

# **Reliability of the accelerator facilities at iThemba LABS**

J.L. Conradie, C. Bakkes, A. Crombie, W. Duckitt, D.T. Fourie, H. Du Plessis, C. Lussi, I.H. Kohler, H. Mostert, R. McAlister, M. Sakeldien, N.P. Stodart, R.W. Thomaes, M.J. Van Niekerk, P.A. Van Schalkwyk, L. Swartz

iThemba LABS, P.O. Box 722, Somerset West 7129, South Africa

iThemba LABS is a multi-disciplinary research facility that provides accelerator-based facilities for physical, biomedical and material sciences, treatment of cancer patients with neutrons and protons and the production of radioisotopes and radiopharmaceuticals. Proton beams are accelerated with a K=8 injector cyclotron for injection into a K=200 separated-sector cyclotron. Production of radioisotopes and neutron therapy is done with a 66 MeV proton beam. For proton therapy a 200 MeV beam is used. For radioisotope production the beam current ranges from 80 to 300  $\mu\text{A}$ , depending on the target material. Low intensity beams of light and heavy ions as well as polarized protons, pre-accelerated with a second injector cyclotron with a K-value of 11, are available for nuclear physics research.

Reliability of the accelerators is of utmost importance since patients have to be treated according to a fixed schedule. Radioisotope products also have to be delivered on time at hospitals all over the country. Unscheduled interruptions exceeding more than 10% of scheduled time are not acceptable to the medical community and may lead to termination of the medical program. The causes and frequency of interruptions are regularly analysed. The plans that were made and the actions taken to minimize the interruptions will be discussed. The influence of a 4 MW uninterruptable power supply on the availability of beam will be discussed in more detail.