

**MECHANICAL ENGINEERING DEPARTMENT
UNIVERSITY OF UTAH**

Resume 02-11-10

NAME David W. Hoepfner, Ph.D., P.E.

TITLE Professor, Department of Mechanical Engineering,
University of Utah, Salt Lake City, Utah. 1985-Current.
Director, Quality and Integrity Design Engineering Center
(QIDEC)-1985-Current.
Formerly-Chair of Department of Mechanical Engineering
(May 1985-Sept.1992), University of Utah.

BIRTHDATE December 17, 1935

EDUCATION Bachelor of Mechanical Engineering, Marquette University,
1958
Master of Science in Metallurgical Engineering, University of
Wisconsin, 1960.
Doctor of Philosophy, University of Wisconsin, 1963
(Concentration areas of study-Materials Engineering,
Applied Mechanics, Fatigue and Fracture Mechanics,
Statistics and Probabilities, Thesis in area of Fatigue
Behavior).

**MEMBERSHIPS/
VOLUNTEER WORK** American Society of Mechanical Engineers (000531822)
American Institute of Aeronautics and Astronautics (M397-
5703), Associate Fellow
American Society for Metals (010500)
American Society for Testing and Materials (H63307000)
National Society of Professional Engineers (102816072)
Sigma Xi-Honorary Research Fraternity, Univ. of Utah
Chapter (63024015)
University of Utah Campus Christian Center, Executive
Board
Instructor – Church School Class, Christ United Methodist
Church for over 22 years.
Numerous officer positions in Methodist Church including
board, treasurer, and trustee.
Eagle Scout-BSA, 1953.
Lodge Chief-Order of the Arrow, Honorary BSA organization.
1953-55.
Extremely active in U.S. Jaycees from 1964-1974. Jaycee
president-Santa Paula, CA chapter, 1970/71, District
Governor, made a Jaycee International Senator
(International honorary group for Jaycees) for life-1973.

Santa Paula, CA planning council-1971-74, appointed by Mayor of Santa Paula, CA.

HONORS AND AWARDS:Waukesha High School Senior Class Treasurer-1952-53.
Eagle Scout, Boy Scouts of America-1953.
Lodge Chief-Order of the Arrow-Boy Scout Honorary Society-1952-53.
Ladish Company Scholar-1955-58; scholarship awarded for undergraduate studies in Mechanical Engineering.
Ford Foundation Fellowship-1960-63; awarded to allow pursuit of Ph.D. degree.
Wisconsin Alumnae Association Research Fellowship-1959-63; awarded to allow pursuit of M.S. and Ph.D. degree.
Listed in American Men of Science
Listed in Who's Who in Science and Engineering
Listed in Outstanding Young Men of America
Listed in Outstanding Educators of America
AIAA Associate Fellow
AIAA Distinguished lecturer, 1982-83.
Selected as a U.S. Jaycees International Senator-1973-Current.
Nominated as U. of Utah Research Professor-3 times.
Nominated as Utah Engineering Educator of the Year by Utah AIAA Chapter, 1991/92.
Nominated as U. of Utah Distinguished Professor, 1992, 2003.
Nominated as the Utah Engineering Educator of the year by the AIAA-1991.
Nominated as the Utah Engineer of the year by the ASME-1997.
AIAA Distinguished Lecturer (1987-88).
Top 10% of UCLA Short Course Lecturers for several years (from over 300 instructors from industry, government, and academia)
Selected as the outstanding Mechanical Engineering Professor in Teaching-1989.
Nominated for outstanding Engineering Teacher for 1992/93 and 1999/2000 by Mechanical Engineering Dept.-2000.
Nominated for J. Crichlow award of AIAA twice (1996 and 2003).
Held the Endowed Cockburn Professorship of Engineering Design-U. of Toronto; 1978-84; Held the Distinguished Endowed Cockburn Professorship-University of Toronto, 1985.
RECIPIENT OF THE 2005 UTAH GOVERNOR'S MEDAL FOR Outstanding Contributions to Science and Technology. 3d 4

Order of the engineer-May 13, 2006.

Inducted to the Waukesha (Wisconsin) High School WALL of FAME, Sept. 29, 2006.

Strathmore's Who's Who-Worldwide Edition-Strathmore's Who's Who. **Professional of the Year. Higher education-ME-2007.**

Strathmore's Who's Who-Worldwide Edition-2008.

Madison's Who's Who-Executive and Professional Registry-Lifetime member, 2007.

Kipling's Who's Who in Leading Business Professionals, Global Register, Life member, 2007.

Premier Who's Who, Premier Edition, 2007.

Strathmore's Who's Who-Worldwide Executive and Professional Registry-Professional of the Year-2008-Higher Education.

Strathmore's Who's Who, Worldwide Honors, Professional of the Year-2009, Higher Education/Mechanical Engineering.

Global Directories Who's Who-Top Educator-Engineering Education-2009.

Premier Who's Who, Premier Edition, 2009/10-Lifetime selection as Professional of the year.

Strathmore's Who's Who-Worldwide Edition-Strathmore's Who's Who. **Engineering Educator of the Year. Higher education-ME-2010.**

LICENSES

Dr. Hoepfner is a registered Professional Engineer in 3 states (Wisconsin, Ohio, and Missouri, and the Province of Ontario).

SIGNIFICANT START UP- ACTIVITIES AT UNIVERSITIES AND TECHNICAL COMMUNITY

1) Started the Structural Integrity and Materials Sciences program within the College of Engineering at U. Missouri-Columbia in 1974. This was the **first** Structural Integrity Program started at a University in North American and as far as is known in the world. It had extensive involvement with MAE (Mechanical and Aerospace Engineering), Bioengineering, Nuclear Engineering, Chemical Engineering, and Civil Engineering at UM-C. This program continued the development of HOLISTIC structural integrity based design initiated at Lockheed Aircraft Corporation. It was funded by the State of Missouri, U.S. Navy, Lockheed Aircraft Corp., Cameron Iron Works, Rolls Royce Aeroengine Co., U.S. Army, the Electric Power Research Institute, U.S. Air Force and others.

2) Founded and obtained funding for the Structural Integrity, Fatigue, and Fracture Research Laboratories at U. of Toronto in 1979. Funding was provided from the Connaught Foundation and other U. of Toronto sources. Extensive funding also was provided by the Rolls Royce Aeroengine Division, Pratt and Whitney Canada, Ontario Hydro, the Natural Sciences and Engineering Research Council of Canada, and the NRC Institute for Aerospace Research. Extensive development of HOLISTIC structural integrity based design processes occurred during this period. Rolls Royce Aeroengine Division incorporated the practice in their critical parts plan during this period as well.

3) Started the Quality and Integrity Design Engineering Center at the U. of Utah in 1985. Funding was provided by the College of Engineering, the Utah State Centers of Excellence Program, Rolls Royce Aeroengine Division, FASIDE International Inc., the Artificial Heart Laboratory and National Institutes of Health, Boeing Commercial Aircraft Company, Lockheed Corp., and the U.S. Federal Aviation Agency. Extensive development of HOLSIP (holistic structural integrity based design processes) occurred during this period.

4) In 2000 a small group of persons working on HOLISTIC structural integrity processes (HOLSIP) decided to initiate a series of workshops. Dr. Hoepfner was asked to chair the first workshop on this emerging field. It was held in Park City, UT during March, 2002. Eight workshops have now been held and the ninth one will be held in 2010. Dr. Hoepfner has served on the planning committee of all workshops held to date.

5) During the last 20 years or so numerous companies and government bodies have introduced HOLSIP into their design, research and technology development activities, strategic planning, aircraft (airframe and engines), fleet management activities, and mission readiness activities. Dr. Hoepfner has served as a consultant to many of these activities. The UK MOD (Ministry of Defense) through the RAF and RN have introduced these concepts to fleet management. They use an acronym ESVRE (Establish, Sustain, Validate, Recover, and Exploit) for managing their fleets based on HOLSIP. In addition, the Canadian DND (Department of National Defense), and NRCC (National Research Council of Canada) are using HOLSIP in all of their structural integrity design practices and strategic planning for research and technology development. The US FAA has begun adapting to this approach. In addition, the

Australian DSTO and RAAF (Royal Australian Air Force) have adopted HOLSIP as a part of their activities and plan for more use in the near future. ALCOA Corp. is the most advanced in using HOLSIP activities in many areas of their business and, like Rolls Royce Aeroengine Division have provided much support for its development over many years. JAXA (formerly the National Aerospace Laboratory of Japan) and the Japanese equivalent of OSHA have both adopted the design philosophy. Both sent a Post Doc./Researcher to spend one year with Dr. Hoepfner recently to master more of the fundamentals of this approach.

6) During the period 1979-87 Dr. Hoepfner was the chair of the TURBISTAN working group. This all European Group, except for Dr. Hoepfner, was successful in developing standard load sequences for critical rotating discs in gas turbines. The funding for Dr. Hoepfner's activities during this extensive involvement was provided by the Cockburn Centre Endowment at U. of Toronto, the Rolls Royce Aeroengine Division of Derby, England, and the NRCC. More detail on it is found below.

7) Dr. Hoepfner has given many keynote lectures and papers at important national and international meetings and details are provided below.

8) Dr. Hoepfner served as a member of the planning committee for the First International Symposium on Corrosion Fatigue held at the University of Connecticut in June, 1971. He gave the lead keynote paper at this meeting by request of the chairs of the symposium. The details are in the publications list below.

9) D. Hoepfner was chair, with Professor Uhlig of MIT, of the session on Fretting Fatigue of the First International Symposium on Corrosion Fatigue in 1971 cited above in item 8. Dr. Hoepfner has continued efforts in fretting fatigue for fifty years. This is one of the key elements of HOLSIP. Dr. Hoepfner gave the keynote-invited lecture at the first International Symposium on Fretting Fatigue held at the U. of Sheffield in Sheffield, England in 1993. He has presented invited keynote lectures at all of these symposia. He is currently serving on the planning committee for the sixth international Symposium on Fretting Fatigue to be held in Chengdu, China in 2010. He has been asked to present the invited keynote opening paper at this symposium and the Chinese government is providing partial support for his trip. Details on papers related to these meetings are provided below.

PREVIOUS EXPERIENCE

Endowed Cockburn Professor of Engineering Design and Director-

Structural Integrity, Fatigue, and Fracture Research Laboratory, Department of Mechanical Engineering, Professor of Mechanical Engineering.

Director of the Cockburn Centre of Engineering Design, University of Toronto, 1978-1985, tenured position with endowment.

Professor, Department of Mechanical, Aerospace, Nuclear and Bioengineering, and Director of Structural Integrity and Materials Science Program, University of Missouri-Columbia (UM-C), 1974-1978 (tenured position).

