

sci-tech.

BRIT MAN BECOMES WORLD'S FIRST TO UNDERGO HEART OP USING RADIATION

A 67-year-old British man has undergone a successful heart surgery using the revolutionary Cyberknife technology for the first time ever. Michael Kilby, from Moreton in Gloucestershire, had a tumour, larger than a golf ball, inside the right chamber of his heart. The highly focused radiation, like a 'scalpel', was used to cut away the tumour inside his beating heart. The radiation beams were controlled by a robot.

—ANI

IISc's cold test works wonders

A joint IISc and ISRO team develops facility to study the effects of cryo-treatment on materials developed by ISRO for space applications

SHARATH AHUJA

Each satellite is made up of several thousand components and each of these has to pass stringent tests before being allowed to be used for space applications. Three scientists from the Centre for Cryogenic Technology, IISc, in a joint collaborative research programme with Dr M V N Prasad, Dr D Subramanian and Geetha Sen from the Liquid Propulsion System Centre (LPSC), ISRO, Bangalore, have developed a facility for studying the effects of cryo-treatment on the dimensional stability of diaphragms of pressure sensors developed by ISRO for space applications.

The three scientists are: Dr D S Nadig, Prof Subhas Jacob and Dr R Karunanithi.

Several hundred diaphragms developed by ISRO's LPSC unit, were cryo-treated at the IISc. The experimental cycle consisted of subjecting the samples to extremely low temperatures (up to 98 degrees Kelvin) for prolonged periods.

The scientists then studied sever-



FILE PHOTO
The cryotreatment experimental facility at IISc, Bangalore

al mechanical properties of the material—tensile strength, hardness, residual stress and material crystal structure, before and after cryo-treating the samples.

The teams, which have reported significant benefits to diaphragms of pressure sensors through cryo-treatment, have presented their findings at the reputed Space Cryogenics Conference at NASA, USA.

The emerging technology of cryogenic processing is gaining respect the world over as a technique for increasing the durability and dimensional stability of materials. Re-

search has helped significantly improve wearresistance of materials through cryogenic treatment. It augurs well for the space industry as materials can be tailored to its specifications.

TECH TO SATELLITES' AID

Whenever any material is subjected to manufacturing operations like melting, forming, machining, cutting, grinding and so on, it undergoes stress. The stress manifests itself in the nature of defects in the crystal structure of materials. The most commonly observed defects are in the form of vacancies, dislocations, stacking faults, etc. As the level of stress increases, the density of defects increases, cracks develop in materials and failure takes place.

For space scientists this could spell disaster. Hence the need for developing technologies that help improve stability and performance of materials and components that can be integrated into satellites.

(The author is technical officer, department of instrumentation at the Indian Institute of Science)