To excel in radiation science so as to:

- enforce and promote the radiation safety of workers, the public and the environment;
- ensure that irradiating apparatus and nuclear materials meet the statutory requirements of quality, safety and efficacy.

**Core Functions**
- Regulation of use of ionising and non-ionising radiation equipment
- Personal radiation monitoring for all radiation workers
- Testing of imported food for radioactive contaminants
- Testing of sealed radiation sources for leakages and calibration of radiation measuring instruments
- Technical support for the emergency and preparedness planning for dealing with radiological accidents on site or at a national level.
The Centre for Radiation Protection (CRP), which incorporated the Radiation Science Division of the former Institute of Science and Forensic Medicine, is the national controlling authority for the safe use of ionising and non-ionising radiation in Singapore.

It administers and enforces the Radiation Protection Act and its subsidiary regulations through a system of licensing and inspection. Services provided through CRP’s 7 laboratories include personal monitoring for all radiation workers, testing of imported food for radioactive contaminants, testing of sealed radiation sources for leakages and calibration of radiation measuring instruments. Its import/export licences and endorsements are auto-processed through the TradeNet System.

**Ionising Radiation Control**

In FY 01, a total of 13,422 licenses was issued for the purposes of import, export, sale, possession and use of ionising radiation (IR) irradiating apparatus and radioactive materials and the transport of radioactive materials. 1,232 endorsements were given for the import/export of components of irradiating apparatus without the radiation emitting components. 78 endorsements were made for ships carrying nuclear consignments such as nuclear fuel rods, uranium hexafluoride with natural uranium or enriched uranium to transit in Singapore.

Routine inspections for radiation leakages and safety of operation were also conducted at premises using IR irradiating apparatus or radioactive materials. A total of 397 inspections was made at medical, dental and veterinary practice premises and industrial and educational institutions. Checks were performed to assess that the facilities and equipment were in proper condition and that radiation levels at places accessible to public were within limits specified in the Regulations.

**Non-Ionising Radiation Control**

7,427 licenses were issued for the import, export, sale, possession and use of non-ionising radiation (NIR) apparatus in FY 01. The types of NIR apparatus range from magnetic resonance imaging, ultrasound and lasers for industrial, medical and entertainment purposes, microwave oven and UV sun tanning lamps.
66 inspections of premises using NIR apparatus were conducted to ensure that the regulations were compiled with. In addition, 21 surveys at base-stations and radio/television transmitting stations were conducted.

Checks were also performed on 47 new models of microwave ovens to ensure that radiation levels emitting from microwave ovens sold in Singapore were below that specified in the Regulations. Further, all import consignments of laser pointers were checked for the manufacturer class and proper labelling.

**Services and Consultancy**

In 2001, there were 470 wipe tests conducted at establishments that used sealed radioactive sources in industrial, medical and research applications. Wipe samples were brought back to CRP’s laboratory and tested for presence of radioactivity using Nal and GM detectors.

CRP provided the necessary personal monitoring service to all workers performing ionising radiation work in Singapore. Over 5,000 thermoluminescence dosimeters, or TLDs, were processed monthly. Dose reports were generated and issued to the companies on the level of radiation dosage received by their workers. CRP investigated 46 overdose cases which occurred mainly in the industrial radiography.

98 consultancy services on all aspects of ionising and non-ionising radiation protection were provided to industries, ministries, statutory boards, hospitals and the general public. The services covered a wide spectrum from radioactive waste management system, radiation accident procedures, building design of radiation facilities to measurement of radiation levels in premises and around equipment. One highlight was the successful design of the remote radiation monitoring network for MINDEF.
Nuclear Safety and Emergency Planning
During the visits of Nuclear Powered Warships (NPWs), CRP conducted environmental gamma ray monitoring and provided contingency support in the event of a radiological accident. In addition to the monitoring station installed at Sembawang Wharves, another monitoring system was being installed at the new Changi Navel Base. In 2001, 11 NPWs visited Singapore.

Environmental Radiation & Radioactive Waste Management
CRP was constantly engaged in the measurement of radioactivity in environmental samples such as air filters, water and soil, and industrial samples such as ilmenite sands, copper and tin slags, garnet grains, steel rebars, marble, etc. NaI detectors were also used to conduct radioactivity analysis on food samples. A total of 1,355 food samples was tested and certified free from radioactive contaminants.

Lectures and training were also provided for medical doctors, dentists, undergraduates and radiation workers in hospitals, universities and commercial companies. In 2001, 225 tests were conducted to ascertain the workers' competency prior to the issue of licence.

Ionising Radiation Dosimetry
In CRP, its Secondary Standards Dosimetry Laboratory (SSDL) was established with the support of the International Atomic Energy Agency (IAEA) and the World Health Organisation (WHO) as part of the international network of secondary reference laboratories. SSDL acts as a national reference centre for radiation protection and environmental dosimetry. Inter-comparisons to ensure accuracy of measurement of radiation dose among participating countries were periodically conducted by IAEA, and the results obtained by CRP were well within acceptable limits.

In 2001, the reference dosimeters maintained by CRP calibrated a total of 353 radiation devices comprising 305 survey meters and 48 quartz fibre electrometers (QFEs) used by companies and hospitals in Singapore.

International Collaboration
CRP was honoured to be recognised by the IAEA as a regional training centre for fellows. Under the Singapore-IAEA Memorandum of Understanding signed in 2001, CRP hosted a 2-week IAEA Training Course on Safety Assessment Methodologies for Near Surface Radioactive Waste Disposal from 26 November to 7 December 01. There were 22 participants from 17 member countries, and CRP also provided radiation safety training to fellows from Bangladesh, Jordan, Myanmar and Vietnam.

**Quality Assurance & Standards**
CRP implemented the quality assurance (QA) and other radiographic standards and procedures in mammography.

**The Year Ahead**
In the year ahead, CRP will be incorporating mammography QA requirements under the Radiation Protection Regulations. In addition, the Centre will undertake the formulation and drafting of the EMF Regulations as well as the Composition of Fines Regulations under the Radiation Protection Act. Another strategic area of focus will be the education and training of industrial radiographers and dental assistants on radiation safety.