HOWARD UNIVERSITY

Department of Radiation Oncology

Mr. Hector Bermudez
U.S. Nuclear Regulatory Commission
Division of Nuclear Materials Safety, Region I
475 Allendale Road
King of Prussia, PA 19406-1495

B-1
03-03015-07 / 03-00386-19
03001321 03011063

RECEIVED
REGION 1
2010 APR 19 AM 10: 32

April 15, 2010

Dear Mr. Bermudez:

On Monday, April 12, 2010 Satya Ranjan Bose, PhD, ABR officially began working at Howard University as the radiation safety officer, with the title Director of Radiation Safety.

Dr. Bose has extensive experience as the radiation safety officer and lead physicist at the University of Pittsburgh Medical Center (UPMC) systems prestigious Arnold Palmer Cancer Pavilion and Jefferson Cancer Center from June 2002 through December 2, 2006. In addition, during the same time period, he was the auditor of the UPMC physics quality assurance program and implemented Medical Physics Quality Management and Quality Assurance programs. He was instrumental in the commissioning of the radiation therapy equipment at the Walter Reed Army Medical Center under a contract agreement from December 2006 through March 2009, before working as chief physicist from May 2009 to the present for Radiotherapy Associates of Upstate New York, Syracuse, NY where he was in charge of radiation protection and safety in-services to the radiation workers according to 10NYCRR Part 16 regulations.

Even more impressive, he holds a Master of Sciences in Nuclear Engineering specializing in health physics and radiation protection research from the University of Virginia and a Master of Sciences in Nuclear Engineering specializing in radioactive waste management and environmental monitoring research from the University of Arizona, Tuscon before earning a Ph.D. in nuclear engineering (medical physics minor) specializing in boron neutron capture therapy research, also from the University of Virginia.

He has certifications and extensive experience in using both the Nucletron and VariSource machines, certified by the NRC as an authorized physicist to perform HDR and has certification on planning, organization and implementation of

144623 / 144624

NMSS/RGN1 MATERIALS-002

2041 Georgia Avenue, NW, BA-07
Washington, DC 20060

Telephone 202 865 1421
Facsimile 202 865-1723
www.howard.edu

HOWARD
UNIVERSITY

Department of Radiation Oncology

radiation protection from the U.S. National Research Council in 1987 and 1992 and was awarded an IAEA fellowship on radiation protection early in his career in 1986.

He is a member of the American Association of Medical Physicists, American Society of Radiation Oncology, Health Physics Society and Alpha Nu Sigma Honor Society. He will spend 50% of his compensated time in radiation safety, which is directly paid by Howard University.

We are very pleased to have such an outstanding leader in radiation safety join the Howard University faculty.

I have attached Dr. Bose's curriculum vitae for your review.

Sincerely,

Oscar E. Streeter, Jr., MD, FACRO
Radiation Safety Committee Chairman
Professor and Chair, Radiation Oncology

Cc: Eve J. Higginbotham, SM, MD
Senior Vice President and Executive Dean for Health Sciences

Cc: Celia J. Maxwell, MD, FACP
Assistant Vice President for Health Sciences

Cc: Robert E. Taylor, MD, PhD, FACP
Dean, Howard University College of Medicine

Cc: Mr. Larry Warren
Chief Executive Officer, Howard University Hospital

2041 Georgia Avenue, NW, BA-07
Washington, DC 20060

Telephone 202 865 1421
Facsimile 202 865-1723
www.howard.edu

Satya Ranjan Bose, Ph.D., ABR

[redacted]

Phone: [redacted] (cell): [redacted] (home)

E-mails: [redacted]

Citizenship: [redacted]

CAREER INTERESTS

- Primary Interest to work as a Chief/Senior Medical Physicist and Radiation Safety Officer
- Other interests include Teaching, Research & Development activities in Radiation Oncology Physics

EDUCATION

Ph.D., Nuclear Engineering (Medical Physics Minor), January 2000. Specialization in Boron Neutron Capture Therapy Research. University of Virginia (UVA), Charlottesville, Virginia.

M.S., Nuclear Engineering, May 1996. Specialized in Radioactive Waste Management and Environmental Monitoring Research. University of Arizona (UA), Tucson, Arizona.

M.S., Nuclear Engineering, May 1988. Specialized in Health Physics & Radiation Protection Research. University of Virginia (UVA), Charlottesville, Virginia.

M.S., Chemistry, November 1977. Specialized in Organic Chemistry. University of Chittagong (CU), Bangladesh.

B.S., Chemistry, Physics & Mathematics, December 1972. University of Dhaka (DU), Bangladesh.

PROFESSIONAL EXPERIENCES

Chief Physicist, 5/2009-present. Radiotherapy Associates of Upstate New York, Syracuse, NY.

Primary responsibility includes, but not limited to:

- High Dose Rate (HDR) Brachytherapy using Nucletron. HDR performed on MammoSites, gynecological, esophageal and endobronchial cases
- Cs-137 Low Dose Rate (LDR) Brachytherapy using Therapac
- External Beam IMRT using **Nomos Corvus** treatment planning system
- External Beam 2D/3D & IMRT using **CMS XIO** treatment planning system
- IMRT QA and Dosimetry double checks
- Monthly and yearly QA's on Varian Linacs
- Oversee overall medical physics and radiation dosimetry services for **five free standing** cancer centers
- Supervise physicist, dosimetrists and technical staff of the department
- Radiation Protection & Safety In-services to the Radiation workers according to *10NYCRR Part 16* regulations
- Oversee maintenance and performance of radiation producing equipments i.e. CT scanner, simulator units, linear accelerators, Nucletron HDR treatment unit
- Radiation shielding calculations for linac vaults

- Purchase of Varian 21iX machine with OBI and Cone beam modalities
- Purchase of eclipse treatment planning software including Rapid Arc planning option
- Purchase of Varian Aria Record Verification system
- Working on creating paperless electronic data base for permanent medical records

Consulting Medical Physicist (Sanchoy, PA), 12/06-3/09. Walter Reed Army Medical Center (WRAMC), Washington DC.

Primary responsibility includes, but not limited to:

- Linac acceptance and commissioning (Trilogy with cone beam and OBI)
- Implementation of IMRT protocols and treatments procedures using eclipse TPS
- Stereotactic Radiosurgery (SRS &SRT) using the BrainLab system
- Commissioning of PBC & AAA beam configuration Models for eclipse TPS
- Commissioning of eMC beam configuration for eclipse TPS
- Performing IMRT treatment plans and QA using MapCheck
- Treatment dosimetry review and weekly Chart Checks
- US based prostate volume study, pre-plan & post plan using Varian VariSeed
- LDR (Cs-137) planning using Varian eClipse BrahyVision.
- Attends departmental daily morning meetings
- Improvements of departmental physics quality assurance program using the latest TG protocols

Clinical Assistant Professor, 06/02–December 02, 2006, Radiation Oncology Department, University of Pittsburgh Medical Center (UPMC), Pittsburgh, PA. Worked as a Lead **Physicist** for the following four cancer centers:

(1) UPMC Jefferson Cancer Center (Lead **Physicist)**
(2) UPMC Latrobe Area Hospital (Lead **Physicist)**
(3) UPMC Arnold Palmer free standing cancer pavilion (Lead **Physicist**)
(4) UPMC Natrona Heights free standing cancer center **(**Lead **Physicist)**

In addition, I was responsible to provide physics coverage for the following sites:

(1) UPMC Robert E. Eberly Pavilion free standing cancer center
(2) UPMC cancer center at St. Clair Hospital
(3) UPMC Presbyterian Hospital
(4) UPMC Washington Hospital
(5) UPMC JP Martha Cancer Pavilion
(6) UPMC Mercy Hospital

Primary responsibility includes:

- IMRT, calibration and quality assurance (QA) of linear accelerators (Varian 23iX Trilogy, Varian 23EX and Siemens Oncor).
- IMRT plan verification - performed by absolute MU measurements on a solid water phantom and film dosimetry (using RIT software).
- Weekly chart checks, treatment plan evaluation and dosimetry (MU) checks
- HDR planning and treatments using Nucletron Plato system. HDR treatments are performed mainly on prostate, gynecological, esophageal and endobronchial cancers
- External beam 3D planning - performed by Varian Eclipse and Philips ADAC software. Treatment planning workstations are networked with Varian VaRis with eclipse, and Philips ADAC Pinnacle with IMPAC

- In-vivo dosimetry on external beam plans using TLD's/mosfets and diodes
- Radiation Safety Officer at Jefferson and Arnold Palmer free standing cancer pavilion
- Conduct Research and Development activities in medical physics

Other responsibility includes, but not limited to the following:

- Acceptance test and commissioning of Varian 23iX (Trilogy) and Siemens machines
- Acquire and Modeling beam data & commissioning eclipse treatment planning system
- Monthly QA on Linacs, CT Simulator (GE Light Speed) and Simulators
- Monthly QA and calibration of Varian portal imaging system
- Auditor of UPMC physics quality assurance program
- Teaching physics and radiation protection
- Participate in RTOG protocols
- Implementing retrospective respiratory gating system
- Implementing LDR prostate seed implant program
- Implementing MammoSite brachytherapy program
- Implementing Medical Physics Quality Management & Quality Assurance programs according to AAPM's Task Group (TG) protocols
- Conducting research and development activities in medical physics
- Establishing New Cancer Centers at UPMC Health System

Radiation Oncology Physicist, 05/01-05/02, Radiation Oncology Department, US Oncology, Longview Cancer Center, Longview, TX 75601. **In-charge** of physics, dosimetry and radiation protection and safety programs. Perform machine calibration and quality assurance (QA) linear accelerators (Varian 2100C & 2100EX). Check treatment planning dosimetry and charts in the treatment of 70-75 external beam patients per day. Treatment planning is accomplished utilizing an Elekta RenderPlan 3D RTPS hardwired to a Toshiba helical CT and a Ximitron simulator. Perform HDR treatment planning (Nucletron Plato), Coronary Intravascular Brachytherapy using the Beta-Cath system and US guided prostate seed implants (Prowess & MMS systems).

Other responsibility includes acceptance test and commissioning of a Varian 2100EX linear accelerator, implementation of *in vivo* diode dosimetry system for patient dose verification (RF-IVD- Sun Nuclear Corporation.), TG-51 protocol for 2100C & 2100EX linear accelerators, RSO duties in compliance with the state of Texas regulations, Physics and dosimetry administration including billings

Medical Physicist, *05/00-01*, Radiation Oncology Department, Saint Francis Hospital and Medical Center, Topeka, KS. Primary responsibility includes quality assurance (QA) and calibrations of linear accelerators (Siemens/Varian), superficial x-ray unit (Picker), acceptance testing, stereotactic biopsy and radiosurgery, US guided prostate seed implants (^{103}Pd/^{125}I), intracavitary-GYN (^{137}Cs), TLD dosimetry, brachytherapy and external beam treatment planning, (ROCS & 3D ADAC Pinnacle with IMPAC verification system) dosimetry review and chart checks, leak testing, purchase and QA of brachy sources, survey meter calibration and consistency checks on ion chambers. Other duties include radiation safety procedures (member safety committee) and R&D activities to improve quality of treatment procedures. Working on an amendment to start coronary intravascular brachytherapy.

Radiological Physicist, *12/97-4/26/00*, Radiological Physics Division, Department of Radiation Oncology, Medical Center, UVA. Primary responsibility included brachytherapy procedures (LDR&HDR); intracavitary-GYN (^{137}Cs), US guided prostate seed implants (^{103}Pd/^{125}I), interstitial implants (Ir-192, Au-198), intravenous (^{32}P), pterygium (^{90}Sr), Gammamed based HDR (^{92}Ir), thyroid cancer (^{131}I), TLD dosimetry, quality assurance, purchase of radioisotopes

and supplies, inventory, and teaching x-ray technology courses. Secondary tasks involved QA on linac Varian 2300 & use of ^{60}Co unit for R&D activities.

Research Specialist, Senior, *5/96-11/97*. Department of Mechanical, Aerospace and Nuclear Engineering, UVA. Studies include design and construction of an In-pool Small Animal Irradiation Neutron Tube (SAINT) for BNCT/small animal research. Characterization of SAINT neutron and gamma-ray beam by foil activation and MCNP & DORT computer code calculations. Conducted experiments on BNCT to investigate the response of human breast carcinoma both in ***In-Vitro*** and ***In-Vivo*** Nude Mouse Animal models.

Conducted radiation surveys including measurement of radioactivity levels in air, soil, reactor effluents and surface water on a routine basis for compliance with NRC regulations.

Health Physicist (student position), *5/93-4/96*. Radiation Control Office, UA, Tucson. Performed environmental radioactivity monitoring in soil and water around UA campus as well as on a radioactive repository site in Tucson.

Operator for Cobalt-60 Irradiation Facility (student position), *5/93-4/96*. Department of Nuclear and Energy Engineering, UA, Tucson. Operated 4000 Ci ^{60}Co irradiation facility.

Senior Scientific Officer, *1/87-5/92*. Health Physics Division, Bangladesh Atomic Energy Commission (BAEC), Dhaka, Bangladesh. Performed R&D, routine and regulatory activities pertaining to Health Physics, Radiation Protection and Analytical Chemistry in compliance with national as well as IAEA regulations.

IAEA Fellow and Research Assistant, *8/86-8/87* and *9/87-5/88*. Department of Nuclear Engineering, UVA, Charlottesville. Measured radioactivity levels in UVA reactor effluents, pond sediments and surface soils.

Scientific Officer, *5/78-12/86*. Health Physics Division, BAEC, Dhaka, Bangladesh. Performed R&D and regulatory activities in the areas of Health Physics, Radiation Protection and Analytical Chemistry in compliance with national as well as IAEA policies and regulations.

TEACHING EXPERIENCE

Radiological Physicist, 3/98-4/00. UVA Medical Center, Teaching Physics, Radiation Protection and Mathematics to X-ray Technology students.

Medical Physics, 06/02–December 02, 2006. University of Pittsburgh Medical Center (UPMC), Pittsburgh, PA. Taught medical physics to residents in radiation oncology residency program.

Computer Lab Consultant, *3/93-4/96*. Department of Residence Life, UA. Demonstrated Perfect Office™, Microsoft Office™ and Unix system to students.

Teaching Assistant, *8/92-4/96*. Department of Nuclear and Energy Engineering, UA. Graded homework, quiz/test in (i) Health Physics, (ii) Radioactive Waste Management, (iii) Radiation Effects and (iv) Solar Energy.

CERTIFICATIONS

- ABR-Therapeutic Radiologic Physics
- Certified by NYS Education Department in Medical Physics-Therapeutic Radiological
- Certified by the NRC as an authorized physicist to perform HDR
- Certified by the University of Pittsburgh, PA as an authorized physicist to perform HDR
- Certification on Therapeutic Radiological Physics from the Texas Board of Licensure for Professional Medical Physics in 2001-2004.
- Certifications on Planning, Organization and Implementation of Radiation Protection from the US National Research Council in 1987 & 1992.

PROFESSIONAL SOCITIES

Member American Association of Medical Physicists (AAPM), 2001
Member American Society for Therapeutic Radiology and Oncology (ASTRO), 2004
Member PA local chapter for AAPM, 2003
Member Alpha Nu Sigma Honor Society, 1993
Member Health Physics Society, 1993.

AWARDS

Deans Fellowship, School of Engineering and Applied Science, UVA, 1999.
UA graduate tuition & registration scholarship, 1992-95
UA Hilberry scholarship, 1993-94;
IAEA fellowship on Planning, Organization and Implementation of Radiation Protection, 1992;
IAEA fellowship on Radiation Protection, 1986-8

LIST OF PUBLICATIONS AND PRESENTATIONS

PAPERS/ABSTRACTS

1. Bose, S.R., Huq, S., Bahri, S., Lalonde R., Selvaraj, N., Brandner E. and Ning J. Comparison of High Dose Rate (HDR) Vs Intensity Modulated Radiation Therapy (IMRT) for Prostate Boost Treatment. (2005). 47th meeting of the AAPM, Seattle,WA, July 25-28.

1. Bose, S.R., Brandner, E., Selveraj R,, Bahri, S and Wu, A. (2004). Measurement of Neutron Dose for IMRT plans using 23 MV photon beam. (2004) International Journal of Radiation Oncology, Biology-Physics, Volume 60, Number 1 Supplement.

2. Bose, S.R., Brandner, E., Selveraj R,, Bahri, S and Wu, A. (2004). Investigation of Neutron Dose in Intensity Modulated Radiotherapy for High Energy Photon Beam. 46th Annual Meeting of the American Association of Physicists in Medicine, Pittsburgh, PA.

3. Bose, S.R., Roger A. Rydin, Mulder, R.U., Moore Marcia, and Wu, A. (2003). Nude Mouse Model for Boron Neutron Therapy of Human Breast Carcinoma. 45th Annual Meeting of the American Association of Physicists in Medicine, San Diego, CA. Abstracts published.

4. Bose, S.R. (2000). Experimental Evaluation of Boron Neutron Capture Therapy of Human Breast

Carcinoma implanted on Nude Mice. Ph.D. Dissertation. Department of Mechanical, Aerospace and Nuclear Engineering, Charlottesville, University of Virginia.

5. Bose, S.R., Burns, T.D. Mulder, R.U., and Rydin, R.A.(1999). Optimization of Neutron Beam in a Mouse Capsule for An In-pool Small Animal Irradiation Neutron Tube. Transactions of American Nuclear Society Volume 81, Long Beach, California. November.

6. Bose, S.R., Mulder, R.U., Rydin, R.A., Hubbard, T.R and Burns, T.D. (1997). Neutron Flux profile Determination for An-In-Pool Animal Irradiation Facility. Transactions of the American Nuclear Society, Volume 77, Albuquerque, NM, November.

7. Bose, S.R., Sondhaus, C.A., Wacks, M.E., Silvain, D. and Mulder, R.U. (1997). Benchmark Environmental Radioactivity at a research reactor site. Proceeding of International Wastemanagement Symposia, Tucson, Arizona.

8. Bose, S.R.(1996). Low Level Radioactivity in the University of Arizona on and off campus soils. Master of Science Thesis. Department of Nuclear and Energy Engineering, University of Arizona.

9. Bose S.R., Williamson T.G., Mulder R.U. and Molla M.A.Rab (1993). Impact of a Two megawatt research reactor on radioactivity in Sediment. **Health Physics, 65(2):199-207.**

10. Bose S.R., Mulder R.U. and Williamson T.G. (1992 Radioactivity in Central Virginia non-cultivated Soils. Journal of Bangladesh Academy of Science, Dhaka University, Dhaka, Bangladesh.

11. Bose S.R. (1988). Radioactivity in Central Virginia Sediments and Soils. Master of Science Thesis. Department of Nuclear Engineering and Engineering Physics, University of Virginia, Charlottesville, U.S.A.

PRESENTATIONS

1. Bose S.R., Mulder R.U. and Williamson T.G. (1988). Measurement of radioactivity in Albemarle county soil samples. Proceedings, Virginia Academy of Science meeting, University of Virginia, May 26.

2. Bose S.R., Molla M.A.Rab and Ullah S.S. (1986). Radioactivity in Fish, Water and Sediments. Proceedings, 11th Annual Bangladesh Science Conference, March 2-6.

3. Bose S.R., Miah J.A.and Jahan H. (1986). Cesium-137 in the Atmospheric air of Dhaka in 1984. Proceedings, 11th Annual Bangladesh Science Conference, March 2-6.

4. Banu B., Bose S.R., Miah F.K. and Molla M.A. Rab. (1986). Cs-137 and ^{40}K in soil and vegetables. Proceedings, 11th Annual Bangladesh Science Conference, March 2-6.

5. Molla M.A. Rab, Bose S.R. Alam M.N., Roy S., Rahman M.M. and Miah F.K. (1985). Radioactivity in Fish. Proceedings, 10th Annual Bangladesh Science Conference, March 22-27.

6. Molla M.A.Rab, Bose S.R., Begum M., Miah J.A. and Roy S. (1985). Strontium-90 in the Atmospheric air of Dhaka. Proceedings, 10th Annual Bangladesh Science Conference, March 22-27.

7. Molla M.A. Rab, Begum A., Bose S.R. and Begum M. (1985). Determination of Thorium in biological samples by Alpha Spectrometry method. Proceedings, 10th Annual Bangladesh Science Conference, March 22-27.

8. Molla M.A.Rab, Bose S.R., Alam M.A. and Roy S. (1984). Application of a High Purity Germanium Detector in Environmental Monitoring. Proceedings, 9th Annual Bangladesh Science Conference, March 3-7.

9. Molla M.A. Rab, Bose S.R., Jahan H., Roy S., Alam M.N. and Mollah A.S. (1984). Radioactivity in Fish. Proceedings, 9th Annual Bangladesh Science Conference, March 3-7.

10. Miah J.A., Molla M.A. Rab and Bose S.R. (1984). Radioactivity in the atmospheric air of Dhaka over the period January 1983-December 1983. Proceedings, 9th Annual Bangladesh Science Conference, March 3-7.

11. Miah A.J., Molla M.A. Rab and Bose S.R. (1983). Gross beta and ^{90}Sr activity in the Atmospheric air of Dhaka over the period 1978-82. Proceedings, 8th Annual Bangladesh Science Conference, February 5-9.

12. Molla M.A. Rab, Bose S.R., Begum M. and Jahan H. (1983). Radioactivity in Fish. Proceedings, 8th Annual Bangladesh Science Conference, February 5-9.

This is to acknowledge the receipt of your letter/application dated

4/15/2010, and to inform you that the initial processing which includes an administrative review has been performed.

☑ AMCND. 08-03075-07 / 08-00386-09
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

---

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 144623/144624.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader