

SENSORS TECHNOLOGYII

CoChairs: Mr. Henry R. Hegner, ManTech Advanced Technology Systems Int'l, Bethesda, MD and Mr. Christopher P. Nemarich, GEO-Centers, Inc., Lanham, MD

1:30 *Micromachined Ceramic Pressure Sensors for High Temperature Environments:* J. M. ENGLISH and M. G. ALLEN, Georgia Institute of Technology, Atlanta, GA

1:50 *Holographic Instrument for Residual Stress Measurement:* G. SALAMO, G. DOVGALENKO, Y. ONISCHENKO and A. KNIAZKOV, University of Arkansas, Fayetteville, AR

2:10 *Smart Bearing for Railcar Wheelset Monitoring:* J. N. SCHOESS, Honeywell Technology Center, Minneapolis MN

2:30 *An Intelligent Tool Condition Monitoring System:* P. FU, A. D. HOPE and G. A. KING, Southampton Institute, U.K.

2:50 **BREAK**

3:10 *Survey of Emerging Sensor Technologies for Machinery Diagnostics:* H. R. HEGNER, ManTech Advanced Systems, International, Bethesda, MD and C. P. NEMARICH, GEO-Centers, Inc., Lanham, MD

3:30 **Panel Discussion: Identifying Sensor Development Needs for Automated Machinery Diagnostics**

The panel presentations are expected to cover different industry perspectives on automated diagnostic requirements. Where are the shortfalls in automated on-line diagnostic sensor systems, e.g., oil debris analysis, IR thermography or other techniques? Most systems require a human operator or there are other complications that inhibit the use of automated systems. If so, what are they? What development efforts would different industries like to see? There are questions from the sensor developer's viewpoint. Is it worth the R & D investment? What is the market? What prices are acceptable for new sensors? More details about the issues to be discussed will be provided at the conference. Panel members will also be identified at that time.

HEALTH MONITORING AND RELIABILITY OF ELECTRONICS

Chair: Mr. Norman Mottram, QualMark Corporation, Denver, CO

1:30 *Development and Implementation of a Health Monitoring System for Critical Electronic Systems,* M. E. NATISHAN, University of Maryland, College Park, MD

1:50 *Implication of "Cannot Duplicate" Failure in Microelectronics:* M. DUBE, University of Maryland, College Park, MD

2:10 *Overview of Accelerated Ruggedisation Techniques for Microelectronic Assemblies Currently in Use in Commercial Industry:* N. MOTTRAM, QualMark Corporation., Denver, CO

2:30 *Case Study of Failures and Failure Modes Uncovered Utilizing Accelerated Ruggedisation Techniques:* S. CAMPBELL, ARTC, QualMark Corporation, Morrisville, NC

2:50 **BREAK**

3:10 **Panel Discussion: Issues in Electronics Reliability**

Moderator: Dr. Carlos M. Talbott, Talbott & Associates, West Chicago, IL

The electronics industry is relatively new when compared to the mechanical machinery systems industry yet the rapid growth of this industry has made electronics reliability a major concern. Very few machines are solely mechanical. Most now rely heavily on microelectronics for control. Electronics and microelectronics now comprise a very important part of everything we use; consequences of failure of these systems are increasingly severe. Knowledge of failure modes and mechanisms and how to diagnose and predict the condition of these systems lags behind that of mechanical systems. Some reasons for this will be discussed in the session. In an age where use of electronics in control of critical systems is increasing at a rapid rate it is imperative that we push for standardization of performance reliability across the industry. We must share information on failure modes and mechanisms so that design of reliable health monitoring methods for electronics systems is possible.