completion dates for various aspects of the program development. The action plan was put together by Phil Jones, in his capacity as TRIUMF Training Coordinator, and the various operation group training coordinators.

Another CNSC inspection focusing on security was conducted in September. The inspector found that TRIUMF security measures were appropriate to the level of risk.

A third inspection on the topic of emergency preparedness, emission monitoring and waste management was carried out in October. The inspection report included many positive findings but also raised a number of issues regarding documentation of procedures and the requirements for drills and exercises. Several minor technical issues regarding the enironmental sampling and effluent monitoring were also identified. TRIUMF must respond to these findings by February, 2004.

Personnel Dosimetry

The collective dose for TRIUMF personnel for the year 2003 was 475.7 mSv as measured by the direct reading dosimeter service. Table XLVIII shows the breakdown of the collective dose by various work groups. The collective dose was somewhat higher than for 2002, largely due to some major tasks such as the replacement of the quadrupole triplet downstream of T2 in the high intensity meson beam line. ISAC continues to make a relatively minor direct contribution to the collective dose.

Table XLVIII. Collective dose for TRIUMF personnel by group.

Group	Dose (mSv)	Fraction of total (%)	Median (mSv)
Applied Technology	150.9	31.7	3.8
Remote Handling	50.7	10.7	4.5
500 MeV Operations	40.8	8.6	2.3
Safety Group	30.1	6.3	1.6
RF Group	25.9	5.4	2.7
Vacuum Group	25.3	5.3	3.5
Plant Group	25.2	5.3	0.6
Beam Lines/Probes	19.2	4.0	0.9
Tech Support	17.6	3.7	2.2
Life Sciences	15.8	3.3	0.5
ISAC Operations	10.9	2.3	0.4
Science Division	8.0	1.7	0.06
Outside Contractors	3.4	0.7	0.02
Others	41.9	8.8	—
Total	475.7	100.0	0.6

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 2004. The TRIUMF Accident Prevention Committee and the TRIUMF Housekeeping Committee instituted a new system of documenting both safety deficiencies and housekeeping deficiencies on a single form using Novell networking software. This will help manage day-to-day activities more efficiently, allowing organizing the information to best match TRIUMF's operation. A new Injury Reporting System for the First Aid Program is also nearing completion. The new system will help maintain more accurate statistics.

Worker pride at TRIUMF continues to improve in the workplace thanks to all those who help contribute to our Occupational Health and Safety Programs.

Training

The Radiation Safety Course was offered a total of five times in 2003 (January, May, July, September and November) with 52 trainees attending. 96% of the trainees successfully completed the course with an average of 90% on the final exam.

In February the CNSC evaluated the progress of the development of formal operator training programs at TRIUMF. The training was rated as B – Meets Requirements by the evaluators. The inspectors did raise a few action items regarding the training program, and the program managers, along with the assistance of the training coordinator, submitted an action plan outlining the tasks necessary to complete the development and implementation of the training.

Interlocks and Monitoring

The TR30-2 Access Control System and Radiation Monitoring System were both commissioned early in the year. The Access Control System's functionalities were specified by the Safety Systems Group but the detailed design and construction were completed by outside contractors. The Radiation Monitoring System was purchased from a commercial supplier, then modified to meet the specific requirements of the TR30-2.

A final five safety-critical neutron/gamma detector pairs were installed outside the shielding of the proton hall and a series of Operators' procedures in response to safety-critical detector trips were drafted. A report will be written for each individual trip event. Each report will include an estimate of the maximum radiation field outside shielding (at licensed beam current) had the beam not been tripped off and a record of whether or not that radiation field exceeded 50 mSv/h.

Eight safety-critical detector trips occurred during the year and a report was written for each.

The Safety Systems Group convened Design Reviews of several proposals to develop new systems and expand existing ones. Proposals for review included the interlocking of the ISAC B1 electrical room to the 500 MeV Central Safety System and the interlocking of the ISAC DRAGON experimental area to the Ion Beam Safety System. Both projects are to be completed during the 2004 shutdown.

ADMINISTRATION COMPUTING AND COMMUNICATIONS

Management Information Systems

The MIS systems saw only incremental changes in 2003. The central server, an IBM eServer iSeries, which provides database, directory, application program, Web, and PC file-and-print services for TRIUMF Administration, had both hardware and software updates during the year; aside from increased performance, these updates were largely transparent to users.

Additional databases were implemented to support data-driven Web functions for site announcements, seminar scheduling and notification, and meeting room reservations; this last was integrated via XML with RoomWizard display panels for the ISAC-II meeting rooms.

More information from existing databases was made available to users via the Web, including the abilities to view the status of any project account, to view one's own travel order status, and to view one's own (and one's subordinates) vacation entitlements.

No major changes were made to the Administration client system configurations (Windows 2000 based PCs).