Group Leader, Fatigue and Fracture Laboratory, Lockheed California Company, 1969-1974.

Research Metallurgist/Engineer, Mechanical Engineering, Battelle Memorial Institute, Columbus Laboratories, 1964-1969.

Assistant Professor, University of Wisconsin, 1963-1964.

Assistant Professor, California State University, Northridge, 1963.

Ford Foundation Fellow and Instructor, University of Wisconsin, 1959-1963. Wisconsin Alumnae Research Foundation (WARF) Research Assistant. Teaching assistant.

Instructor and Lecturer in Applied Mechanics, College of Engineering, Marquette University, 1958-1959.

Plant Engineer-Waukesha Foundry Company-Summer, 1958.

Scholarship student and Engineer in training, Ladish Company, 1955-1958.

COMMITTEES, BOARDS

Committee member-Sixth International Symposium on Fretting Fatigue, to be held in China on 2010.

Committee member-ASTM committee on Fretting Fatigue and a member of the committee developing ASTM's standard on fretting fatigue. This standard is now being voted on within ASTM membership.

Committee member-Fifth International Symposium of Fretting Fatigue, to be held in Montreal, Canada, held in May 2007.

Member of the planning committee of the ninth HOLSIP workshop to be held at Snowbird, UT Feb. 28-March 4, 2010.

Member of the planning committee of the 8th HOLSIP workshop to be held at the Canyons resort in March, 2009.

Member of the Planning Committee of the 6th and 7th HOLSIP workshops held in Big White, B.C., CAN and Big Sky, MT in 2007 and 2008 respectively.

Chair, fifth international workshop on HOLISITIC Structural Integrity Processes, held at Park City, UT, Feb. 26-March 4, 2006.

Member, Planning Committee for the second, third and fourth International Workshop on HOLISTIC Structural Integrity Processes held respectively in Fernie, British Columbia, Canada (2003), Breckenridge, CO (2004), and Stowe, VT(2005).

Chair, first international workshop on HOLISITIC Structural Integrity Processes, held at Park City, UT.

Committee member Fourth International Symposium on Fretting Fatigue, to be held in Lyon, France, 2004.

Committee member, Third International Symposium on Fretting Fatigue, held in Nagoaka, Japan, May, 2001.

Member of Handbook Committee and Writer of two Sections, ASM handbook on Fatigue, volume 19, ASM, Metals Park, Ohio, 1997.

Chair-Second International Symposium on Fretting Fatigue held at the U. of Utah, September, 1998. **Co-Editor**, "Fretting Fatigue: Current Technology and Practices", ASTM STP 1367, ASTM, West Conshohocken, PA, 2000.

Former Chair, TURBISTAN Committee. Turbistan involves the following European companies and agencies: 1) Rolls Royce, 2) SNECMA, 3) MTU, 4) University of Aachen, 5) LBF, (Germany), 6) IABG, 7) NLR of the Netherlands, 8) CEAT-France, 9) RAE - England. (1980-1986).

Elected to a three year term as Chair of ASME Region XII Mechanical Engineering Department Heads, ASME MEDH meeting, Orlando, Florida, March 7-12, 1989-1992

Committee Member for ASM International Conference on Fracture, Fatigue, Failure Analysis, and Corrosion, held in Salt Lake City, Utah, December, 1985.

Member of Editorial Board of the International Journal of Fatigue, 1978-2003.

Chair-Mechanical Engineering Design Search Committee, 2001-2.

Member-ME Scholarship Committee, 1999-2001.

Academic Senate-University of Utah, 1997-2001.

Graduate Council-University of Utah, 1990-1992. (Chair Protemp).

Chair- Department of Mechanical Engineering Retention, Promotion, and Tenure Committee, 1992-1994.

Chair- College of Engineering Retention, Promotion, and Tenure Committee, 1993-1994.

Served on many academic committees at both the U. of M-Columbia, and the U. of Toronto while on the faculty there.

Committee on Rolls Royce Disk Burst Investigations Team (L1011; 1972-1980).

U.S. Navy Task Force on Titanium Hull Submarines, 1970-1976.

Working Group Member of AFOSR on Structural Integrity and Damage Tolerance-1992-5.

Member of the executive committee, ASTM Committee E 09 on Fatigue. 1972-80.

Chair - ASTM Committee on Fatigue Testing and Apparatus, 1970-1978.

Chair - ASTM Committee E 9, Task Force on Environmental Effects on Fatigue, 1968-1972.

Secretary-ASTM Committee E 9, Committee on Fatigue Research, 1968-75.

Courses taught over past ten years:

1. **ME EN 4050.** Concurrent engineering II. 2 credits. (Failure and Reliability Considerations in Design or Practical Reliability Engineering for Mechanical Engineers). Usually taught in spring term.
2. **ME EN 6500-5500.** Engineering Elasticity. 3 credits. Usually taught in alternate years in the fall term.
3. **ME EN 7060.** Fatigue and Creep Considerations in Engineering Design. 3 credits. Taught in alternate years in the fall term from 1986-2002. Now taught in alternate years in the fall term.
4. **ME EN 7070.** Tribology and Corrosion Considerations in Engineering Design. 3 Credits. Taught in alternate years in the spring term from 1986-2003. Now taught in alternate years in the fall term.
5. **ME EN 7530.** Engineering Fracture Mechanics. 3 Credits. Taught in alternate years in spring term until 2004.
6. **ME EN 5040/6040.** Quality Assurance Engineering - "Quality Control". 3 Credits. Taught in alternate years in spring term.
7. **ME EN 7960.** Special Topics in Mechanical Engineering-Fatigue crack propagation. 3 Credits. Taught in spring of 2002.
8. **ME EN 5960/6960-Special Topics in Mechanical Engineering-Engineering Ethics.** 3 Credits. Taught on numerous occasions over the past 28 years.
9. **ME EN 2400 Dynamics.** 4 Credits. Taught in spring term 1996. Also taught on many occasions over the years.
10. **ME EN 3300 Strength of Materials.** 4 Credits. Taught numerous times from 1985-1995. Also taught at other universities on many occasions.
11. **ME EN 5300 Advanced Strength of Materials.** 3 Credits. Taught numerous times from 1985-1998 and taught many times at other universities.
12. **ME EN 7500 Engineering Material Science.** 3 Credits. Taught in 1998 and numerous times from 1985-98.
13. **ME EN 5960 Special Topics in Mechanical Engineering.** Taught Engineering Ethics as an elective three times from 1988-1998.
14. **ME EN 6975 Research and Thesis: Master of Science.** Supervise students as needed virtually every term over past five years.
15. **ME EN 6955 Master of Engineering Project.** 1 to 4 Credits. Supervise students as needed. Currently supervising one student during summer of 2003.
16. **ME EN 7970 Ph.D. Dissertation.** 1 to 12 Credits. Supervise students, as needed virtually every term over past 25 years.
17. **ME EN 7980 Faculty Consultation: Doctoral.** 3 Credits. Supervise students as needed. (I have now supervised the completion of 29 Ph.D. degrees at the UU and 44 overall. Now supervising five Ph.D. students.)

In addition to the courses listed above I have taught many other ME EN classes at UU and other universities. Included in this list would be the following: Thermodynamics, Fluid Mechanics, Finite Element Analysis, Statics for Engineers, Mechanical Behavior of Solids, Mechanical Component Design, Introduction to Engineering Design, and many design projects for undergraduate students with emphasis on senior projects. While at the University of Toronto I directed over 150 undergraduate senior projects and senior theses as a part of my mechanical engineering department duties as well as those associated with the Directorship of the Cockburn Centre of Engineering Design.

PREVIOUS AND CURRENT GRADUATE STUDENTS SUPERVISED BY DAVID W. HOEPPNER, P.E., PH.D.

| DATE | TITLE | STUDENT | DEGREE/UNIV. |
|-------------|---|-----------------------|---------------------------------------|
| 1974 | NDT Study of Aluminum P.M. Properties | L.W. Lucas | M.S. Project, U. of Missouri-Columbia |
| 1974 | Fretting Fatigue of Metals | Roger Reeve | M.S., U. of Missouri-Columbia |
| 1975 | The Effect of Microstructure on the Fatigue Properties of A .40/.50 Carbon Steel | Jerry Alan Wear | M.S., U of Missouri-Columbia |
| 1975 | The Effects of Microstructure on the Fatigue Life of Titanium | Dale A. Wilson | M.S., U. of Missouri-Columbia |
| 1975 | The Design Analysis of Wooden Writing Instrument Pocket Clips | Lawrence Lubbert, Jr. | M.S. Project, U. of Missouri-Columbia |
| 1975 | Sustained Load Crack Growth in A553B-1 Steel under Neutron Irradiation in a Water Environment | M.C. Gupta | M.S., U. of Missouri-Columbia |
| 1976 | The Effect of a Frequent-Environment Synergism on the Fatigue-Crack Growth of SA533B-1: A Nuclear Pressure Vessel Steel | John Panhuse, III | M.S., U of Missouri-Columbia |
| 1976 | Influence of Microstructural and Load Wave Form Control on Fatigue Crack Growth Behavior of Precipitation Hardening Stainless Steel | Kevin R. Kondas | Ph.D., U of Missouri-Columbia |
| 1976 | The Effect of Environment and Frequency on the Fatigue Behavior of Welded Pressure Vessel Steel | Cheung Poon | M.S., U. of Missouri-Columbia |

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| 1976 | The Residual Fatigue Life of 1020 Steel and 7075-T6 Aluminum as a Function of Initial Flaw Size | Vidyut P. Shah | M.S., U of Missouri-Columbia |
| 1976 | The Effect of Crystallographic Orientation on Fatigue and Fretting of Copper Single Crystals | Gary C. Salivar | M.S., U of Missouri-Columbia |
| 1976 | The Effect of Mean Stress and R Ratio on the Fatigue Behavior of Turbine Alloys | Sharon L. Cole | M.S., U of Missouri-Columbia |
| 1977 | The Effect of Frequency, Environment, and R Ratio on the Fatigue-Crack Growth of a Nuclear Pressure Vessel Steel | Art Braun | M.S., U of Missouri-Columbia |
| 1977 | Effect of Surface Roughness on Fretting Fatigue Behavior of 7475-T61 Aluminum | Ray Jordan | M.S., U of Missouri-Columbia |
| 1977 | Microstructural and Environmental Effects on Fretting Fatigue | Roger K. Reeves | Ph.D., U of Missouri-Columbia |
| 1977 | The Evaluation of Fatigue Crack Growth in a Nuclear Pressure Vessel Steel | Andrew Tsai | Ph.D. U. of Missouri-Columbia |
| 1977 | The Effect of Hardness and Different Materials on the Fretting Fatigue Behavior of Ti-6Al-4V | William K. Watts, Jr. | M.S., U of Missouri-Columbia |
| 1977 | "Water Chemistry Control and Operation of Simulated Operation of Simulated Reactor Environment for Fatigue Crack Growth Behavior Studies of Nuclear Pressure Vessels Steel | John Hoeller | M.S., U. of Missouri-Columbia |
| 1978 | A Statistically Based Investigation of Microstructural Effects on the Fatigue Properties of Titanium and Titanium Alloys | Dale A. Wilson | Ph.D., U of Missouri-Columbia |
| 1978 | The Statistical Analysis and Presentation of Fatigue-Crack Growth Rate Data | Larry M. Mueller | M.S., U of Missouri-Columbia |

