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MECHANICAL SHOCK TESTING EXPERIENCE

MECHANICAL SHOCK IS GENERALLY DEFINED AS A TRANSIENT LOADING WHOSE DURATION IS SHORT RELATIVE TO THE EXCITED SYSTEM'S NATURAL FREQUENCY. THE FIELD OF MECHANICAL SHOCK WAS BORN OUT OF THE NEED TO UNDERSTAND EQUIPMENT FAILURES AND TO DESIGN AGAINST THOSE FAILURES. ITS APPLICATION EXTENDS TO MANY OTHER COMMON ENVIRONMENTS INCLUDING: TRANSPORTATION, DROPS, CRASHES, EXPLOSIONS, AND NUMEROUS OTHER COMMON EVENTS. IT IS ALSO AN ENVIRONMENT THAT IS ALMOST UNIVERSALLY QUALIFIED BY TESTING AND THE SUBSEQUENT ANALYSIS OF THAT TEST DATA.

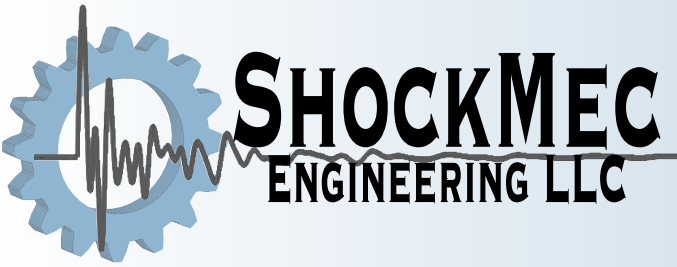
THIS COURSE PROVIDES AN OPPORTUNITY FOR HANDS-ON MECHANICAL SHOCK TESTING IN THE LABORATORY ALONG WITH DATA PROCESSING AND ANALYSIS. SMALL-SCALE DROP SHOCK EXPERIMENTS WILL BE PERFORMED ALONG WITH HIGH-ENERGY SHOCK TESTING ON THE SHOCKMEC ENGINEERING HIGH G-1 RESONANT PLATE SHOCK TEST MACHINE. DATA WILL BE COLLECTED AND PARTICIPANTS WILL BE COACHED THROUGH DATA PROCESSING AND ANALYSIS TECHNIQUES ON THEIR OWN TEST DATA.

INSTRUCTOR

CARL SISEMORE HAS OVER 22 YEARS EXPERIENCE IN THE FIELD OF MECHANICAL SHOCK, BUILT A HIGH ENERGY RESONANT PLATE SHOCK TEST LABORATORY, AND IS COAUTHOR OF A TEXTBOOK ON MECHANICAL SHOCK. HE HOLDS A BS IN PHYSICS FROM GEORGIA TECH AND MS AND PHD DEGREES IN MECHANICAL ENGINEERING FROM TENNESSEE TECH. HE IS A LICENSED PROFESSIONAL ENGINEER IN NEW MEXICO AND VIRGINIA. HIS WORK EXPERIENCE HAS SPANNED THE RANGE OF U.S. NAVY SYSTEMS INCLUDING: MISSILE LAUNCHERS, GUNS, MARINE CORPS WEAPONS SYSTEMS, AND TRIDENT-BASED REENTRY WEAPON SYSTEMS. HE ALSO DESIGNED A UNIQUE HIGH-ENERGY SHOCK TEST MACHINE CURRENTLY IN USE AT SANDIA NATIONAL LABORATORIES. HE HAS WORKED FOR THE DEPARTMENT OF ENERGY AT THE SAVANNAH RIVER SITE, TENNESSEE TECHNOLOGICAL UNIVERSITY, THE NAVAL SURFACE WARFARE CENTER AT DAHLGREN, AND SANDIA NATIONAL LABORATORIES IN ALBUQUERQUE. HE IS CURRENTLY THE CHIEF ENGINEER AT SHOCKMEC ENGINEERING, AN ENGINEERING FIRM AND SHOCK TEST LABORATORY LOCATED IN CEDAR CREST, NEW MEXICO.

REGISTRATION FEE & LOCATION

THE REGISTRATION FEE IS \$800 PER STUDENT FOR THE ONE-DAY CLASS. THE FEE INCLUDES A PRINTED COPY OF THE COURSE MATERIALS, LUNCH, SNACKS, AND ANY NECESSARY LABORATORY SUPPLIES. SINCE THIS COURSE INCLUDES LABORATORY EXERCISES, IT WILL BE HELD AT THE SHOCKMEC ENGINEERING RESEARCH AND TRAINING FACILITY IN CEDAR CREST, NEW MEXICO. THERE IS A MAXIMUM OF SIX PARTICIPANTS PER CLASS TO ALLOW EVERYONE AN OPPORTUNITY TO PARTICIPATE IN THE LABORATORY WORK.



MECHANICAL SHOCK TESTING EXPERIENCE

COURSE TOPICS

1. INTRODUCTION TO MECHANICAL SHOCK

DEFINITION OF MECHANICAL SHOCK; BRIEF HISTORY OF THE MECHANICAL SHOCK FIELD; EFFECTS OF SHOCK ON SYSTEMS; THE NEED FOR DYNAMIC ANALYSIS; THE RELATIONSHIP BETWEEN ACCELERATION, VELOCITY, AND DISPLACEMENT.

2. SHOCK TEST INSTRUMENTATION AND DATA ACQUISITION

SHOCK ACCELEROMETERS; DATA ACQUISITION SYSTEMS; SAMPLE RATE; BIT RESOLUTION.

3. SHOCK DATA ANALYSIS METHODS

TIME DOMAIN ANALYSIS; FOURIER ANALYSIS; SHOCK RESPONSE SPECTRA.

4. DROP SHOCK LABORATORY EXPERIMENTS

SMALL-SCALE DROP SHOCK EXPERIMENTS AND ANALYSIS OF THE RESULTING TEST DATA.

5. RESONANT PLATE SHOCK LABORATORY EXPERIMENTS

SIMULATED PYROTECHNIC SHOCK TESTING ON THE HIGH G-1 RESONANT PLATE SHOCK TEST MACHINE AND ANALYSIS OF THE RESULTING TEST DATA.