Public Web Services

A new Web server, www.triumf.info, was installed and made available in 2003. The initial purpose of this server is to provide a better public information Web site, with content addressed more to the outside world than to TRIUMF employees and users; over time, it is intended that this site will become the default site for outsiders to access TRIUMF information.

The new site, which is Linux/Apache based, is largely database-driven, and uses information both in its local mySQL database and in the Administration DB2 database that resides on the Administration iseries server. One feature of this database support is the capability to show randomly selected current headline articles whenever the home page is loaded.

The new Web server is being used to provide additional site support functions, starting with those for the Science Division. In 2003, new interactive Web based tools were implemented to publish beam schedule information, and Web based forms for requesting beam time were under development.

New standardized Web utilities were developed to support conferences that are hosted and managed by TRIUMF. These utilities, which run on the admin.triumf.ca Web server, support conference registration, payment, and email notification functions. Conference Web sites now only need to provide links to these utilities, and no longer require these functions to be re-implemented on their own sites. The first conference to make use of these utilities is the NIC-VIII conference, which will take place in July, 2004.

Telephones

Major changes were made to the site telephone system in 2003. The central switch required expansion to accommodate the new telephone locals in the ISAC-II building; the added capacity allowed for over 200 new locals to be added. The Meridian Mail voicemail system, which was largely unchanged since its original installation in 1995, was completely replaced with new technology, CallPilot. This new version is much more easily managed, and has more capabilities than the old. The conversion was done with negligible impact on users.

TRIUMF OUTREACH PROGRAM

The TRIUMF Outreach Program (TOP) was officially launched in April with generous grants from the Vancouver Foundation and the TRIUMF Technology Transfer Office. These grants will support TOP's goals of bringing the excitement of subatomic physics research in Canada to as broad a public audience as possible. In 2003, effort was focused on establishing programs for high school teachers and establishing a new High School Fellowship.

High School Teacher Programs

A key component of TOP is to bring high school science teachers to TRIUMF for brief "internships". Teachers join and participate fully on a running experiment for 3–5 days and, afterwards, the teachers work with TOP to produce resource materials for their classrooms and the general public based on their internship experience. TOP pays travel and housing costs as if the teachers were "visiting scientists". Three teachers from Victoria, Terrace (see Fig. 318) and Pitt Meadows took part in the program in 2003, with over a dozen more signed up for opportunities in 2004 and beyond. Initial feedback from the program has been very positive, with one teacher writing about his experience in the Journal for High School Science.

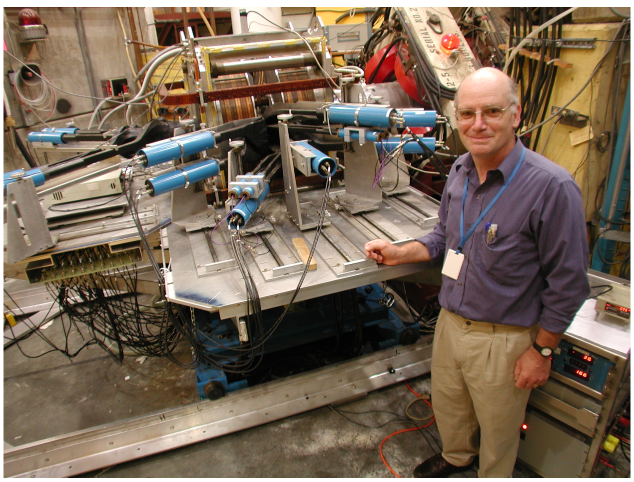

Fig. 318. A visiting high school science teacher from Terrace.

TRIUMF, together with the BC Association of Physics Teachers, hosted a Professional Development Day for high school science teachers in October, 2002 which was deemed an unqualified success. Scheduling conflicts precluded a repeat event in 2003, but it is planned to make the day an annual program starting in October, 2004.

TRIUMF/ISCBC High School Fellowship

In conjunction with the Innovation and Science Council of BC (ISCBC), TRIUMF has instituted a new High School Fellowship program for an outstanding graduating high school student from BC. Top students from across BC will be nominated by their schools, from which the ISCBC will select a short list. TRIUMF will select one winner for the $3000 fellowship, after which the fellow will spend a six-week summer research experience at TRIUMF. This year's fellowship is considered a pilot project and, if successful, it is hoped to make it an annual program with perhaps more student winners.

Future Directions

In 2004 TOP plans to join the ALTA (Alberta Large-Area Time coincidence Array) cosmic-ray detector in the schools project. This project aims to put scintillator-based cosmic-ray shower detectors on school roofs to be operated by teachers and their students. The detectors are easy to set up and use, and will be interconnected via the Internet with other schools in the project. This project will bring many of the techniques and challenges of running a large-scale physics experiment right into the classroom, providing students with a first-class science education experience. TRIUMF has funding to build several modules, and is working with the University of Alberta in efforts to make each module more affordable.