

Airworthiness, CO D and HUMS Specialists' Meeting 2011

**Huntsville, Alabama, USA
7-9 February 2011**

ISBN: 978-1-62748-697-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2011) by the American Helicopter Society International
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the American Helicopter Society International
at the address below.

American Helicopter Society International
217 N. Washington Street
Alexandria, VA 22314-2538

Phone (703) 684-6777

Fax: (703) 739-9279

staff@vtol.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SESSION I - AIRWORTHINESS STANDARDS

Session Chair: Jamie Allen

AERONAUTICAL DESIGN STANDARD 79-B HANDBOOK FOR CONDITION BASED MAINTENANCE ON US ARMY AIRCRAFT	1
<i>William Lewis, Gail Cruce, Jane Parkins</i>	
INTEGRATION OF CONDITION BASED MAINTENANCE INTO ARMY AVIATION	N/A
<i>Chris Smith</i>	
APPLICATION OF AERONAUTICAL DESIGN SPECIFICATION 79A TO THE UH-60L ACCESSORY GEARBOX GENERATOR DRIVE BEARINGS	13
<i>Daniel Wade, Jeremy Branning</i>	

SESSION II - HUMS IN OPERATION

Session Chair: Dennis Dunaway

RIMFIRE™ - A FAILURE REPORTING AND CORRECTIVE ACTION MONITORING SYSTEM FOR US ARMY AVIATION	23
<i>Dean Hutson</i>	
UH-60 BLACKHAWK TAIL ROTOR CBM CAPABILITIES	43
<i>Sam Kunselman, Don Estes, Rena Fish, Matt Blackwood, Todd Anderson</i>	
TAIL ROTOR BLADE ANGLE VARIATION AND ITS EFFECT ON TAIL ROTOR VIBRATION	55
<i>Ron Bednarczyk, Richard McCann, Jeremy Branning</i>	
FLIGHT VISUALIZATION USING HUMS DATA	71
<i>Amit Singh, Mohit Iyyer, Nam Phan</i>	
EVALUATION OF OIL ANALYSIS METHODS FOR CONDITION-BASED MAINTENANCE OF AH-64 HELICOPTER COMPONENTS	N/A
<i>Praveen Noolia, Nicholas Goodman, Abdel Bayoumia, Jose A Sanchez, James Baker</i>	

SESSION III - ALGORITHMS FOR SUSTAINED AIRWORTHINESS

Session Chairs: Ken Knopp and Traci Stadtmueller

PREDICTING FAULTS AND DETERMINING LIFE OF ELECTRO-MECHANICAL ACTUATION (EMA) SYSTEM FOR ENGINE AND AEROSPACE APPLICATIONS	81
<i>Christopher Cooper, Leah Roach, Nick Frankle</i>	
USE OF FLEET DATA AND SEEDED FAULT TESTING TO ENHANCE DIAGNOSTIC OPERATIONS AND PROVIDE THE BASIS FOR SAFE PROGNOSTICS OF A HELICOPTER BEARING	87
<i>Romano Patrick, Matthew J. Smith, Carl S. Byington, Daniel R. Wade, George J. Vachtsevanos</i>	
ENHANCING AIRWORTHINESS THROUGH DYNAMIC SYSTEM RELIABILITY MODELING FOR COMPLEX MILITARY AIRCRAFT SYSTEMS	110
<i>Daniel P. Schrage, Vitali Volovoi</i>	
ON THE FATIGUE LIFE RELIABILITY ASSOCIATED WITH VARYING DEGREES OF STRUCTURAL USAGE MONITORING	119
<i>Lewis Zion, Michael Chandler</i>	
QUANTIFICATION OF CONDITION INDICATOR PERFORMANCE ON A SPLIT TORQUE GEARBOX USING AN ADVANCED SIGNAL PROCESSING TECHNIQUE	135
<i>Praneet Menon, David He</i>	

SESSION IV - INTEGRATION OF HUMS SYSTEMS

Session Chair: Gail Cruce

THE CERTIFICATION OF A CBM TEST BED FOR PLAYBACK OF RECORDED AIRCRAFT HUMS DATA	139
<i>Dennis Dunaway, Jane Parkins, Gail Cruce</i>	
EXPERIMENTAL EVALUATION OF ACOUSTIC EMISSION MONITORING FOR CONDITION-BASED MAINTENANCE OF HELICOPTERS	146
<i>Vytautas Blechertas, Nicholas Goodman, Abdel Bayoumi</i>	

SEEDED FAULT TESTING LESSONS LEARNED FOR CONDITION BASED MAINTENANCE SYSTEMS ON US ARMY AIRCRAFT	154
<i>Harold T. Hardee, Gail E. Cruce</i>	
INTEGRATION OF REMOTE SENSING AND PROBABILISTIC FRACTURE ANALYSIS FOR AIRFRAME STRUCTURAL INTEGRITY ASSESSMENT	N/A
<i>Dale Cope</i>	
REMEDICATION OF APACHE MIXER COMPONENTS: LOADS, DMWR, AND MORE ACCURATE LIFE	N/A
<i>Joshua Williams, Jeff Finckenor</i>	

SESSION V - HUMS INSTRUMENTATION AND SENSORS

Session Chair: John Lassiter

FLIGHT TESTING OF A WIRELESS SENSING SYSTEM FOR ROTORCRAFT CBM	N/A
<i>S.W. Arms, C.P. Townsend, J.H. Galbreath, Dan Liebschutz, Nam Phan, Allen Jones, Treven Baker</i>	
DEVELOPMENT OF A MULTI-PLATFORM DIGITAL SOURCE COLLECTOR TEST FACILITY	161
<i>Douglas H. Barclay II, Casey Carter, Scott J. Demmis</i>	
AN EXPERT SYSTEM FOR ROTOR TRACK AND BALANCE	171
<i>Eric Bechhoefer, Austin Fang, Dan Hiatt, Daniel Van Ness</i>	
AN INTEGRATED VEHICLE HEALTH MANAGEMENT SYSTEM FOR NEXT GENERATION CBM	180
<i>Michael Schoeller, Jeffery Hoffman, Michael Roemer, Jason Fetty, Treven Baker</i>	
NEXT GENERATION DATA ACQUISITION TECHNOLOGIES FOR AGING AIRCRAFT	203
<i>Stephen Willis</i>	
WEIGHT OPTIMIZATION USING LIGHTWEIGHT DATA ACQUISITION NODES	208
<i>Lesley Brealey, David Buckley, Sinbad Wilmot</i>	
Author Index	