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Thomson Nielsen is pleased to announce the successful launch of the Space Radiation Monitor System on board the Bigelow Genesis I satellite on 12 July 2006.

The Space Radiation Monitor System has been designed and developed by Thomson Nielsen to meet the requirements of the space community for the measurement of radiation at high altitudes and in space. Thomson Nielsen gratefully acknowledges the support of the Canadian Space Agency and National Research Centre, Ottawa in this work.

The Space Radiation Monitor System is a family of 3 sensors able to measure radiation in space. Such measurements are vital to understanding the levels of radiation, and provide an indication of the possible harmful effects to humans and electronics. Included in the Space Radiation Monitor System are the Dose Depth Monitor, the Proton Monitor and the CPLD proton Monitor.

The level of radiation experienced by the electronics varies according to the shielding provided by the spacecraft and the payload enclosures. An instrument which gives data on the total dose as a function of shielding thickness is more valuable than a single dose measurement. This instrument is known as a Dose-Depth monitor. The Dose-Depth monitor has been designed to measure this curve at four shield thickness typical of different positions in the payload. The monitor consists of four dual MOSFETs, each with a different thickness of shield material.

Proton Monitors have been designed and built to interface with the satellite on-board computer. The instruments have been characterized over the proton energy range 10 MeV to 500 MeV. Small, low power instruments have been developed to monitor single event upsets SEUs in space-borne electronics. They will act as monitors for spacecraft in orbits where single event upsets SEUs and other single event effects SEEs are considered a significant hazard to on-board electronics.

Due to commercial pressures, there is considerable interest in the space radiation effects community in flying commercial off the shelf components (COTS) in spacecraft. There are also a number of commercial satellites planned to fly in high inclination low earth orbits (LEO) which may experience radiation hazards due to total dose and/or protons. For both these reasons there is a need for small stand-alone monitors which can be used in satellite “housekeeping”. Not only will these monitors be useful in helping to determine if a spacecraft’s electronic system has experienced radiation-induced problems, but it will also be useful in determining how well systems perform in the actual environment.

About Thomson Nielsen

Thomson Nielsen, located in Ottawa, Canada, is an internationally recognized leader in the development and manufacture of radiation measurement devices. The company was incorporated in 1984 and since then has worked almost exclusively in radiation detection technologies. Its main applications include medical dosimetry and radiation monitoring in space. For additional information, please contact Wendy Chan at (613) 596-4563 ext 101.