TRIUMF

ANNUAL REPORT
SCIENTIFIC ACTIVITIES
2002

ISSN 1492-417X

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 2003

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.

TECHNOLOGY TRANSFER DIVISION

INTRODUCTION

The Technology Transfer Division at TRIUMF is responsible for the commercial interactions for the laboratory. It is composed of a small group dedicated to optimizing the commercialization technologies emanating from TRIUMF research, plus the Applied Technology group that is responsible for the operations of the on-site commercial cyclotrons on behalf of MDS Nordion.

TECHNOLOGY TRANSFER

The mandate of the Division is the pursuit of all financially and technically viable opportunities for commercializing technologies emanating from the research at TRIUMF. This mandate must recognize the preeminence of the scientific research at the laboratory, and proceed in a manner that optimizes the impact on TRIUMF and the Canadian economy while minimizing the impact on scientific activities at the facility.

The current Contribution Agreement between the National Research Council (NRC) and TRIUMF includes the requirement for TRIUMF to enhance its impact on the Canadian economy. This impact is measured through the benefits provided to Canadian industry, both through the transfer of TRIUMF's technical knowledge and through its purchasing practices.

APPLIED TECHNOLOGY GROUP

500 MeV Isotope Production Facility

During this year, the 500 MeV irradiation facility received 199 mAh. Eight targets were irradiated, six targets delivered to produce ^{82}Sr/^{82}Rb for MDS Nordion.

CP42 Facility

The total beam delivery for 2002 was 982 mAh. The weekly beam delivery graph is shown in Fig. 253 and the quarterly time evolution of the beam delivery is shown in Fig. 254. The downtime and maintenance statistics are analyzed in Fig. 255 and compared with the TR30.

Work is still proceeding on the CP42 control system upgrade.

TR30 Facility

The total beam delivery for 2002 was 3267.5 mAh. The weekly beam delivery graph is shown in Fig. 256 and the quarterly time evolution of the beam delivery is displayed in Fig. 254. The downtime and maintenance statistics are analyzed in Fig. 255 and compared with the CP42.

A new type of a radiation hard target station has been installed on the south beam line (2B) and tested successfully at proton beam currents in excess of 0.5 mA (30 MeV). ATG is planning on replacing the north high current target station for palladium production (1B) within the next year.

ATG Development Projects

ATG continues to be actively involved in the commissioning of the new TR30 cyclotron facility. Two improved high current target stations have been built and installed.

ATG started the production of carbon foils to be used in the extractors of the CP42 and TR30 cyclotrons. Films of up to 150 μg/cm^2 have been manufactured and tested successfully.

RADIOISOTOPE PROCESSING (MDS NORDION)

During the year 2002, MDS Nordion shipped large quantities of short-lived medical radioisotopes produced using the TR30 and CP42 cyclotrons. The main radioisotopes produced and shipped were iodine-123 used for thyroid imaging and research, palladium-103 used in prostate brachytherapy, and indium-111 used for monoclonal antibody imaging.

The facility expansion commenced during the year. By year end, the building was completed and commissioned. The cyclotron and beam lines were installed and are being commissioned. The plan is to have the facility and cyclotron operational in early 2003.