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| 1978 | Corrosion Assisted Fatigue in 2024-T851 Aluminum Alloy | Michael E. Mayfield | M.S., U of Missouri-Columbia |
| 1978 | Fatigue and Fretting Fatigue of Polycrystalline Copper | Eugene R. Nickel | M.S., U of Missouri-Columbia |
| 1978 | Environmental Effects on the Mechanism of Fretting Fatigue in 7075-T6 Aluminum | Cheung J. Poon | Ph.D., U of Missouri-Columbia |
| 1979 | Characterization of Metal Damage Through Infrared Technology | Sharon L. Langenbeck | Ph.D., U of Missouri-Columbia |
| 1979 | Pitting and Fatigue Crack Initiation of 2124-T851 Aluminum in 3.5% NaCl Solution | James M. Cox | M.S., U of Missouri-Columbia |
| 1979 | A Statistically Based Analysis of the Effects of Frequency and Environment on the Fatigue Characteristics of SA 533B-1 Steel | Gary Salivar | Ph.D., U. of Missouri-Columbia |
| 1979 | Fretting Fatigue Stress Simulation | Jung S. Chung | M.S., U of Missouri-Columbia |
| 1982 | A Statistical Approach to Miner's Rule | D. A. Hull | M.E., U of Toronto |
| 1982 | A New Apparatus for Studying Fretting Wear | David Kusner | M.A.Sc., U of Toronto |
| 1982 | The Design and Development of an Experimental Apparatus for Fracture Mechanics Based Fretting Fatigue Studies with Electro hydraulic Closed Loop Servo-Control of Axial Load, Normal Load and Slip Amplitude | Doug S. Mann | M.A.Sc., U of Toronto |
| 1983 | An Investigation into the Effects of Welding-Induced Residual Stresses and Microstructural Alterations on the Fatigue Crack Growth Behavior of Commercial Purity Titanium | D. C. Wu | M.A.Sc., U of Toronto |

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| 1983 | The Thermodynamic Aspects of Fracture and a Mathematical Method to Analyze Plane Elasto-Plastic Systems | Fred L. Gates | Ph.D., U of Toronto |
| 1983 | An Investigation into the Fatigue/Creep Crack Growth Characteristics of 2.25 Cr-1Mo Steel | Patrick Sooley | M.A.Sc., U. of Toronto |
| 1983 | Real-Time SEM Observation of Fatigue-Induced Slip in Polycrystalline Copper and Alpha-Brass | F. M. Smith | B.A.Sc., U of Toronto |
| 1983 | Corrosion Fatigue of 7075-T76 Aluminium 1 1/2 Dogbone Specimens | A. R. MacDonald | M.A.Sc., U of Toronto |
| 1983 | Corrosion Fatigue Behaviour of Ti-6Al-4V in Simulated Body Environments | Marko Yanishevsky | M.A.Sc., U of Toronto |
| 1983 | A Statistically Based Investigation into the Effect of Grain Flow Orientation on the Fretting Fatigue Characteristics of Forged AMS6415 Steel | C. K. W. Yeung | M.A.Sc., U of Toronto |
| 1983 | A New Apparatus for Making In-Situ Observations of the Fatigue Process in Metals | Sandro Missana | M.A.Sc., U of Toronto |
| 1984 | The Development of an Automated Crack Growth Threshold Test System to Characterize IMI 685 | G. C. Smith | M.A.Sc., U of Toronto |
| 1984 | The Effect of Extrinsic Load Parameters on the Elevated Temperature Fatigue of Life of Engineering Metals | F. P. Dean | M.E., U of Toronto |
| 1984 | Perspectives and Insights on the Cyclic Load Response of Metals | David W. Cameron | Ph.D., U of Toronto |
| 1984 | An Investigation into Test Frequency Effects on the Corrosion Fatigue Crack Growth Threshold of 7075-T6 Aluminum Alloy Using a Personal Computer Based Automated System | Elizabeth C. L. Mann | M.A.Sc., U of Toronto |
| 1984 | Determination of Stress Intensity Factors for Three Dimensional Crack Problems with Differential Stiffness Method | Z. Song | M.A.Sc., U of Toronto |
| 1984 | Using Lamination to Enhance Rotating Disc Damage Tolerance | W. J. Unger | M.A.Sc., U of Toronto |
| 1985 | An Investigation of the Fatigue Crack Growth Rate Characteristics of Titanium Alloy IMI829 | Patrick M. Sooley | Ph.D., U of Toronto |

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| 1985 | Computer Assisted Corrosion Fatigue Crack Growth Rate Testing Under Spectrum Loading | G. F. Ziebenhaus | M.A.Sc., U of Toronto |
| 1986 | Study of the Effects of Dwell Time on the Fatigue Crack Propagation Rate in Ti-6Al-4V Alloy | P. Beaudet | M.A.Sc., U of Toronto |
| 1986 | An Investigation into the Fatigue Crack Growth Characteristics of a Single Crystal Nickel-Base Superalloy | D. C. Wu | Ph.D., U of Toronto |
| 1986 | An Experimental Investigation of the Behaviour of Ti-6Al-2Sn-4Zr 2Mo Subjected to Biaxial Fatigue at an Elevated Temperature | W. G. Hellier | M.A.Sc., U of Toronto |
| 1987 | Improvements to an In-Situ Fatigue Apparatus Capable of Generating Qualitative and Quantitative Information Regarding the Fatigue Process in Metals | R. R. Stephens | M.S., U of Utah |
| 1988 | Fatigue Crack Growth in Ti-6Al-4V Subjected to the Turbistan Loading Sequence | D. Salmon | M.S., U of Utah |
| 1988 | The Effects of Dwell Time on Material Behavior in Titanium Alloy IMI 829. | Z. Song | Ph.D., U of Utah |
| 1988 | Crack Propagation Thermodynamics | J. S. Short | Ph.D., U of Utah |
| 1988 | Quantitative Representation of Microstructural Contributions to Fatigue Crack Growth | F. M. Smith | Ph.D., U of Utah |
| 1988 | The Design and Fabrication of a Spin Testing Facility | D. E. Gerbec | M.S., U of Utah |
| 1989 | An Investigation into the Fatigue Crack Growth Behaviour of an IMI 829 Titanium Rotating Disc Material | D. A. Hull | Ph.D., U of Toronto |
| 1990 | Fractographic Analysis and Microstructural Investigation of a Cast Nickel-Base Superalloy (MAR M247) Tested Under Fatigue and Creep Loading Conditions | J. Yan | M.S., U of Utah |
| 1990 | Fractographic Analysis of Two High Performance Alloys Designed for Use in Aircraft Gas Turbine Engines | A. D. Paulson | M.S., U of Utah |

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| 1990 | The Effect of Microstructure on Fatigue Crack Growth Behavior in Nodular Cast Irons | M. Xia | M.S., U of Utah |
| 1990 | Failure Analysis of Front Wheel Hubs Used in Heavy Duty Trucks | L. Ma | M.S., U of Utah |
| 1990 | Fretting-Fatigue Study of 2090-T8E50 Alloy Sheets After Artificial Aging | X. Yao | M.S., U of Utah |
| 1990 | Surface Integrity and Fatigue Effects on In Vitro Degradation of Biomer | M. Sinnott | M.S., U of Utah |
| 1991 | Permeability of Heart Diaphragms | J. Pauley | M.S., U of Utah |
| 1991 | Accelerated Wear Development on the 27 Millimeter St. Jude Artificial Heart Valve in the Mitral Position for Use in an Artificial Heart | J. Juretich | M.S., U of Utah |
| 1991 | In-Situ Short Fatigue Crack Characterization of a Nickel-Base Superalloy at Ambient and Elevated Temperature | R. R. Stephens | Ph.D., U of Utah |
| 1991 | Investigations of the Fretting Fatigue Mechanisms on 7075-T6 Aluminum Alloy and Ti-6Al-4V Titanium Alloy | S. Adibnazari | Ph.D., U of Utah |
| 1991 | Uniaxial and Biaxial Stress Concentrations Due to Small, Flat Bottomed, Conical Indentations on the Surface of a Solid Cylindrical Bar | M. L. Thomsen | M.S., U of Utah |
| 1992 | Reliability of Bearings for Artificial Hearts | R. Fratto | M.S., U of Utah |
| 1992 | Fatigue Crack Propagation in Silicon Nitride | D. C. Salmon | Ph.D., U of Utah |
| 1992 | Effect of Anisotropic Behaviour Upon Fatigue Crack Propagation in Rotating Disk | D. E. Gerbec | Ph.D., U of Utah |
| 1992 | No Thesis | M. Moesser | M.S., U of Utah |
| 1992 | No Thesis | A. Sabbagh | M.S., U of Utah |

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| 1992 | Effects of Minor Loading Sequences on Aluminum Alloys | A. Paulson | Ph.D., U of Utah |
| 1993 | Evaluation of Graphite/Epoxy Laminate ARCS Subjected to Bending | K. Franklin | M.S., U of Utah |
| 1993 | Development of a Computer Controlled Compliance Based Fatigue Crack Growth Rate Data Acquisition System | D. D. Swartz | M.S., U of Utah |
| 1993 | Design Methodology | D. Macferran | Ph.D., U of Utah |
| 1993 | Aluminum Alloy Fretting in Air and a Vacuum | C. Elliott III | Ph.D., U of Utah |
| 1993 | | D. Culliton | M.S., U. of Utah |
| 1994 | Pitting Effects on the Corrosion Fatigue Life of 7075-T6 | L. Ma | Ph.D., U of Utah |
| 1994 | Finite Element Analysis of a Riveted Joint | S. Kinyon | M.S., U of Utah |
| 1994 | Strain Accumulation Behavior of Titanium Alloys | M. Thomsen | Ph.D., U of Utah |
| 1994 | The Role of Fretting on the Fatigue Behavior of Ti-6Al-4V Orthopaedic Implant Material | V. Chandrasekaran | M.S., U of Utah |
| 1994 | The Effects of Exfoliation Corrosion on the Fatigue Response of 7075-T651 Aluminum Alloy | T. Mills | M.S., U of Utah |
| 1995 | Effect of Anisotropy on Corrosion Fatigue | M. Blinn | Ph.D., U of Utah |
| 1995 | Corrosion Pitting Fatigue | L. Grimes | M.S., U of Utah |
| 1995 | Effect of Realistic Environments on Aircraft Structures | J. Kramer | M.S., U of Utah |
| 1995 | Temperature Effects on Corrosion Fatigue Crack Growth | D. Magda | Ph.D., U of Utah |

