

# Kevin R Cross

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## PROFESSIONAL STRENGTHS

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- Shock & Vibration Environment Simulation
- Multiple Input/Multiple Output and 6 Degree of Freedom Vibration simulation
- Mass Properties Measurement techniques and equipment
- Hazardous Test Planning and Execution
- Data acquisition and signal processing
- Lean/6 Sigma process improvement
- Design of experiments and sampling plans
- Small arms ammunition design and manufacturing

## PROFESSIONAL EXPERIENCE

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### **Sandia National Laboratories.**

9/2011 - Present

Principle Mechanical Engineer, R&D S&E

- Lead a diverse team of engineers and technologists to support system level hazardous testing in two remote test facilities and coordinated the day to day operations of the staff with general guidance from the management team. Integrated and cross trained the staff from both facilities to form a single synergistic team providing increased flexibility and capacity, improved operations and consistency, while focusing on maintain an inclusive and safe working environment.
- Conducted fundamental research in single input single output, multiple input multiple output & 6 degree of freedom vibration test techniques to support improved environment simulation in a laboratory setting ensuring the SNL stays at the forefront of capability and technical capacity.
- Mentored newer staff in the theory and execution of vibration tests. Allowed staff to shadow train and provided them various on the job training scenarios to help them develop the critical skills and confidence necessary to lead system level testing at SNL. Provided general and equipment specific training and troubleshooting techniques in support of both mass properties and shock and vibration testing. Provided review for staff members to help them develop and execute complex hazardous test plans as well as advanced test methodologies in multiple input and multiple output and combined environment testing.
- Developed and executed test plans and processes to safely support environmental testing for the B61-12, W88-Alt370 and AHW systems containing multiple high-level hazards (Explosives, Radiological, Pressure, Thermal, etc.) requiring various levels of management & safety committee reviews for test approvals. These test series provided the B61 and W88

systems with evidence supporting final system qualification for stockpile production. The AHW system tests provided evidence supporting qualification of the range safety requirements to launch the prototype system.

- Conceived, Procured and coordinated the installation of several state of the art multi-million-dollar pieces of equipment to improve or add new capability, meet current and future environmental test demand. Installation activities included leading design teams to provide the technical scope and requirements necessary to make significant changes to the facilities mechanical, structural and electrical infrastructure to support the new equipment.
- Served as reference and subject matter expert in both Mass Properties and Shock and Vibration testing for the nuclear weapons complex and many outside and international test facilities including LANL, LLNL, KC, DOD-MDA, Lockheed Martin, McDonnell Douglas, the British Atomic Weapons Enterprise and others.
- Coordinated with system level team leads and managers in the B61, W88 and W80 NW-LEP programs as well as the AHW and other division 5000 Missile programs to understand their current and future test needs and desires, solicited funding to meet those needs and developed improvement plans to ensure continued success of the test facilities.

### **Remington Arms Company Inc.**

7/2007 – 9/2011

Research Engineer

- Designed and developed new products or expand existing product lines to meet customer specifications, market demands or present new novel concepts for introduction into the sporting arms and ammunition marketplace. The development process spanned the entire spectrum from initial concepts and R&D work through first production runs before being handed off to process engineering. This included responsibility for design and development of manufacturing process, techniques and equipment to integrate within current manufacturing environment to meet volume demands dictated by marketing sales forecasts.
- Designed and Developed Hypersonic Steel shot shell line over a two-year period using a novel ignition chamber design. The new wad design also incorporated a unique shot confinement system that was necessary to maintain pattern performance at the significantly increased speeds allowed by the ignition chamber technology. Both concepts were successfully patented. The product line achieved in excess of \$8 Million in profit its first year and continued to grow in follow on years.
- Modified existing or designed new custom manufacturing equipment in support of new products lines. One such example was a shot gun explosive primer pellet inspection machine. As part of the hypersonic steel line primer pellet consistency was a crucial factor for cold weather performance so an inspection step was necessary. The manufacturing process couldn't be modified and an inspection step couldn't slow down production rates so an automated machine was developed with the support of a electrical engineer that would use a series of non-contact laser displacement gauges mounted on multi-axis servos to measure the pellets and automatically reject non-conforming pieces using a compressed air system. This machine was integrated into the manufacturing process and approved for use with primary explosives after an extensive review.
- Part of a corporate team to find and implement a solution to data management issues

stemming from multiple remote sites needing to work on TWDs and drawings that required inventory and revision controls. Installed the Solid Works EPDM system and became a corporate administrator for the system while also providing training and support to various users.

