

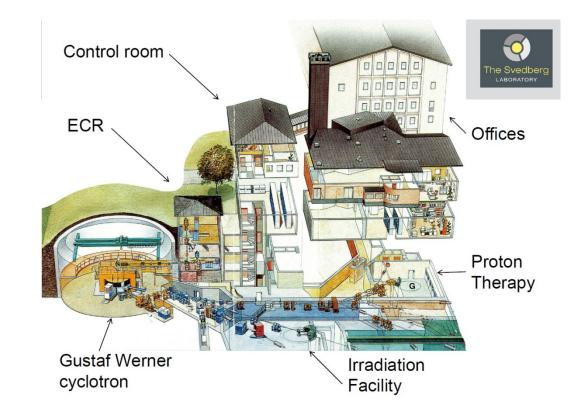
How TSL has scaled down and streamlined

The Svedberg
LABORATORY

Author/presenter: Mikael Pettersson
Coauthors: Konrad Gajewski, Björn Gålnander, Daniel van Rooyen
The Svedberg Laboratory, Uppsala University, Sweden



Some years and events: 1949: Commissioning of cyclotron, synchrocyclotron 185 MeV. Gustaf Werner's Institute of Nuclear Chemistry. 1951: First beam. 1957: Worlds first proton treatment of cancer in a patient. 1977-1986: Cyclotron rebuilt, Sector focussing, 20-180 MeV. 1986: Formation of the The Svedberg Laboratory (TSL), GW Cyclotron, CELSIUS-ring and Tandem Lab. 2005 Decomissioning of CELSIUS ring, Reorientation towards Proton Therapy and Irradiation physics (Blue Hall) in beam sharing, staff reduced from 55 to 15 persons. 2012: Still kicking and alive, serving both local users from the Uppsala University hospital as well as worldwide customers from industry and the research community within the EC.



Running the accelerator in former days Crew Startup <u>Users</u> Control room Physics research Tuning/optimizing/quality checks funded by the swedish Full time operators research council 6 persons **Setup Alarms Proton therapy Experts for fine tune and** quality checks, 6 persons **Development and research** Controlling Beam on/off Controlling clearing of localities Experts, researchers, **Testing of electronics** technicians, admins by customers worldwide 43 persons Shutdown

Changes done in organization, run cases and routines

Reducing staff
(retirement,
reorganization
within university,
dismissal)

Flexible staff, change of duties and working hours

Standard run cases.

Longer periods of protons 180 MeV for longer patient treatment periods

Less often protons with lower energies or heavy ions

Service and preventive maintenance

Spare parts inventory and new strategies

Saving energy by sleep mode during nights

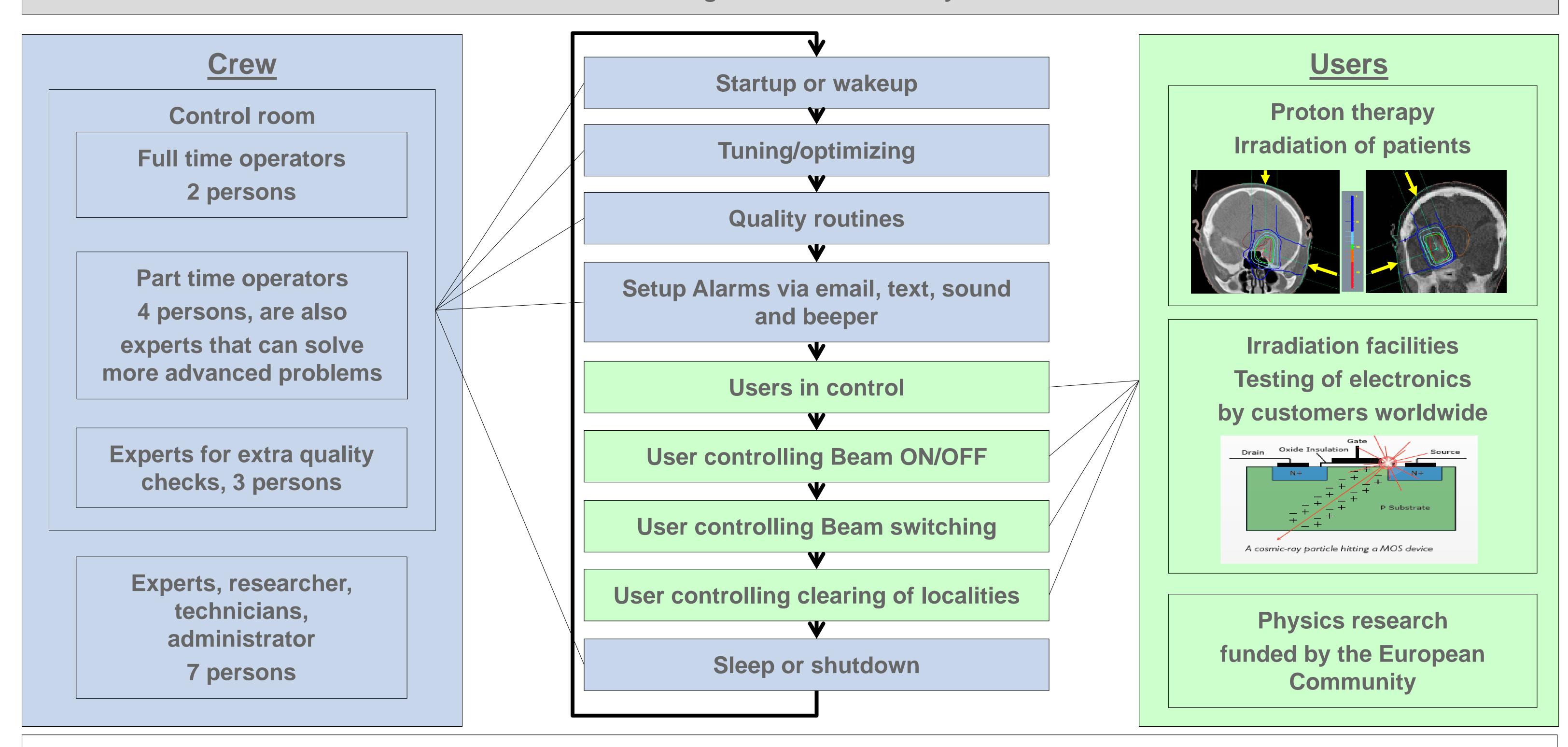
New applications for simplification and efficiency

Beam switching, for different beam current and to different localities within minutes

More documentation
to avoid being
dependent of
individuals and to
service and repair
more effectively

More quality routines

Running the accelerator today



Normal day: 00-06: Sleep mode, 06-08: Startup, 08-18: Therapy/Irradiation facilities, 18-22: Irradiation facilities, 22-24: Sleep mode

Normal year: w1-3: service, w4: CW, w5-24: FM, w25:CW, w26-33:service/vacation, w34:CW, w35-50:FM, w51:CW, w52:service/vacation