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| 1996 | Multiaxial Fatigue Behavior of Gas Turbine Materials | J. Yan | Ph.D., U of Utah |
| 1996 | Effect of Fretting Fatigue on Behavior of Riveted Aircraft Joints | M. Moesser | Ph.D., U of Utah |
| 1996 | Fatigue Behavior of Short Cracks as affected by Prior Corrosion Exposure. | A. Hoepfner | M.S., U of Utah |
| 1996 | The Effect of Frequency on the Fretting Fatigue Behavior of 7075-T651 Aluminum Alloy in Lab Air and Vacuum Environments | D. Culliton | Ph.D., U of Utah |
| 1996 | No Thesis | A. Shah | M.S., U. of Utah |
| 1997 | Effect of Exfoliation Corrosion on Fatigue Strength | T. Mills | Ph.D., U of Utah |
| 1997 | Effect of Realistic Chemical Environments on Fatigue Crack Growth | David Swartz | Ph.D., U of Utah |
| 1997 | Fretting Fatigue of IN100 | J. Ledesma | M.S., U of Utah |
| 1997 | Effects of Fretting Corrosion on the Fatigue Behavior of Modular Orthopaedic Implants | Chandrasekaran Venkatesan | Ph.D. U. of Utah |
| 1998 | Effect of Variable Amplitude Loading on Fretting Fatigue | S. Kinyon | Ph.D., U of Utah |
| 1998 | Fretting Fatigue | Paul Clark | M.S., U. of Utah |
| 2000 | Reliability of X-ray tubes | David Critchley | M.S., U. of Utah |
| 2000 | Summary of Fatigue and Quality Case Studies | Todd Van Orman | M.S., U. of Utah |
| 2000 | Effect of Corrosion and Prior Cold Work on Fatigue of Rivet Holes in Aircraft Joints | Yeung-In Yoon | Ph.D., U. of Utah |
| 2000 | Effect of Prior Corrosion on Cold Worked Holes Fatigue Behavior | Yeung-In Yoon | Ph.D., U. of Utah |

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| 2001 | Pitting Corrosion Fatigue | Paul Clark | Ph.D., U. Of Utah |
| 2002 | Fretting Fatigue | A. Shah | Ph.D., U of Utah |
| 2002 | Corrosion Fatigue-Pitting | Michael Risik | M.S., U. Of Utah |
| 2003 | A Single Cylinder Approach to In Situ Study of Fatigue Cracks | Larry Smiltneek | M.S., U. Of Utah |
| 2003 | Fracture Mechanics Based Methodology-co supervisor with Professor Larry Reaveley in Civil Engineering | Paul McMullin | Ph.D.-C.E., U. of Utah |
| 2003 | Failure Assessment of Landing Gears | Bryce Harris | M.S.-U. of Utah |
| 2004 | Effect of Microstructure on Pit-To-Crack Transition of 7075-T6 Aluminum Alloy | Kimberli Jones | Ph.D., U. of Utah |
| 2006 | Environmental Effects on Fatigue | Carlos Ariscoretta | M.S., U. of Utah |
| 2005 | Fretting Fatigue | Sachin Shinde | Ph.D., U. of Utah |
| 2004 | Fretting Fatigue | Fatih Oktem | M.S., U. of Utah |
| 2007 | Corrosion fatigue behavior of ship structures and materials-Royal Thai Navy Fellowship Student | Padungktat Kwannikom | M.S. U of Utah. |
| 2007 | Corrosion fatigue behavior of ship structures and materials- Royal Thai Navy Fellowship Student | Passakorn Duangmnan | M.S. U of Utah. |
| 2008 | No thesis | Bryce Jolly | M.S. U. of Utah |
| 2008 | Corrosion/Corrosion Fatigue of Landing Gear Steels | Bryan Terry | M.S. U. of Utah |
| 2008-2011 | Corrosion Fatigue and Fatigue Modeling | Carlos Ariscoretta | Ph.D. U. Of Utah |

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| 2009 | No thesis. | Azur Azapagic | M.S.-U. of Utah. |
| 2009 | No thesis. | Kimberli Rizo | M.S.-U. of Utah. |
| 2008-2011 | The Effect of Fatigue Cracks on Fastener Flexibility, Load Distribution and Fatigue Crack Growth. | Zachary Whitman | Ph.D. U. of Utah |
| 2011 | Likely topic in area of corrosion of gas pipelines. | Sergio Limon | Ph.D. U of Utah |
| 2009-2011 | Topic not currently defined but likely in area of fretting fatigue of implants. | Azur Azapagic | Ph.D., U. of Utah |
| 2012 | Topic not currently defined. | Bryce Jolly. | Ph.D., U. of Utah |
| 2009-2012 | The following students intend to enroll for a Ph.D. in fall of 2009-Mr. Bryce Jolly, Mr. Bryan Terry, and Mr. Robert Pilarczyk. | See note. | Ph.D. U. of Utah. |
| 2009-2011 | Fastener flexibility and its effect on fatigue crack propagation of Aircraft Joints. | Randolph Heller | M.S. U. of Utah |
| 2009-2011 | Failure Modes of Radar Dome Platforms | David Parker | M.S., U. of Utah |

Post Doctoral Associates Funded and Supervised

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|--------------|----------------------|--|
| 1974-75 | Dr. Glenn Bowie | U. of Missouri-Columbia |
| 1978-81 | Dr. Cheung Poon | University of Toronto |
| 1979 | Dr. Malcolm Bright | University of Toronto-QETE-Hull, Quebec, Canada |
| 1980 | Dr. Betty Barrow | University of Toronto-NASA Glenn Research Center |
| 1981-85 | Ms. Irina Sherman | University of Toronto |
| 1980-85 | Dr. Gabriel Ogandale | University of Toronto |
| 1987-90 | Dr. Zhening Song | University of Utah |
| 1989-92 | Dr. Robert Stephens | University of Utah |
| 1992-95 | Dr. Saeed Abidnazari | University of Utah |
| 1992-Current | Dr. Charles Elliott | University of Utah |
| 2000-2003 | Dr. Paul Clark | University of Utah |

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| 2004 | Dr. Kimberli Jones | University of Utah |
| 2005-06 | Dr. Sachin Shinde | University of Utah |
| 2007-08 | Dr. Kenta Yamigawa | University of Utah, Funded by Japanese Government |

Visiting Scholar -Mr. Takao Okada, NAL (now JAXA), Tokyo, JAPAN-2003-2004

Visiting Scholar-Pekka Hautala- U. of Helsinki, Finland, Fall 2005.

Visiting Scholar-Dr. Kenta Yamigawa, Occupational Health and Safety Center, Tokyo, JAPAN, 2007-8.

UNDERGRADUATE (B.S.) THESES SUPERVISED BY DAVID W. HOEPPNER

| DATE | TITLE | STUDENT | DEGREE/UNI V. |
|------|---|------------------------|--|
| 1979 | Design and Construction of a Hydraulic Power Supply | J.W. Elward, D.J. Read | 4 th Year Design Project, U. of Toronto |
| 1979 | Human Energy Storage with a Compressed Air Medium | A.R.B. Leeksma, R.Hoy | 4 th Year Design Project, U. of Toronto |
| 1979 | Hydrogen Engine Design | J. Leung, J. Warden | 4 th Year Design Project, U. of Toronto |
| 1979 | Total Hip Prosthesis Performance Test System | R. Marks, et.al. | 4 th Year Design Project, U. of Toronto |
| 1980 | Neutron Embrittlement Effects on Fatigue Behaviour of Structural Materials | S.J. Lee | B.S., U. of Toronto |
| 1980 | The Design of Microcomputer Control Data Acquisition System for Computer Aided Material Testing | M.A. Hastings | B.S., U. of Toronto |
| 1980 | A Statistical Investigation of Fatigue Crack Growth in the Threshold Region | E.A. Gallagher | B.S., U. of Toronto |
| 1980 | Photoelastic Demonstrator for Overhead Projector | C.C. Budreau | 4 th Year Design Project, U. of Toronto |

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| | | | Toronto |
| 1980 | A Design Case Study on DC-10 Cargo Door Latching Systems | J.J. Carcasole | 4 th Year Design Project, U. of Toronto |
| 1980 | Hydrogen Engine Design | C.C. Cummins | 4 th Year Design Project, U. of Toronto |
| 1980 | Design and Construction of a Sound, Heat, Fume Containment for a Hydraulic Power Supply | P.R. Forgang | 4 th Year Design Project, U. of Toronto |
| 1980 | Design and Construction of an Engine Dynamometer | R.A. Kostra, J.D. Mittle | 4 th Year Design Project, U. of Toronto |
| 1980 | Motorcycle Front Suspension System | F.G. Lion, T.P. Sanderson | 4 th Year Design Project, U. of Toronto |
| 1980 | Design and Construction of a System to View Fatigue in Situ in a Scanning Electron Microscope | C.G. Searles | 4 th Year Design Project, U. of Toronto |
| 1980 | Design and Fabrication of a Spin-Testing Facility | G.C. Smith | 4 th Year Design Project, U. of Toronto |
| 1980 | Design and Construction of a Micro-computer Controlled Robot Arm Prototype for Space Applications | B. Sooley | 4 th Year Design Project, U. of Toronto |
| 1980 | The Design of a Cracked Calibration Block for Ultrasonic Inspection | H.S. Vogt | 4 th Year Design Project, U. of Toronto |
| 1980 | Educational Fatigue Demonstration Machine | B.W. Wachon, et.al. | 4 th Year Design Project, U. of Toronto |