- Selected to participate in the corporate “Strategic Business Unit” team that interfaced with the executive management team to provide technical feedback on various topics as directed in support of developing short and long term strategies and investments for the corporation.

## EDUCATION

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| <b>Clarkson University</b>  | Potsdam, NY |               |
| ▪ Master of Science degree in Mechanical Engineering                    |             | Class of 2007 |
| <b>Clarkson University</b>  | Potsdam, NY |               |
| ▪ Bachelor of Science degree in Mechanical Engineering<br>minor in math |             | Class of 2005 |
| <b>Hudson Valley Community College</b>                                  | Troy, NY    |               |
| ▪ Associate of Science degree in Engineering Science                    |             | Class of 2003 |

## CERTIFICATIONS

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### **Six Sigma - Black Belt**

- Completed Six Sigma Black Belt corporate certification program from Howard Sanders, PhD based out of The University Of Tennessee, Knoxville TN

### **Solid Works Enterprise PDM - Administrator**

- Completed SolidWorks Enterprise Product Data Management (EPDM) Administrator training through TriMech Solutions

## COMPUTER SKILLS

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Engineering and Mathematical software packages: Matlab, Python, Labview, Data Physics, Spectral Dynamics, Solid Works EPDM, Maple, Mini Tab,  
CAD software packages: Solid Works, Creo, Autocad, 3D Studio Max  
FEM software packages: Algor, Ansys, MARC  
Ballistics software packages: Prodas, Radar 2000  
High Speed Photography: Photron Fastcam  
General Software: Microsoft Excel, Word, Power Point, Project, Outlook, SAP, Photoshop

## PATENTS

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RA BRANDS, L.L.C.. (2009) **Shot Confinement Wad**. 61/149,059.

RA BRANDS, L.L.C.. (2008) **Wad with Ignition Chamber**. 61/113,286.

## **PUBLICATIONS**

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Nelson, G., Cross, K., Hunter, N., “A Systematic Evaluation of Test Specification Derivation Methods for Multi-Axis Vibration Testing,” *International Modal Analysis Conference*, 12-15 February 2018, Orlando, FL.

Hunter, N., Cross, K., Nelson, G., “The Cross Spectrum in Multiple Input Multiple Response Vibration Testing,” *International Modal Analysis Conference*, 12-15 February 2018, Orlando, FL.

Nelson, G., Hunter, N., Cross, K., “Defining the Error of Single and Multi-Axis Vibration Tests: A Move from Qualitative to Quantitative Metrics,” *87<sup>th</sup> Shock and Vibration Symposium*, 17-20 October 2016, New Orleans, LA.

Kevin R. Cross, “Numerical and Experimental Investigations of Bridge Health Monitoring Using Modal Curvature and Instantaneous Phase Methods,” MS Thesis, Clarkson University, November 2007

Cross, K.\*, Jha, R., Whelan, M.\*, Janoyan, K., and Gangone, M., “Bridge Health Monitoring Using Linear and Nonlinear Approaches: Experimental Validation,” The Sixth International Workshop on Structural Health Monitoring, 11–13 Sep 2007, Stanford University, CA.

Cross, K.\*, Jha, R., Whelan, M.\*, and Janoyan, K., “Bridge Health Monitoring Using Linear and Nonlinear Approaches: Numerical Simulations,” The Sixth International Workshop on Structural Health Monitoring, 11–13 Sep 2007, Stanford University, CA.

Cross, K., Jha, R., Whalen, M., Janoyan, K., “Numerical Evaluation of Hilbert-Huang Transform and Fourier Spectrum for Benchmark Bridge Health Monitoring,” *Engineering Mechanics Division Conference of the American Society of Civil Engineers*, 3-6 June 2007, Blacksburg, VA.

Jha, R., Cross, K., Janoyan, K., Sazonov, E., Fuch\*, M., Krishnamurthy\*, V., “Experimental Evaluation of Instantaneous Phase Based Index for Structural Health Monitoring,” SPIE Paper Number 6173-51, *Smart Structures and Materials and NDE for Health Monitoring and Diagnostics*, 26 Feb.-2 March 2006, San Diego, CA

## **PERSONAL INTERESTS**

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Cycling, Motorcycles, Astrophotography, Hiking, Hunting & Fishing, Woodworking, Metalworking