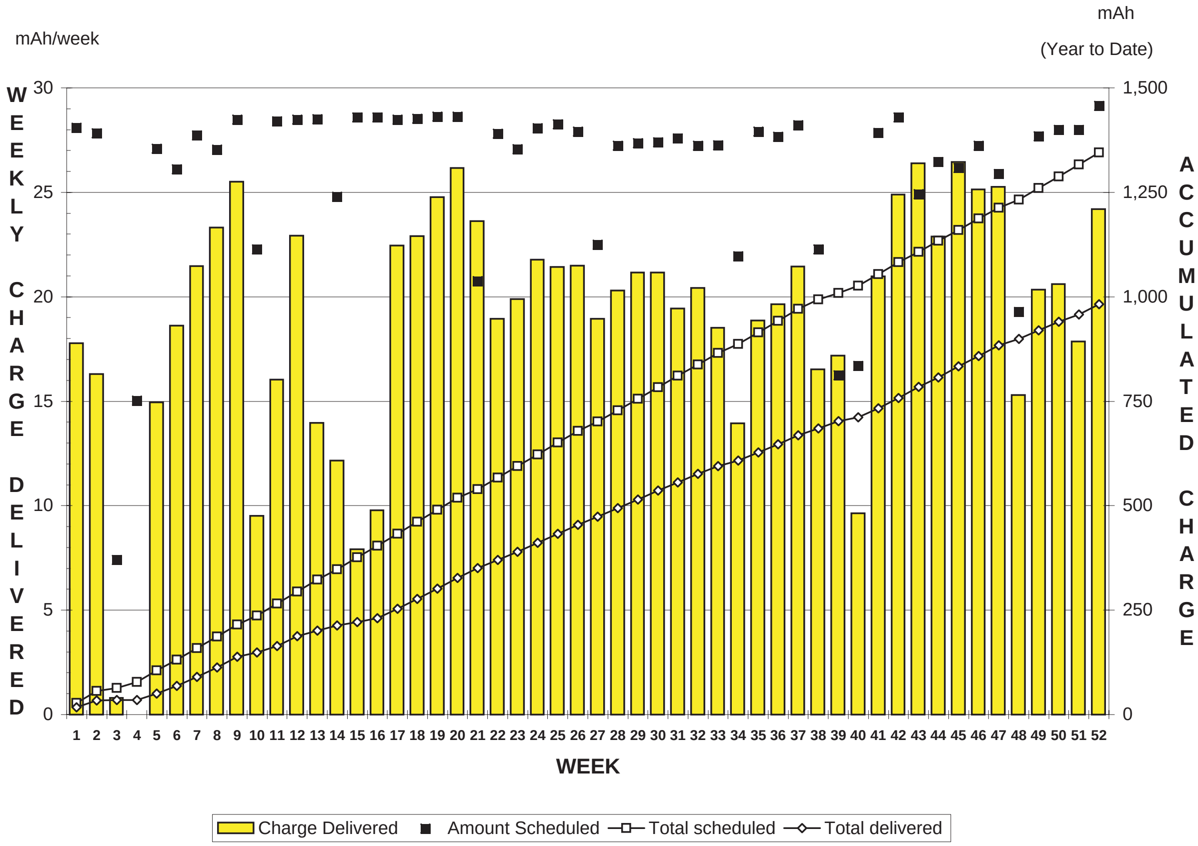

Fig. 253. Weekly beam delivery for the CP42.

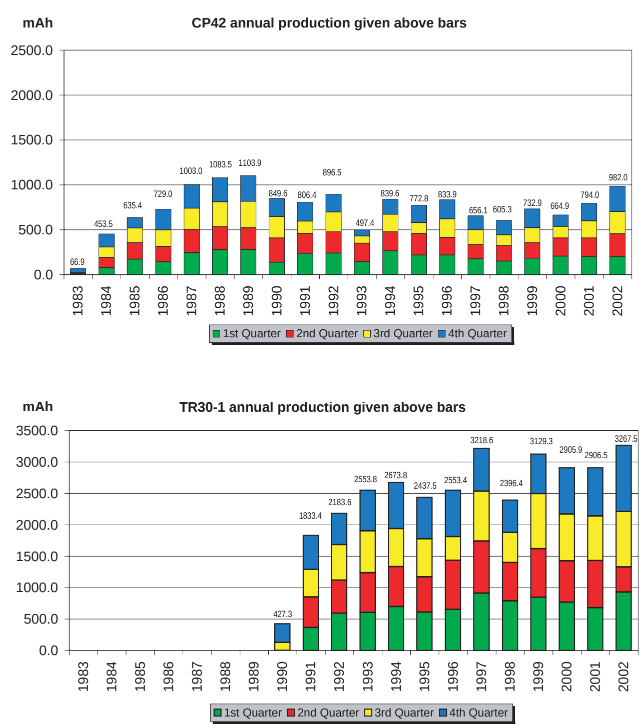

Fig. 254. Annual time evolution of the beam delivery for the CP42 (top) and the TR30 (bottom).