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| 1981 | The Retardation Effect of Variable Amplitude Loading on Fatigue-Crack Propagation | Conrad Yeung | B.S., U. of Toronto |
| 1981 | An Investigation into the Initiation of Propagation of Fatigue Cracks from Corrosion Pits in A1S1 C1045 Steel | J.R. Weekes | B.S., U. of Toronto |
| 1981 | A Study of Fatigue Crack Growth Behaviour of Grey Cast Iron | Patrick Lam | B.S., U. of Toronto |
| 1981 | Centrifugal and Thermal Stress Analysis of a Rotating Disk of Variable Thickness | William Lui, Derek Tang | 4 th Year Design Project, U. of Toronto |
| 1981 | An Arrestment Device for a Mine Conveyance | Casandra Cook | 4 th Year Design Project, U. of Toronto |
| 1981 | Design and Construction of a Fuel Efficient Vehicle for Energy in the Shell Fuelathon Competition | B. Bourne, W. Pillgrem, S.H.Y. Pui, E.P. Wunder | 4 th Year Design Project, U. of Toronto |
| 1981 | Improved Ore Blade Design | N.E. Chase | 4 th Year Design Project, U. of Toronto |
| 1981 | Ambulation for the Handicapped | A. Chong | 4 th Year Design Project, U. of Toronto |
| 1981 | Communication Interface for the Cerebral Palsey | P. Daldos, et.al. | 4 th Year Design Project, U. of Toronto |
| 1981 | Zone Refiner Design and Construction | J.S. Elder | 4 th Year Design Project, U. of Toronto |
| 1981 | Pushbutton Tap System | B.R. Kingsland | 4 th Year Design Project, U. of Toronto |
| 1981 | Surge Detection in Centrifugal Compressors by | M.R. Knonpczyns | 4 th Year Design |

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| | Vibration Analysis | ki | Project, U. of Toronto |
| 1981 | Prosthetic Heart Valve | W. Kosterman, et. al. | 4 th Year Design Project, U. of Toronto |
| 1981 | Automatic Bicycle Transmission | B. La Barbers, J.V. Sisson | 4 th Year Design Project, U. of Toronto |
| 1981 | Joystick Activated Device to Assist the Handicapped in Drawing | C.M. MacKenzie | 4 th Year Design Project, U. of Toronto |
| 1981 | Hammer Testing Device | K.M. Rieger | 4 th Year Design Project, U. of Toronto |
| 1981 | Dual Action Drum Pedal | J.D. Stauff | 4 th Year Design Project, U. of Toronto |
| 1982 | Fracture Mechanics Deliberations of Lugs | Albert Li | B.S., U. of Toronto |
| 1982 | Surface Finish Effects on the Fatigue Life of 1020 Steel | Patrick McConnell | B.S., U. of Toronto |
| 1982 | An Investigation into the Dovetail Post Failures of General Electric J85-15 Turbojet Eighth Stage Compressor Discs | William Unger | B.S., U. of Toronto |
| 1982 | Design of an Infinitely Variable Transmission for a Combine | Albert Li, Lawrence Kwan | 4 th Year Design Project, U. of Toronto |
| 1982 | Hammer Tester – Design and Construction | Charles Charron | 4 th Year Design Project, U. of Toronto |
| 1983 | Rotating Disc/Moving Model Automotive Aerodynamic Test Facility | John Allen | CED 401 Design Project, U. of Toronto |

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| 1983 | Design and Optimization of Spin Pit Testing | J.G. Argiropoulos | CED 401 Design Project, U. of Toronto |
| 1983 | High Speed System for Assaying Bacterial Growth Plates | Z. Astramowicz | CED 401 Design Project, U. of Toronto |
| 1983 | Robot Manipulator | J.M. Garcia, K.H. Wong | CED 401 Design Project, U. of Toronto |
| 1983 | Hybrid Vehicle Drive train Design | William G. Henderson | CED 401 Design Project, U. of Toronto |
| 1983 | High Speed Bacteria Growth Assayer | B.W. Hennenfent | CED 401 Design Project, U. of Toronto |
| 1983 | The Design of a Torsion Adaptor Mechanism | Howard M. Johnson | CED 401 Design Project, U. of Toronto |
| 1983 | Design of a Digitally Controlled Fuel Injection System Using a Hot-wire Anemometer Air Flow Meter | R.J. Douglas Reeves | CED 401 Design Project, U. of Toronto |
| 1983 | Design of a Gasoline Vapourizing Carburetor | Sean Andre Rockarts | CED 401 Design Project, U. of Toronto |
| 1983 | Hybrid Vehicle Design Engine Coupling | Joseph R. Scott | CED 401 Design Project, U. of Toronto |
| 1983 | Foetal Rabbit Incubation Apparatus | B.K. Moser-Shearer, M.M. Zurowski | CED 401 Design Project, U. of Toronto |
| 1983 | Hydraulic Service Manifold Coupling | Alvin Thomas | CED 401 Design |

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| | | | Project, U. of Toronto |
| 1983 | Design and Construction of an Abrasive Cut-Off Saw | Fraser Smith | CED 401 Design Project, U. of Toronto |
| 1983 | A High Speed Raster Graphics Processor | Henry Stracovsky | CED 401 Design Project, U. of Toronto |
| 1983 | Computer Assisted Spectrum Fatigue Testing | Gordon F. Ziebenhaus | CED 401 Design Project, U. of Toronto |
| 1983 | Effect of Stress State on Fatigue | H. Gordon Hamilton | B.S., U. of Toronto |
| 1983 | An Investigation Concerning Torsional Fatigue in 6061-T6 Aluminum Alloy | Howard M. Johnson | B.S., U. of Toronto |
| 1983 | Real-time SEM Observation of Fatigue-Induced Slip in Polycrystalline Copper and Alpha-Brass | Fraser Smith | B.S., U. of Toronto |
| 1983 | An Investigation Concerning the Fretting Fatigue Effects of AMS 6415 Steel and Al 7075-T6 Aluminum Fretting Pads on AMS 6415 Steel Specimens | Silvano Venuto | B.S., U. of Toronto |

Recent (2000-current) Grants and Contracts of David W. Hoepfner, P.E., Ph.D.

| TITLE | AGENCY | AWARD BEGIN & END DATES | TOTAL AWARD FOR ALL YEARS | PROJECT NUMBER | PRINCIPAL INVESTIGATOR & CO-PI |
|---|---|---|----------------------------------|-----------------------|---|
| Testing to Evaluate the Effects of Electroless Nickel Coating with Regard to the Fretting Fatigue Behavior of 2XXX Aluminum Alloy | Alcoa Aluminum | 5/1/00-12/31/00 | \$18,874 | 50500666 | P.I -David Hoepfner. |
| Multiaxial fatigue studies | Sverdrup Technology Arnold Air Force Base | 6/1/00-9/30/01 | \$50,000 | 54900488 | P.I -C. Elliott. Co P.I.-D. Hoepfner |
| Multiaxial fatigue studies | Sverdrup Technology Arnold Air Force Base | 9/30/02-9/30/03 | \$100,000 | 54900488 | P.I -C. Elliott. Co P.I.-D. Hoepfner |
| Corrosion Fatigue Structural Demonstration Program | Lockheed Martin Aeronautics | 7/1/00-4/30/03 to be extended to 6/30/03 | \$1,023,914 | 54900478 | P.I.- David Hoepfner- Co.P.I.-Paul Clark |

Past grants and contracts of David W. Hoepfner, P.E., Ph.D. He was the principal investigator on all of these listed below.

| SPONSORING AGENCY/ INDUSTRY | DURATION | AMOUNT | TITLE |
|---|---|---|--|
| U.S. Federal Aviation Administration | 3 years Ended June 1995 | \$391,696.00 | The Role of Fretting Corrosion and Fretting Fatigue in Rivet Hole Cracks. |
| U.S. Department of Transportation | 4 months (Ended 9/30/92) | \$9,977.00 | Preliminary Studies on the Role of Fretting Corrosion and Fretting Fatigue on Aircraft Rivet Hole Cracking |
| Boeing - Wichita, KS | 5 months (Ended 1/29/93; see below) NOTE: This is expected to be a multi-year effort funded at approximately \$100,000.00 per year beginning 2/93. | \$12,000.00 | Planning, Testing, and Development Methodology for Evaluation of Corrosion and Fatigue. |
| Boeing Commercial Airplane Company, Seattle, WA | 1 st year (Ended 12/92) | \$99,803.00 (Total was \$152,564.00) | Testing and Research Related to the Effect of Chemical Environment (Corrosion) and Load Spectra on the Prediction of Behavior of Aircraft Materials. |
| Boeing Commercial Airplane Company, Seattle, WA | 2 nd year ended December 1993 | \$92,000.00 | Testing and Research Related to the Effect of Chemical Environment (Corrosion) and Load Spectra on the Prediction of Behavior of Aircraft Materials. |
| Boeing Commercial Airplane Company, Seattle, WA | 3 rd year ended December 1994 | \$98,000.00 | Testing and Research Related to the Effect of Chemical Environment (Corrosion) and Load Spectra on the Prediction of Behavior of Aircraft Materials. |
| Boeing Commercial Airplane Company, Seattle, WA | 4th year ended December 1995 | \$104,000.00 | Testing and Research Related to the Effect of Chemical Environment (Corrosion) and Load Spectra on the Prediction of Behavior of Aircraft Materials. |

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| Rolls Royce, plc. Derby, England | 2 year-1993-94 NOTE: Rolls Royce funded approximately \$1,000,000.00 of research at University of Utah under David W. Hoepfner from May 1985-1993 | \$101,901.00 (2 year total \$207,492.00) | Modeling Short Crack Growth in IMI 834 Titanium Alloy. |
| Boeing - Wichita, KS | 3 months (Ends June 1993) | \$37,000.00 | Planning, Testing, and Development Methodology for Evaluation of Corrosion and Fatigue. |
| Air Force Office of Scientific Research (5-28034) | 1 year | \$102,677.00 | Pitting Corrosion Fatigue Modeling |

Note that during the period of 1985-2003 David Hoepfner had extensive amounts of research funding from numerous companies and government agencies. A detailed listing of these can be provided. In addition to the items listed above the following agencies provided funding during the period 1985-1992 as Dr. Hoepfner transitioned from the University of Toronto to the University of Utah:

Utah State Centers of Excellence for the development of the Quality and Integrity Design Engineering Center-\$22,000.00
Lockheed Aircraft Corporation-\$18,000.00
MTS Systems Corp. (Two scholarships to students totaling \$45,000.00)
Garrett Auxiliary Power Division (now Honeywell Turbine Division)-Phoenix, AZ - \$220,000.00
Consolidated Metco, Portland, OR-\$35,000.00
Gates Rubber Company, Denver, CO -\$88,675.00
Smith and Nephew Richards, Memphis, TN-\$37,000.00
Martin Marietta Corp., Denver, CO-\$130,509.00
Federal Aviation Administration-7 years of contracts at approximately \$14,000.00 per year to deliver a workshop here at the UU on Aircraft Structural Fatigue for FAA certification engineers and other country certification authorities.

