



Copenhagen University Hospital

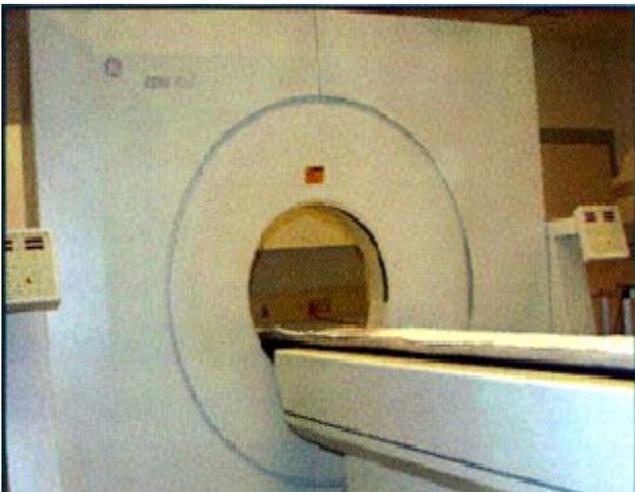
Hospital

Denmark

Copenhagen University Hospital (Rigshospitalet)

The continued development of computer technology and the medical profession's desire for safer, more detailed ways of imaging the human body have led to new methods of medical imaging. One of these is positron emission tomography (PET) which is a form of radio nuclide scanning. The technique uses computers to produce images showing the functioning of tissues as well as their structure.

At the Copenhagen University Hospital (Rigshospitalet) in Copenhagen, Denmark, the PET and Cyclotron Units are conducting research into the production of radioactive isotopes used as tracers. PET scans are undertaken especially in the fields of oncology, cardiology and neurology.



The PET scanner at the Copenhagen University Hospital

Isotope Production Control With IGSS

The isotopes required for PET scanning are produced in a cyclotron owned and operated by the Copenhagen University Hospital. It's installed in a high security compound and shielded by a thick concrete wall. And it's 7-Technologies software, IGSS, which is the SCADA system controlling and monitoring the critical isotope production process in the cyclotron.

Traces in the Human Body

During a PET scan, a radiation source is temporarily introduced into the body to provide a trace. A radioactively tagged chemical produced with isotopes from the cyclotron is the radiation source which can be injected, swallowed, or inhaled by the patient. Inside the body, the chemical takes part in a

biochemical process, concentrating itself in tissues that are more metabolically active. Detectors measure the radiation emitted from the radioactive particles and a cross-section view of the part of the body being examined is built up. The procedure is safe as the amount of radiation involved is tiny.

CUSTOMER CASE

Radioactive Pharmaceuticals

The short-lived radioactive isotopes for the PET scanner must be produced in the cyclotron just before introduction into the body, otherwise they lose their trace properties. Both production and use of radioactive pharmaceuticals is governed by stringent regulations laid down in manufacturing practice legislation. Because they comply to the letter with these regulations, the PET and Cyclotron Units have been licensed as a "pharmaceutical producer" with the right to manufacture radioactive pharmaceuticals for use in the human body.

Production of Isotopes for Other Purposes

The Copenhagen University Hospital's cyclotron also produces radioactive isotopes for non-medical research purposes and for other areas where radioactive analysis methods are used; for instance in the test of electrical components that are used in Danish and European space research projects.

Why the Hospital Chose IGSS

The Hospital made a decision to modernize the cyclotron's SCADA system and several SCADA solutions were considered. But at the conclusion of a series of thorough investigations, IGSS was alone in the field by living up to the rigorous safety and production standards set by the Hospital.

One of the difficult requirements to meet was that changes and intervention initiated by the operator had to be executed and displayed on the monitor in less than 5 milliseconds. This demand can only be met by using so-called event-orientated communication. And this is one of the strong features of IGSS. In event oriented communication it is the PLC that attaches the time stamp to the online data and sends this information on to the SCADA system. IGSS could react to this new data in a rapid and effective manner with no need for the more time consuming polling of the PLC to fetch an update.



The cyclotron at the Copenhagen University Hospital

System Integrator

Høier & Vendelo A/S