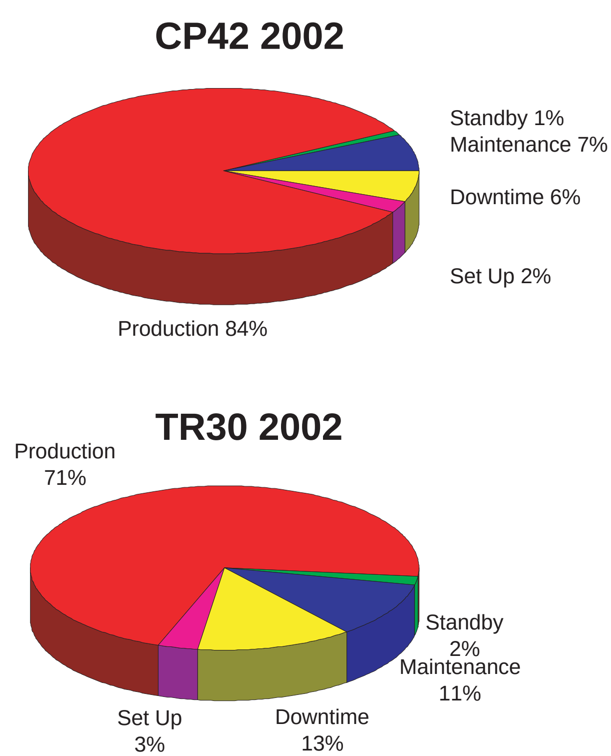

Fig. 255. Breakdown of downtime and maintenance for the CP42 (top) and the TR30 (bottom) during operational hours.

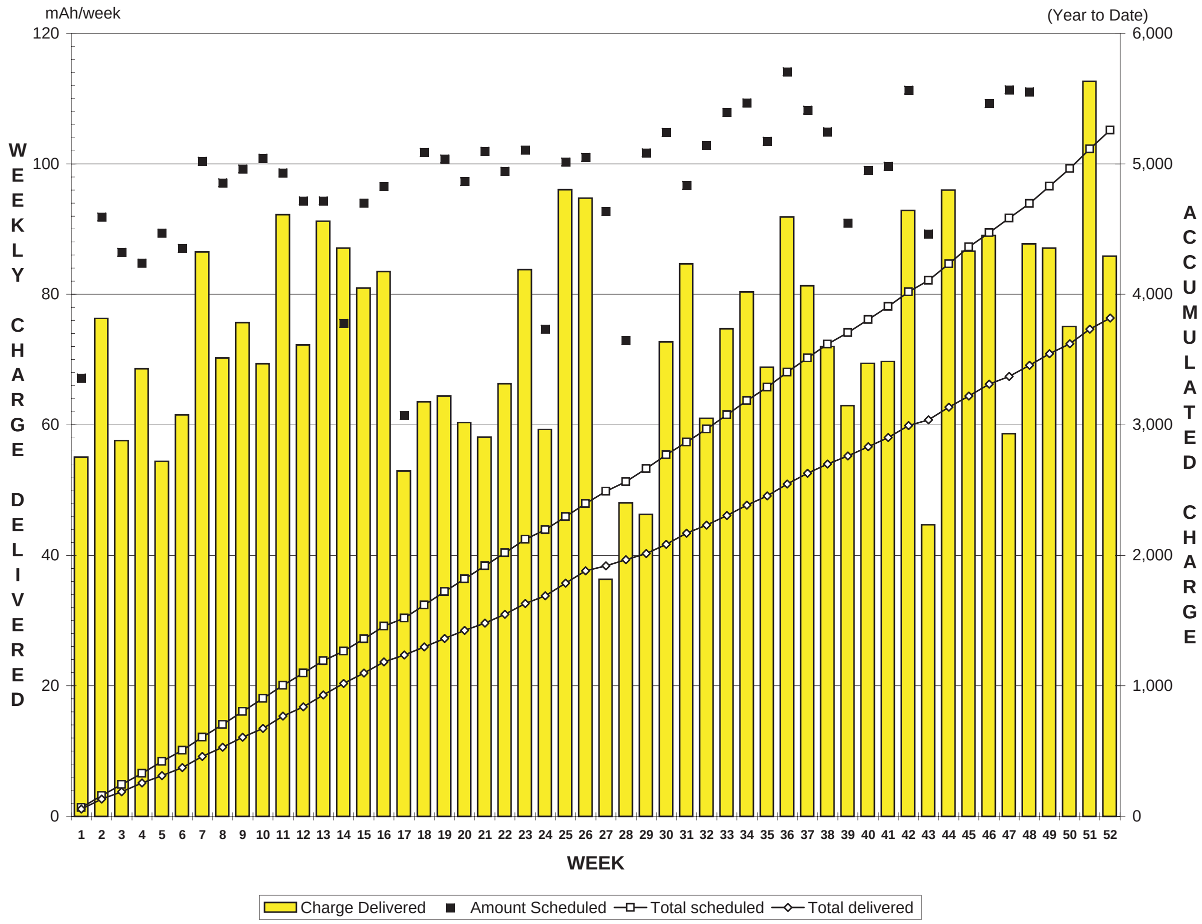

Fig. 256. Weekly beam delivery for the TR30.