TRIUMF ATG

Tri-University Meson Facility
Vancouver, Canada

How the Applied Technology Group Does Business

P. Bloemhard, Operations Supervisor

Operations Data

Laboratory Mission:
Radioactive Isotope Production

Type of accelerator(s):
Two Compact High Intensity Cyclotrons (CP-42 / TR-30)

Maximum Energy (MeV):
42 / 30

Maximum Current (uA):
250 / 1200

Commissioning date:
October 1983 / July 1990

Number of staff in operations group:
19

Type of maintenance program:
Preventative / Opportunistic

Typical maintenance downtime:
15 % / 10 % (averaged yearly)

Percentage of staff involved with maintenance:
100%

Percentage of budget spent on maintenance:
10%

Number of operators per shift:
1 (plus daytime "assistant" on weekdays)

Percentage of time Operators operate:
80%

Average years of Experience of Operators:
8

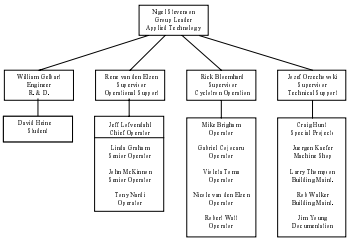
Average dose to Operator per Year:
4.0 mSieverts

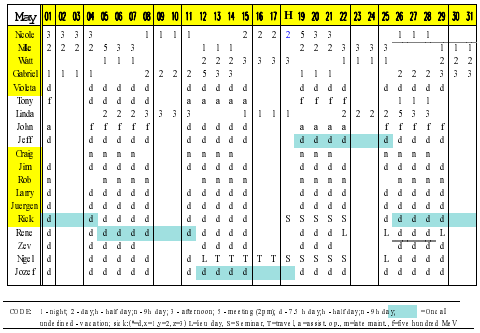
Operator Levels:
1 - 5

Control Room Area (m²):
27

Number of display screens in Control Room:
17

Is remote operation possible:
No





CODE: 1 - night, 2 - day/h - half day/h - 9h day, 3 - afternoon, 5 - meeting (2pm), d - 7.5 h day/h - half day/h - 9 h day, =One all undefined - vacation, sick(*=d,x=1 y=2, z=3) L=leu day, S=Seminar, T=move (a=assist, o.p., m=late maint., 6=five hundred MeV

ATG Organization

Over the years our group has evolved into this structure. Currently we have 19 staff.

Of the 11 people that can operate, 7 have an electronics background, the rest are mechanical technologists. One supervisor is a mechanical engineer. The group head is a physicist. We have a machinist, two mechanical draftsmen (Autocad) and an inventory specialist.

Since the start of operations in 1975, we have had 7 staff leave (and 3 retirements). This low turnover rate may be due to an emphasis on safety (such as the relatively low 4 mSv / year dose limit) and employee involvement in decision making. The small group size allows us to maintain motivation and focus. Everyone knows that our job is to safely produce as much as possible and keep the machines running reliably.

Shift Schedule Features

Three shifts with changes at 23:00, 07:00 and 15:00 (15 minute overlaps)

A five week rotating cycle.
Total of 21 days on (includes three weekends and two 7 day afternoon stretches)
and 14 days off (includes two 4-day weekends.

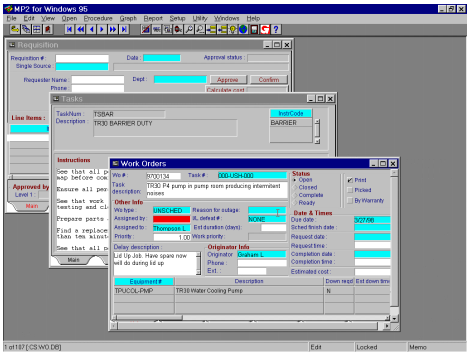
Five operators with 7 days, 7 afternoons and 7 midnight shifts per rotation.

Three "assistant / standby" operators and the Chief Operator provide sick and vacation relief.

Sick Operator Options:
- ask the other two on shift to fill in on overtime.
- call in a standby operator.
- call in a supervisor.

shifts per rotation.

Three "assistant / standby" operators and the Chief Operator provide sick and vacation relief.

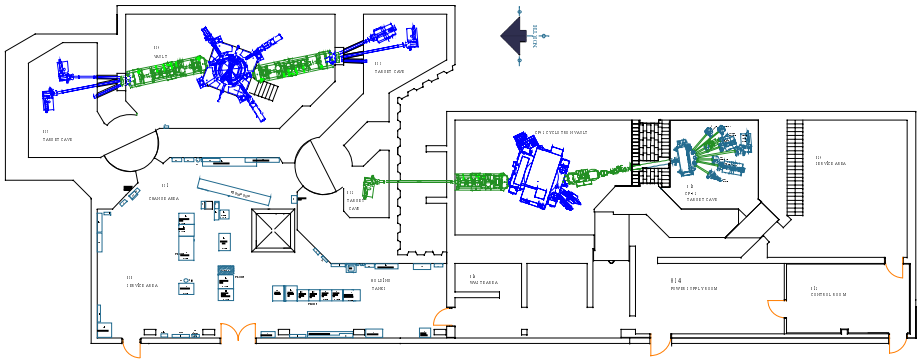


Datastream MP2 - Computerized Maintenance Management System

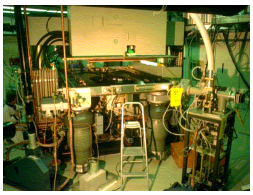
When we decided to replace our paper and pencil system we initially tried to homebrew a system based on standard MS Windows database and spreadsheet programs. Although we used this system for about two years we eventually abandoned the approach and decided to research the commercial packages. Based on an extensive review of the literature and some product demonstrations we decided on MP2.

Good points of MP2 (and similar) programs:
- program forces database upkeep
- provides traceability (FDA requirements)
- powerful and flexible
- provides accountability as our operations group grows
- easy for technicians or new job data

Bad points of MP2:
- we often perform "opportunistic maintenance." MP2 is geared towards more rigid maintenance scheduling.
- requires extensive training for "Maintenance Coordinators"



TR-30 Vault



CP-42 Tank

Control Room - North Side

Control Room - South Side