In addition, Dr. Hoepfner was the co-principal investigator of several large grants to the Artificial Heart Laboratory here at the UU. He also was one of the Directors of Engineering at the Artificial Heart Laboratory during the period of 1985-1994. He was in charge of all matters concerned with Reliability and Quality. He was involved in numerous grants with NIH researching the development of the total electro-hydraulic heart and ventricular assist devices (VAD). He also served on several review panels connected with artificial hearts and VADs. In addition, he served on a panel working with NIH on the Bjork-Shiley 60° Convexo-concave artificial heart valve failure issues from

1987-94. He delivered numerous workshops at NIH, FDA, Abbot Labs, Ottawa (Ontario) Artificial Heart Institute, and others on reliability and quality issues in engineering design.

Grants and Contracts from 1974-1994:

| SPONSORING AGENCY/INDUSTRY | YEAR | AMOUNT | TITLE |
|--|------------------|---------------|--|
| Office of Naval Research | 1974-78-UM-C | \$308,415 | Research on Fretting Fatigue and Corrosion Fatigue |
| Lockheed California Co. | 1974-77-UM-C | \$95,587 | Fracture Research - Optimization of Behavior through Microstructural Control |
| Naval Ship Engineering | 1976-77-UM-C | \$61,985 | Various Fracture, Fatigue, and Corrosion Fatigue Issues facing Naval challenges. |
| Electric Power Research Institute | 1975-78-UM-C | \$824,407 | The Effect of Cyclic Load Chemical Environment, Load Wave Form, and Nuclear Irradiation on the Fatigue Crack Growth Behavior of Pressure Vessel Steels |
| U.S. Army Research Office | 1975-78-UM-C | \$88,925 | Fretting Fatigue and Corrosion Fatigue of Metallic Materials |
| Alcoa Research Foundation | 1975-77-UM-C | \$10,000 | Studies on Microstructural Effects in Fatigue |
| U.S. Air Force Office of Scientific Research | 1976-79-UM-C | \$90,000 | Corrosion Fatigue of Aircraft Structural Materials |
| National Science Foundation | 1975-77-UM-C | \$42,000 | Undergraduate Equipment Grant – Mechanical Behavior of Materials |
| McDonnell Douglas Aircraft Co. | 1976-77-UM-C | \$50,000 | Fatigue Testing |
| Smith and Lovelace Engr. Co. | 1976-UM-C | \$500 | Failure Analysis |
| Cameron Iron Works | 1977-78-UM-C | \$60,000 | Fatigue of Gate Valve Materials |
| NSERC Operating | 1979-84- U of T. | \$509,872 | Fatigue |

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| and Capital Equipment | | | |
| EMR | 1979-82- U of T. | \$31,000 | Corrosion fatigue research |
| Ontario Hydro | 1979-82- U of T. | \$84,200 | Corrosion and Thermal fatigue research. |
| FAA | 1979-82- U of T. | \$55,134 | Workshops on Aircraft Structural Fatigue |
| WKM | 1979-80 | \$55,200 | Studies on fatigue and fracture of valve materials |
| Pratt & Whitney | 1979-83 | \$176,550 | Fretting fatigue studies. |
| Turbodyne | 1979-81 | \$13,500 | Fatigue Crack propagation studies |
| Bicknell Foundation | 1980-81 | \$10,000 | |
| Detroit Edison | 1980-81 | \$15,000 | |
| Rolls Royce, Ltd. | 1980-83 | \$139,965 | Modeling fatigue behavior of turbine materials. |
| Connaught, U. of Toronto | 1981-83 | \$585,140 | SEM, grant to develop SIFFRL (Structural Integrity, Fatigue and Fracture Research lab). |
| NAE/DSS | 1982-83 | \$43,630 | Corrosion fatigue studies of aircraft joints. |
| BILD | 1982-83 | \$46,000 | Ontario grant for fretting fatigue studies. |
| MTS – Fellowship | 1982-83 | \$7,500 | Fellowship for graduate student studying in structural integrity. |
| Ontario Hydro | 1982-83 | \$19,800 | High Temperature studies of fatigue crack propagation-Phase III |
| Pratt & Whitney Canada | 1982-85 | \$30,000/yr | Corrosion Fatigue |
| National Aeronautical Establishment | 1982-85 | \$139,514 | Retirement for Cause- |
| Natural Sciences and Engineering Research Council of Canada (NSERC) | 1982-85 | \$205,000 | Fatigue and fretting fatigue studies. |
| Rolls Royce, Ltd. | 1982-83 | \$62,000 | Modeling fatigue behavior of gas turbine materials. |
| McAllister Fund | 1982-84 | \$12,500 | Grant for QIDEC development. |

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| Pratt & Whitney Canada | 1983-84 | \$20,000 | Fretting Fatigue studies. |
| Rolls Royce, Ltd. | 1983-84 | \$166,000 | Crack Nucleation and Propagation, Single Crystal Model, Multiaxial Fatigue |
| NAE | 1983-84 | \$90,000 (2 yrs) | Damage Tolerant Disk Design |
| Ontario Hydro | 1983-84 | \$97,000 (3 yrs) | Corrosion Fatigue |
| Defense Research Establishment Pacific | 1983-84 | \$50,000 | Damage Tolerant Engine Design – AGARD |
| FAA | 1983-84 | \$17,000 | Aircraft Structural Fatigue Course at U. of Toronto |
| Rolls Royce, Ltd. | 1983-85 | \$52,720/yr | Crack Generation in turbine materials. |
| Rolls Royce, Ltd. | 1983-85 | \$42,360/yr | Fracture Model/FCC materials. |
| Rolls Royce, Ltd. | 1983-85 | \$77,590 | Spin Pit studies of fatigue crack propagation. |
| Pratt & Whitney Canada | 1983-85 | \$55,000 | Fretting Fatigue studies. |
| NSERC | 1983-85 | \$59,600 | Fretting Fatigue studies. |
| Spectravac Inc | 1983-84 | \$5,482 | Failure analysis of wind turbines. |
| Pratt & Whitney Canada | 1984-85 | \$30,000 | Biaxial Fatigue studies. |
| Pratt & Whitney Canada | 1984-85 | \$45,000 | Thermomechanical Fatigue |
| Ontario Hydro | 1984-85 | \$33,000 | Corrosion Fatigue |
| Defense Research Establishment | 1984-85 | \$52,000 | Fatigue behavior of materials for advanced applications. |
| Garrett Aux/Allied Signal | 1985-88 | \$117,249 | Multiaxial fatigue studies on turbine and compressor materials. |
| Garrett Aux/Allied Signal | 1985 | \$117,700 | Multiaxial fatigue studies on turbine and compressor materials. |
| Rolls Royce Limited | 1985 | \$41,643 | Development of a Quantitative Fracture Model for FCC Superalloys |
| Research Instrumentation | 1985 | \$8,000 | Upgrade of Mechanical Test Facility of the College of |

| Fund | | | Engineering |
|-----------------------------------|-------------------------------------|-------------|--|
| U.S. FAA | 1985 (for courses taught in 1985/6) | \$28,080.00 | Aircraft Structural Fatigue Course-Two week course at UU. |
| U.S. FAA | For courses taught in 1987-91 | \$80,000.00 | Aircraft Structural Fatigue Course-Two week course at UU. |
| Lockheed Advanced Aeronautics Co. | 1985 | \$23,229 | Development of Titanium Alloys for Advanced Aerospace Applications |
| Rolls Royce Aeroengine Division | 1985-86 | \$58,573 | The Effect of Anisotropic Material Behavior upon Fatigue Crack Propagation in Rotating Discs |
| Rolls Royce Limited | 1985-86 | \$64,155 | Crack Generation and Propagation Studies on Disc and Blade Materials |
| Biomedical Research Support Group | 1986 | \$5,200 | Evaluation and Durability of Artificial Hearts |
| Biomedical Research Support Group | 1986 | \$7,700 | Research on Development of Test Standards for the Evaluation of Reliability-Durability of Artificial Hearts |
| Rolls Royce Limited | 1986-87 | \$73,988 | "Development of a Quantitative Fracture Model for FCC Alloys" |
| MTS Systems Corp. | 1986-87 | \$10,000 | One-half of a fellowship for a graduate student |
| Garrett Aux/Allied Signal | 1986-88 | \$114,876 | Anisotropic Material |
| Rolls Royce Limited | 1987-88 | \$56,303 | "The Effect of Anisotropic Material Behavior upon Fatigue Crack Propagation in Rotating Discs" |
| Rolls Royce Limited | 1987-88 | \$20,754 | "Quantitative Representation of the Microstructural Contribution to Fatigue Crack Nucleation and Growth" |
| Rolls Royce Limited | 1987-88 | \$17,920 | Material Damage Mechanisms and Size Effects on the Fatigue Behavior Titanium Alloy under Dwell Conditions of IMI 829 |

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| Rolls Royce Limited | 1987-88 | \$19,963 | "Crack Propagation Thermodynamics" |
| MTS Systems Corporation | 1987-88 | \$10,000 | One-half Fellowship for a graduate student |
| Biomedical Research Group | 1987-88 | \$8,250 | Durability and Reliability Testing of Artificial Heart Components |
| Rolls Royce Limited | 1987-90 | \$211,642 | Modeling Short Crack Growth in a Nickel Base Superalloy |
| Rolls Royce Limited | 1987-90 | \$142,370 | Fatigue Behavior and Modeling of Gas Turbine Materials |
| Rolls Royce Limited | 1987 | \$27,000 | Fatigue Behavior and Modeling of Gas Turbine Materials |
| Rolls Royce Limited | 1987 | \$208,216 | Fatigue Behavior and Modeling of Gas Turbine Materials |
| Rolls Royce Limited | 1987-89 | \$27,000 | Fatigue Behavior and Modeling of Gas Turbine Materials |
| National Institute of Health-Co principal inv. | 1987-93 | \$6,000,000 | Development of Implantable Electrohydraulic Total Artificial Heart |
| U.S. Air Force, Ogden Air Logistics Center | 1988 | \$5,000 | Fatigue Testing of laser peened materials |
| Brown and Sharpe | 1988 | \$20,000 | Metrology Equipment proposal |
| Ottawa Heart Institute Co-principal investigator | 1988-92 | \$3,200,000 | Development of an Electrohydraulic Ventricular Assist Device |
| Center of Excellence | 1988-90 | \$210,000 | Center of Excellence QIDEC |
| Rolls Royce | 1988-90 | \$169,370 | Modeling Short Crack Growth |
| Eastman-Christensen | 1989 | \$4,800 | K _{IC} Determination |
| Federal Aviation Administration | 1989 | \$30,372 | Aircraft Structural Fatigue |
| Dept. of Economics | 1989-91 | \$60,000 | Center for Quality/Integrity |
| Garrett Auxiliary Power | 1989 | \$220,000 | Evaluation and Testing of multiaxial stress effects on fatigue. |
| Rolls Royce Limited | 1989 | \$63,241 | Fatigue of gas turbine materials-modeling studies. |
| Brown & Sharp | 1989 | \$6,750 | Metrology Equipment. |

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| Metro | | | |
| GTE Lectureship Program | 1989 | \$4,000 | Fatigue and fracture mechanics related activities. |
| Wash. DC/Basic Energy | 1989 | \$108,946 | Fatigue and fracture mechanics related activities. |
| Wash. DC/Energy System | 1989 | \$107,458 | Fatigue and fracture mechanics related activities. |
| Garrett Aux/Allied Signal | 1989 | \$14,000 | Fatigue of gas turbine materials. |
| Utah/Dept of Comm. Economics | 1989 | \$60,000 | QIDEC-Center of Excellence development grant. |
| Gates Rubber | 1989-90 | \$88,675 | Dual Stroke Testing |
| Lockheed | 1989-90 | \$24,800 | Testing of Titanium Heat Treat Specimens |
| MTS | 1989-90 | \$15,000 | MTS Equipment |
| Garrett Aux/Allied Signal | 1989-90 | \$14,000 | Fatigue of gas turbine materials-2. |
| Salt Lake Community College | 1989 | \$2,535 | Specimen Testing |
| National Science Foundation w/ Dr. Meek | 1990-91 | \$42,109 | Research-Mechanical Engr. |
| Brown & Sharp Metro | 1990 | \$2,858 | Metrology equipment for ME. |
| National Science Foundation | 1990 | \$42,109 | Research/Mechanical Engr.-with Dr. Elliott. |
| Rolls Royce Limited-Derby, England | 1990-92 | \$208,216 | Fatigue and Fracture Behavior of Titanium Alloys for gas turbine applications. |
| Boeing Commercial Airplane Company | 1991-92 | \$152,564 | Corrosion Fatigue of Aircraft Alloys. |
| Dept. of Comm./Economics -UT | 1991 | \$211,880 | Center of Excellence Grant-QIDEC. |
| Boeing Commercial Airplane Company | 1991 | \$101,466 | Corrosion fatigue of Aircraft Materials |
| Boeing Commercial | 1991 | \$52,761 | Corrosion fatigue of Aircraft Materials |

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| Airplane Company | | | |
| Boeing Commercial Airplane Company | 1991 | \$99,803 | Corrosion fatigue of Aircraft Materials |
| Boeing Commercial Airplane Company | 1992-93 | \$92,000 | Effects of Stress and Chemical Environment on Fatigue and Fracture of Aircraft Materials |
| Boeing Military Airplane Company, Wichita, KS | 1992-94 | \$249,921 | Evaluation of Corrosion and its affects on Aircraft Integrity. |
| U.S. FAA | 1992 | \$125,091 | Fretting Fatigue Research |
| U.S. FAA | 1992 | \$100,516 | Literature search for Fretting of Aircraft Joints. |
| Martin Marietta Corp. | 1992 | \$130,509 | Fracture and Fatigue research. |
| DOT- U.S. FAA | 1992 | \$9,977 | Rivet Hole Cracking of Aircraft Joints-failure assessment of part failure. |
| U.S. FAA | 1992 | \$125,091 | Rivet Hole Cracking of Aircraft Joints |
| Boeing Commercial Airplane Company | 1992 | \$249,921 | Evaluation of Corrosion |
| Boeing Commercial Airplane Company | 1992 | \$92,000 | Corrosion/Load Spectrum |
| Dept. of Transportation | 1992 | \$9,977 | Rivet Hole Cracking |
| U.S. FAA | 1992-93 | \$125,091 | Rivet Hole Cracking of Aircraft Joints. |
| U.S. Air Force | 1993-97 | \$399,000.00 | Material Degradation and Aerospace Vehicle Fatigue, |
| U.S. FAA | 1993 | \$50,000 | Fatigue Testing of various joints. |
| U.S. FAA | 1993 | \$156,531 | Aircraft Rivet Hole Cracking. |
| Conmet, Portland, OR | 1993-94 | \$10,315 | Testing Wheel Hub Specimens |

CONSULTING Dr. Hoepfner has consulted with all major airframe and aircraft engine companies of North America as well as all divisions of DOD, NIH, DOE, NASA, DOT, and the FAA as well as numerous foreign manufacturers and aircraft regulatory agencies as well as medical device manufacturers and regulators. Dr. Hoepfner was the originator and principal lecturer in a workshop entitled "Aircraft Structural Fatigue". This workshop was a two-week affair conducted for the US FAA and other airline certification bodies from around the world. He conducted this workshop from 1978-92 at the U. of Toronto under contract to the US FAA. He then presented this workshop at the UU from 1985-92. Part of Dr. Hoepfner's consulting over the past 20 years has been to give many briefings to NRC-Canada, FAA, USAF, USN, NASA and company personnel on Corrosion and Corrosion Fatigue, fretting fatigue, and use of fracture mechanics based lifeing systems to assure aircraft structural integrity. As well, Dr. Hoepfner has consulted extensively on activities related to artificial hearts, heart valves, ventricular assist devices, orthopaedic implants, and other medical devices. He has consulted with companies and the FDA, and NIH and has served on several national and international review panels on these medical devices. He has served as the lead technical expert witness on high profile aircraft and biomedical cases such as the Sioux City DC 10 catastrophe (UA 232) and recent fire fighting tanker crashes (2002-2006). He has done extensive consulting with Rolls Royce, Boeing, Lockheed Martin, USN, USAF, NASA, and Pratt and Whitney Canada. He also has consulted extensively with the Canadian Department of National Defense as well as the National Research Council of Canada. He also has conducted workshops on fatigue, damage tolerance, corrosion, corrosion fatigue and related areas applied to aircraft including both airframes and engines at Canada's Quality Engineering Test Establishment and NRC-IAR as well as numerous other facilities. In addition, Dr. Hoepfner worked extensively with Rolls Royce Aeroengine Company (Derby, England) from 1973-1996. He also has consulted with the British Ministry of Defense as well as NATO in various capacities. A significant activity was his chairing the **TURBISTAN** working group of Europe from 1980-88. This group developed the first fatigue standard spectrum for evaluating fatigue behavior of cold and hot discs in gas turbine engines.

SHORT COURSES Dr. Hoepfner developed, coordinated and was the principal lecturer for 14 courses entitled, "Aircraft Structural Fatigue" for the **U.S. Federal Aviation Administration**, Transport Canada, and International Aviation personnel. This class was delivered at both the University of Toronto (1978-85) and the University of Utah (1985-1992).

Dr. Hoepfner and Dr. John DeLuccia developed and presented a workshop on "**Corrosion of Aging Aircraft**" at UCLA, Los Angeles from 1991-2004. This workshop is continuing and was recently presented at the Naval Air Station-Alameda, CA. In addition it was presented at the Naval Aviation Depot at both San Diego, CA and Jacksonville, FL in 1999. Dr. Hoepfner and Dr. John DeLuccia in 2002 presented two workshops on "**Corrosion of Aging Aircraft and Systems**" at the National Research Council of

- Canada in Ottawa, Ontario, Canada. IN 2009 Dr. Hoepfner presented this workshop for UCLA to DCMA in Hartford, CT with Dr Pierre Roberge as Dr. DeLuccia died early in 2009.
- Dr. Hoepfner and Dr. John DeLuccia presented a workshop on "**Corrosion of Aging Aircraft and Space Systems**" in 2004 at NASA-Johnson Space Center to various Engineering Personnel after the Columbia Accident Review Report Recommend upgrading in this area as well as others.
- Dr. Hoepfner has been the organizer and principal lecturer for several short courses on "**Practical Considerations in Structural Fatigue and Damage Tolerant Design of New and Aging Aircraft**," held in Park City, and Salt Lake City, Utah from 1992-2001. Participants have included all major airframe and Aeroengine manufacturers, certification authorities, operators and aircraft maintenance and inspection personnel and worldwide military personnel.
- Dr. Hoepfner has lectured since 1971 in the SAE course entitled, "**Fatigue Concepts in Design**". He was one of six lecturers in the course. His lectures focused on issues on fatigue design, mechanisms of fatigue, fatigue of structural materials, corrosion fatigue, and fretting fatigue. The course ended in 2001 after a 30 year run.
- Dr. Hoepfner has lectured since 1970 in the UCLA short course entitled, "**Structural Integrity of New and Aging Aircraft**". His lectures focus on fatigue design, mechanisms of fatigue, and fatigue of structural materials, damage tolerance concepts, corrosion fatigue, and fretting fatigue. In Sept. 2006 he lectured in a version of this course for the U.S. FAA and Transport Canada at UCLA. This course has been offered at many on site locations for both industry and government over its run.
- Dr. Hoepfner lectured in the course entitled "**Applied Fracture Mechanics**" held at Union College and sponsored by ASME, 1970-1981.
- Dr. Hoepfner has presented short courses at many government agencies and industrial firms in the United States, Canada, England, Japan and Korea. This includes NIH, FDA, DOD agencies, NASA, DOT, FAA, and numerous industries.
- Dr. Hoepfner has organized and presented many workshops on reliability of medical devices for industry and governments of the US and Canada.

PUBLICATIONS and PRESENTATIONS

Hoepfner, D. W., Invited **Keynote** paper for the sixth international symposium on Fretting Fatigue, for presentation and submission for publication, meeting to be held in Chengdu, China, April 2010, Title- “Fretting Fatigue Considerations in Holistic Structural Integrity Based Design Processes (HOLSIP)- A continuing evolution”, in preparation.

Hoepfner, D. W., Invited Chapter on “Standard Test Methods”, in AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles, NATO, RTO, NATO, France, February 2010, in press.

Hoepfner, D. W., Invited Chapter on “Simulating Pitting Corrosion on Aircraft Materials”, in AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles, NATO, RTO, NATO, France, February 2010, in press.

Hoepfner, D. W., Invited Chapter on “Simulating Fretting Wear and Corrosion on Aircraft Materials”, in AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles, NATO, RTO, NATO, France, February 2010, in press.

Hoepfner, D. W., “Definitions and Terminology”, Invited Chapter in AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles, NATO, RTO, NATO, France. **May 2009**, in press 2010, to be published.

Hoepfner, D. W., “Cyclic Loading and Cyclic Stress”, Invited Chapter in Tribology Encyclopedia, **July 2009**, in press 2010, to be published.

Hoepfner, D.W, “Corrosion Fatigue of Metallic Alloys”, Chapter in Tribology Encyclopedia, **August 2009**, in press 2010, to be published.

Hoepfner, D. W., “Fretting Corrosion”, Invited Chapter in **AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles**, NATO, RTO, NATO, France. **September 2009**, in press 2010, to be published.

Hoeppepner, D. W., "Corrosion Fatigue and Pitting Corrosion Fatigue", Invited Chapter in **AVT-140 Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles**, NATO, RTO, NATO, France. **September 2009**, in press 2010, to be published.

Hoeppepner, D. W., Invited Chapter, "Environmentally Assisted Crack Growth of Metallic Alloys- Item 5H", for NATO RTO HANDBOOK, **Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles**, January 2010, in press, 2010.

Hoeppepner, D. W., Invited Chapter, "Pitting Corrosion- Morphology and Characterization", for NATO RTO HANDBOOK, **Corrosion Fatigue and Environmentally Assisted Cracking in Aging Military Vehicles**, January 2010, in press, 2010.

Ariscoretta, C., Hoeppepner, D.W., "Statistical Factorial Modeling for Corrosion Fatigue of Aluminum Alloy", Submitted to Corrosion Science for publication, **2009**, in review 2010.

Jones, Kimberli, Shinde, Sachin R., Clark, Paul N., Hoeppepner, David W., "Effect of Prior Corrosion on Short Crack Behavior in 2024-T3 Aluminum Alloy." **Corrosion Science**, September 2008, Vol. 50, No. 9, pp. 2588-2595.

Hoeppepner, D. W., Shinde, S., Keynote Paper, "Fretting Fatigue Design Considerations in Holistic Structural Integrity Based Design", Presented at the 5th International Symposium on Fretting Fatigue held in Montreal, Quebec, Canada, April, 2007, not published.

Hoeppepner, D.W., Ariscoretta, Carlos, "Exfoliation Corrosion and other corrosion effects on Aircraft Structural Integrity, in preparation for an invited paper to Journal of Aerospace Sciences. (2010)

Jones, K, and Hoeppepner, D.W., "Effect of Microstructure on Pit-to-Crack Transition of 7075-T6 Aluminum Alloy," *Fatigue and Fracture Mechanics, ASTM STP 1480*, R.E. Link and K.M. Nikbin (eds.), American Society for Testing and Materials International, Mayfield, PA, 2008, pp. 271-280.

Shinde, S., Hoepfner, D. W., Applications session keynote paper, "Fretting Fatigue Case Studies and Failure Analysis in Holistic Structural Integrity Closed Loop Design", Presented at the 5th International Symposium on Fretting Fatigue held in Montreal, Quebec, Canada, April, 2007, not published-in preparation for submission to Tribology International.

Jones, K., Hoepfner, D., "The Interaction Between Pitting Corrosion, Grain Boundaries, and Constituent Particles During Corrosion Fatigue of 7075-T6 Aluminum Alloy", **International Journal of Fatigue**, February 2009, Vol. 31, pp. 686-692.

Hoepfner, D. W., "Structural Integrity Paradigms in Engineering Design", **Invited Presentation** to the Utah Society of Professional Engineers at their annual meeting, May 13, 2006. Not published.

Shinde, S., Elliott, C., and Hoepfner, D., "Quantitative Analysis of Fretting Fatigue Degradation in 7075-T6 Aluminum Alloy", **Tribology International Journal**, v 40 (2007) pp 542-547.

Shinde, S., and Hoepfner, D., "Observations on Fretting Damage Transition to Cracking: State of the Art and Preliminary Observations", presented at the Fourth International Symposium held at Lyon, France in May, 2004, **Tribology International**, (published online), volume 39 (2006), pp 1271-1276.

Jones, Kimberli, Hoepfner, D.W., "Prior corrosion and fatigue of 2024-T3 aluminum alloy," **Corrosion Science**, Vol 48, no.10, October 2006, pp 3109-3122.

Shinde, S., and Hoepfner, D., "Quantitative Analysis of Fretting Wear Crack Nucleation in 7075-T6 Aluminum Alloy using Fretting Maps", **Wear**, Volume 259, Issues 1-6, July-August 2005, Pages 271-276.

Kimberli Jones, David W. Hoepfner. "Effect of Microstructure on Pit-to-Crack Transition of 7075-T6 Aluminum Alloy." Presented at the Fifth International ASTM/ESIS Symposium on Fatigue and Fracture held May 2005, Reno, Nevada, also with peer-reviewed publication.

- Shinde, S., and Hoeppe, D., "Observations from Fractographic Examination of Fretting Fatigue Surfaces", **Materials Characterization Journal**
- Shinde, S., and Hoeppe, D., "Fretting Fatigue Degradation Characterization in 7075-T6 Aluminum Alloy", Proceedings of the 2nd **JSME/ASME** International Conference on Material and Processing, Seattle, USA, June 19-22 2005.
- Shinde, Sachin R., Hoeppe, David W., "Fretting Fatigue behavior in 7075-T6 aluminum alloy", **Wear**, v 261, (2006) pp 426-434.
- Smiltneek, L., Shinde, S., Hoeppe, D., "A Single Cylinder In-Situ SEM Fatigue System", **Review of Scientific Instruments**, American Institute of Physics, vol. 77, pp 1-4, 2006.
- Clark, P.N., Jones, K., Huang, J.T., and Hoeppe, D.W., "Observations from the Inspection of an Aged Fuselage Panel," **Journal of Aircraft**, Vol. 42, No. 6, 2005, pp. 1403-1408.
- Bellinger, N., Hoeppe, D.W., "The Age for Reason", Invited Presentation by Nick Bellinger to CAMC (Canadian Aviation Maintenance Council), October, 2005, not published.
- Okada, T. and Hoeppe, D. W., "The Behavior of Short Cracks in Corrosive Environments for 7075 Al Alloy", presented at ICAF 2005, Hamburg, Germany, 2005, ICAF2005 - Structural Integrity of Advanced Aircraft and Life Extension for Current Fleets - Lessons Learned in 50 Years after the Comet Accidents, Vol. 2, Edited by Claudio Dalle Donne, Proceedings of the 23rd Symposium of the International Committee on Aeronautical Fatigue, pp. 613-622.
- Jones, K., Hoeppe, D.W., "Pitting Corrosion, Grain Boundaries, and Constituent Particles: Which One Will Win the Crack Nucleation Race", Presented at the International Committee of Aeronautical Fatigue Meeting, Hamburg, Germany, June 2005, published in the proceedings.
- Clark, Paul N., Jones, Kimberli, Hoeppe, David W., "Pitting Behavior and Residual Fatigue Life of 7075-

T6 Aluminum Extruded C-141 Wing.” Poster/Paper presented at the International Committee on Aeronautical Fatigue (ICAF) 2003, Lucerne, Switzerland.

Jones, Kimberli, and Hoeppepner, David W., “Pit-to-Crack Transition in Prior-corroded 2024-T3 Aluminum Alloy Under Cyclic Loading”, **Corrosion Science** (2005), pp 2185-2198.

Keynote Invited Presentation, Hoeppepner, D.W., “From Safe Life to Holistic Structural Integrity-A Journey in Aircraft Lining Considerations”, Feb. 16, 17, 2005, Conference on Aircraft Structural Integrity, US Coast Guard Aircraft Repair and Support Center, Elizabeth City, N.C. Presentation only.

Hoeppepner, D. W., **Invited Keynote Paper** entitled “Fretting Fatigue Case Studies of Engineering Components”, presented at the Fourth International Symposium held at Lyon, France in May, 2004. Tribology International, Tribology International Published on line, volume 39 (2006) pp 1028-1035.

Jones, K., Hoeppepner, D.W., “Pit-to-Crack Transition in Pre-corroded 7075-T6 Aluminum Alloy Under Cyclic Loading”, Corrosion Science, 2005, Vol. 47/9, pp. 2185-2198.

Hoeppepner, D.W., “A Review of Corrosion Fatigue and Corrosion/Fatigue Considerations in Aircraft Structural Design”, Invited paper presented at International Conference on Fatigue of Aircraft, Lucerne, SW, May, 2003, **ICAF 2003-Fatigue of Aeronautical Structures as an Engineering Challenge**, Vol. 1, Edited by M. Guillaume, Proceedings of the 22nd Symposium of the International Committee of Aeronautical Fatigue, EMAS Publishing, Sheffield, England, 2004, pp 425-438.

Hoeppepner, D. W., Restis, J., Reid, Len, “Fatigue Life Enhancement of Structure in the Presence of Corrosion Using Cold Expansion”, Presented at the Tri-Service Conference on Corrosion, 2003, published in the conference proceedings.

Clark, Paul N., Jones, Kimberli, Huang, J.T., Hoeppepner, David W. “Observations From the Inspection of an

Aged Fuselage Panel”, Presented at the USAF Structural Integrity Program, December 2002, Published on line in conference proceedings.

Clark, P.N., Jones, Kimberli, Huang, J.T., Hoepfner, D.W., “Observations From the Inspection and Sectioning of an Aged Fuselage Panel”, *Aircraft Structural Integrity Program*, Conference 2002 proceedings, Savannah, GA, 2002.

Kinyon, S.E., **Hoepfner, D.W.**, and Mutoh, Y., **Editors**, ***Fretting Fatigue: Advances in the Basic Understanding and Applications, STP 1425***, American Society for Testing and Materials International, West Conshohocken, PA. 2003.

Hoepfner, D. W., **Keynote paper**, “Fretting Fatigue Life Prediction: Past, Present and Future”, Presented at the Third International Symposium on Fretting Fatigue, Nagoaka, Japan, May, 2001, Presentation only.

Clark, P. N., Hoepfner, D.W., “Fretting Fatigue Initial Damage State to Cracking State: Observations and Analysis”, ***Fretting Fatigue: Advances in the Basic Understanding and Applications, STP 1425***, S.E. Kinyon, D.W. Hoepfner, and Y. Mutoh, Eds., American Society for Testing and Materials International, West Conshohocken, PA, pp 44-58, 2003.

Hoepfner, D.W., Taylor, Amy M.H., Venkatesan, Chandrasekaran, “Fretting Fatigue Behavior of Titanium Alloys”, ***Fretting Fatigue: Advances in the Basic Understanding and Applications, STP 1425***, S.E. Kinyon, D.W. Hoepfner, and Y. Mutoh, Eds., American Society for Testing and Materials International, West Conshohocken, PA, pp 291-306, 2003.

Hoepfner, D.W., “From No-life to safe life to HOLISTIC Structural Integrity Based Design”, **Distinguished Invited Presentation and Paper for the workshop on Structures, Materials, and Propulsion**, Held at National Research Council-Canada, Ottawa, Ontario, