

JOEL HATCH, PHD

SENIOR ENGINEER

VOICE: 740.369.8811 FAX: 740.369.8866

EMAIL: joel.hatch@ats-3me.com



Joel has been associated with ATS for several years in a consulting capacity and now serves as an Associate Senior Engineer and Special Projects Manager. His extensive expertise and experience in aging degradation of materials, particularly of electronic components and systems, supports ATS' cutting edge capabilities in reliability engineering and qualification testing.

- Responsibilities:**
- Develop and implement rational & conservative accelerated aging protocols including effects of temperature, radiation, and vibration.
 - Design and implement processes to quantify and improve endurance of electronic devices.
 - Develop test procedures and standards for measuring and evaluating instrumentation operational performance under various environmental conditions.
 - Test electronic, electro-optic, and electro-mechanical instrumentation components and devices.
 - Design, plan, and manage radiation tests and experiments.
 - Direct research and development.
 - Provide customer consulting and contract professional services as required.

Professional Experience:

The Ohio State University Nuclear Reactor Laboratory

Research Assistant / Reactor Operator: 2011 – present

Senior Reactor Operator: 1987 – 1993

Reactor Operator / Staff: 1981 - 1987

- Design, repair, and develop nuclear instrumentation for Research Reactor.
- Develop test and maintenance procedures, guidelines, and standards.
- Perform radiation testing of and analysis of electronic and electro-optic devices.
- Perform various experiments to measure nuclear physics of reactor.
- Operate nuclear reactor.

Consulting

Radiation effects on parts, materials, and processes: 1997 – present

- Served as lead adviser for parts, materials, and Process Control Board for selection and test of electronic parts & devices for use on spacecraft, rovers, satellites, and launch vehicles.
- Monitored vendor quality and manufacturing processes.
- Developed test techniques and procedures for evaluating electronic parts and components for use on launch vehicles and satellites in a variety of cosmic environments, e.g., radiation, thermal, and vibration.



Professional Experience:

Consulting (continued)

- Analyzed, measured, and evaluated electronic parts and associated radiation effects data. Determined component operational behavior / risk associated with circuit performance from Pre-Launch to End-of-Life conditions to ensure mission success.
- Provided guidance in part selection to meet NASA and Customer's quality and reliability requirements.

Bell Laboratories → Celiant Corp → Andrew Corporation

Reliability / Test / Quality Manager: 1999 – 2007

- Served as Quality Manager for telecommunication products in the Americas, Southern Europe, and Southeast Asia.
- Reviewed, directed and qualified two major Contract Manufacturing companies to meet quality requirements and guidelines.
- Implemented SPC and 6-Sigma programs to control manufacturing processes across several product lines.
- Developed various test techniques for environmental stress screening / burn-in of cellular base station amplifiers.
- Developed and promulgated HALT / ALT guidelines, standards, and procedures.
- Designed flexible, cost effective, test platform to serve across multiple amplifier designs.

SRICO Inc.

Director of Fiber Optic Test Laboratory: 1995 – 1997

- Coordinated R & D test and production program.
- Developed test requirements and procedures to comply with NASA, Military and ASTM standards, guidelines and test methods.
- Assisted in the development of high-speed (>5 GHz) fiber optic based sensor systems.

Science and Engineering Associates

Consultant: 1996 – 1997, Senior Engineer: 1993 – 1995

- Developed and implemented fiber optic radiation testing quality assurance program.
- Co-authored NATO/NUTEG and EIA/TIA standards and guidelines for testing of electro-optic components.
- Formulated and promulgated acceptance policy & guidelines for McClellan Air Force Base's Cobalt-60 irradiators and assisted in gaining approval and certification by A2LA.
- Designed, developed, and assembled various automated fiber optic based part (device) and system test programs for degradation caused by neutrons and gamma rays.



Education:

Madison University

- PhD in Engineering Management: 2005 - 2010

The Ohio State University

- MS in Mechanical Engineering – Nuclear Instrumentation: 1989 - 1993
- BA in Biochemistry: 1981 - 1987

Professional Affiliations:

- Member ASTM F1-11 subcommittee
- Member Space Parts Working Group (SPWG) and Radiation Hardness Assurance Committee (SPWG-HAC)
- IEEE
- SPIE

Public Domain Publications:

- w/ Abhay Joshi, Shubhashish Datta, Abigale Joshi, Michael Sivertz, & David Inzalaco, *Radiation Testing of 25 Gbaud Balanced Photoreceivers with Bismuth Ions for Linear Energy Transfer Exceeding 70 MeV-cm²/mg*, Proc. SPIE 13062, Sensors and Systems for Space Applications XVII, 1306207 (Presented at SPIE Defense + Commercial Sensing: April 24, 2024
- w/ Thomas Shocklee, Chase Pownell, & Collin Schairer, *Single Event Effects Test Report for: SmartFusion2 SMF2 FPGA SoC – Flux vs Event Rate*, provided to Defense Common Parts Testing in Radiation Project, Jun 2024
- w/ Antoni Hatch, *SEE Test Results for COTS High Speed LVDS Driver and Receivers*, RADECS 2022, 22nd European Conference, Oct 2022
- w/ Brittany Butterworth, *Recent Single Event Transients, Upsets, and Latchup Test Results for TPS3307-18, TL1431, INA129, AM26LV31 & 32 Electronic Parts*, RADECS Apr 2019 (preprint)
- *LM185 Voltage Reference Radiation Tests: Variable Temperature and Bias Conditions*, Radiation Effects Data Workshop, presented at RADECS 2011, Seville, Spain, SEP 2011
- *Qualification of COTS Optocoupler*, paper no. 3714-22, presented at SPIE, Orlando Florida, 1999
- *Radiation Damage to TSL235 light-to-frequency converters*, Photonics for Space Environments VI, 22JUL98, SPIE Vol. 3440, San Diego, Calif., 1998
- w/ K. Krishnan & W. D. Smith, *Laser Diode Response to Gamma And Proton Radiation*, presented at SPIE Conference, San Diego, Calif. 1997
- w/ several other EIA/TIA committee members, *Procedure for Measuring Radiation-Induced Attenuation in Optical Fibers and Optical Cables*, balloted 1996, revised 1998
- w/ J. McFadden, R. Greenwell, C. Barnes, D. Pentrack & D. Scott, *Measurements and Results of Gamma Radiation Induced Attenuation at 980 nm of Single Mode fiber*, SPIE Vol. 2811, AUG 1996



World Class Engineering for a Safer WorldSM

**Public Domain
Publications:**

- *How Fiber Solves High-Voltage Problems*, U.S. Tech, Fiber Optics and Sensors, JUN 1996
- *Single Point Thermocouple Calibration*, McClellan AFB's Cobalt Irradiation Test Facility, SEGIT, 1995
- w/ R. Greenwell & S. Saggese, *The Use of Remote Fiber Optic Spectroscopic Instrumentation to Characterize Nuclear Waste*, presented at ISA Conference, Denver, CO., MAY 1995
- w/ D. Pentrack, R. Greenwell, & M. Pama, *Effects of Combined Neutron and Gamma Radiation on LiNbO₃ Directional Polarization-Maintaining Coupler (passive) and a Large-Core Multimode 1 x 2 Coupler*, Aerosense 95, SPIE Proceedings, Orlando, FL., Vol. 2482, APR 1995
- w/ D. Pentrack & R. Greenwell, *Radiation Effects Testing of Electro-Optic Components – Allied Signal LiNbO₃ Directional Coupler*, presented to NATO Panel IV, Research Study Group 12, Nuclear Effects Task Group, Royal Military College of Science, Shrivenham, UK, OCT 1994
- *Change in Full Width Half Maximum (FWHM) of AlGaAs LEDs Subjected to Mixed Neutron and Gamma Irradiation*, presented at Fiber Optic Materials and Components, SPIE Conference, San Diego, CA., 1994
- w/ others, *Standard Guide: Procedure for Measuring Ionizing Radiation-Induced Attenuation in Silica-Based Optical Fibers and Cables for Use in Remote Fiber-Optic Spectroscopy and Broadband Systems*, adopted by ASTM, JUN 1994, ASTM E1614-94
- w/ D. Miller, D. Holcomb, & J. Weiss, *An Experimental Performance Assessment of Currently Available Optical Fibers in Nuclear Reactor Radiation Environments*, presented at the American Nuclear Society Topical Meeting on Nuclear Plant Instrumentation, Control, and Man-Machine Interface Technologies, Oak Ridge, TN, APR 1993
- w/ D. Miller, M. Haas, M. Jarzemba, & Qun Liu, *The Measurement of the Moderator Temperature Reactivity Feedback in a Natural Circulation Cooled Research Reactor*, presented at the 8th Annual Power Plant Conferences of the American Nuclear Society, Knoxville, TN, MAY 1992
- w/ D. Miller, D. Holcomb, H. Shao, & J. Talnagi, *Optical Fibers in Radiation Environments*, EPRI TR-100367, Electric Power Research Institute, Palo Alto, CA, FEB 1992
- *The Ohio State University Research Reactor Fuel Cutting*, presented at the International Organization of Test, Research and Training Reactors, OCT 1989
- w/ D. Schumm & T. Webb, *Induction of an Oncofetal Marker Protein Upon X-radiation of Rat Mammary Glands*, Cancer Letters, 1989, pp 105 - 108
- *Design and Replacement of The Ohio State University Research Reactor's Safety System*, Transactions of the American Nuclear Society, 14th Biennial Conference on Reactor Operating Experience Plant Operations: The Human Element, AUG 1989