

# CHRIS MARCUS

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- CAREER OBJECTIVES:** A diversified, R&D position that will apply/expand my capabilities both in mass spectroscopy and vacuum science as associated with nuclear energy research.
- EDUCATION:** Master's Degree in Business Education (with emphasis in Operations Management), Lincoln Memorial University, Harrogate, TN, December 1990.  
B.S., Chemical Engineering, Univ. of Tennessee, Knoxville, TN, August 1986.
- TECHNICAL PAPERS:**
- The Reduction and Distillation of Zinc Isotopes under High Vacuum Conditions (C. Marcus, L. A. Zevenbergen, Nucl. Instr. and Meth. A 438 (1999) 30-35)
- Tests of He/D2 Discrimination via Mass Spectrometry for the ITER Diagnostic RGA System (T. M. Biewer, C. Marcus, et. al.) *publication pending*
- The Design and Operation of a Propellant Gas Recirculation Loop for Testing of Pellet Injector Fast Valves in Support of US-ITER (C. Marcus) *publication pending*
- EXPERIENCE:**
- October 2011 – Present  
**U.T.-Battelle/Measurement Science and Systems Engineering Division**  
*R&D Engineer for the Fusion Energy Division - U.S. - ITER Project*
- Design, assemble, and operate system hardware for analyzing gas species (H, D2, He) using both quadrupole-based, ion trap, auto-resonance RGAs, and Optical Penning Gauges for support the US-ITER DRGA R&D (co-author with T. M. Biewer on poster presented at TOFE – 2012; Nashville, TN).
  - Design, assemble, and operate a HP-gas propellant loop to support testing of 2-stage fast valves designed for the US-ITER feed pellet injection system R&D (presented work as poster at TOFE – 2012; Nashville, TN).
- March 2008 – January 2012  
**ORNL-USEC CRADA: American Centrifuge Program (S-RD work)**  
*R&D Lead Test Engineer*
- Coordinated and led specific gas (UF<sub>6</sub>) centrifuge and mechanical testing to validate performance for machine prototypes: precursor to production centrifuge assembly at the commercial plant in Piketon, Ohio to support the United States Nuclear Fuel Cycle
  - Analyzed SWU data and process hardware trends from centrifuge test runs using “NI-MAX”, Mathcad, and other DAS software
  - Led design, procurement, and operation of magnetic-sector and quadrupole RGA systems to support machine diagnostics
  - Operated and diagnosed vacuum systems in support of RGA and centrifuge machine development.

May 1995 – March 2008

**U.T.-Battelle/Nuclear Science and Technology Division/Isotope Enrichment Facility (IEF) at the Y-12 Plant**

*Design/Process/Quality Engineer and Chemist*

- Performed lectures and tours on the calutron (EMIS) process for guests and the NSPO training program as part of the nuclear fuel cycle
- Functioned as the ORNL  $^{252}\text{Cf}$  Program Coordinator for leased and loaned  $\eta$ -sources (encapsulated) in the REDC inventory at 7930
- Performed vacuum system maintenance and troubleshooting on pyro-chemical units
- Dispensed isotopic gases ( $^3\text{He}$ ) via direct and compressor system transfer
- Supervised and performed maintenance activities for preserving calutron operational capabilities; therein, assigned role of LSM for the calutron facility within Building 9204-3 (Y-12)
- Developed and managed the ORNL-IDG ISO-9000 Quality Management System (U.L.-certified since 1996)
- Participated in the magnet cool down (20,000 Gauss) and power system refurbishment effort for the plasma separation process (PSP) for the Theragenics Corp. - Oak Ridge Facility
- Designed and performed pyro-chemical, reduction-distillation reactions using isotopically-enriched feed material and an array of unique process components. This work became the basis of a technical presentation (see tech. paper ref. above)
- Retrofitted and refurbished an ion-exchange (I-X) system for purification runs to isolate  $^{144}\text{Nd}$  (isobaric impurity) from isotopically-enriched  $^{144}\text{Sm}$  batches. Became familiarized with Rb-Cu separation techniques using I-X
- Performed a majority of the protocols, including leak-testing, component fabrication, and final inspection, associated with a neutron dosimetry assembly project for reactor core neutron flux studies (GE-sponsored)
- Operated the calutrons to electro-magnetically separate (enrich) stable isotopes, for applicability in the medical and research industry
- Performed process diagnostics on calutron ancillary and subassembly equipment which included vacuum, cooling, and electrical systems
- Performed wet chemistry techniques in the IEF Chemical Recovery Lab to prepare and refurbish calutron feed (charge) material and components
- Processed enriched, stable isotopes using wet chemistry fundamentals

May 1991 - May 1995:

**Martin Marietta Energy Systems (MMES), K-25 Site Quality Division**

*Quality Engineer {matrixed to Waste Management (March 1993 - May 1995), Technical (October 1992 - March 1993), and AVLIS (May 1991 - October 1992) Divisions}*

- Used causal analysis to develop and validate corrective action (C/A) plans
- Verified the closure of C/As through inspection and documentation reviews
- Led technical, programmatic assessments to evaluate compliance to regulatory and procedural requirements
- Developed occurrence reports reportable to DOE.
- Developed programmatic metrics and statistical process indicators

October 1989 - May 1991

**DeRoyal Industries, Inc./Qualtex Tray Division**

*QC Supervisor/Project Coordinator, Quality Control Department*

- Managed inspections in the assembly process of medical devices through the application of quality check points per the applicable military, FDA, and GMP standards for raw materials and finished goods.
- Responsible for ensuring that finished products were maintained in compliance with applicable FDA and GMP regulations.
- Coordinated plant projects implementing SPC techniques to identify and correct process anomalies (e.g., packaging failures and product sterility testing).

May 1987 - October 1989

**DeRoyal Industries, Inc./Qualtex Tray Division**

*QA/QC Technical Analyst, Quality Control and Sterilization Departments*

- Implemented engineering and microbiological controls required for ethylene oxide sterilizers per the applicable AAMI and EPA guidelines regulating the industrial sterilization of medical devices.
- Developed, reviewed, and approved training programs, critical equipment inventories, operating procedures, and process documentation.

**SPECIALIZED  
CREDENTIALS:**

- Continuing educational credit for applied welding (MIG, TIG) techniques (BS-VT School – Knoxville; 2006-2007)
- Maintaining an active "Q-clearance"
- Proficient in basic shop/machining skills
- Lab experience in testing radiation detection instrumentation parameters using low-level  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\eta$  sources as well as RF interferences (two-month period at MSSD; CY 2011)
- Lab experience in developing and applying vapor explosion technologies for use as high-energy propellants to deliver atypical ballistics from conventional weapon components (six-month assignment at ESTD; CY 2001)

**AWARDS:**

- USEC Appreciation Gift for meeting production prototype milestones (2010)
- U.T.-Battelle bonus recipient: Adm. of  $^{252}\text{Cf}$  Lease/Loan Program (2005)
- LMER bonus recipient:  $^{233}\text{U}$  Storage Inspection Project (1999), INTDS presentation (1998), and Dosimeter Project for General Electric (1997)
- ORNL President's Award: ISO 9000 Certification at the IEF (1996)
- LMES Silver Dollar Award: K-25 Energy Savings Suggestion (1993)

\*References available upon request\*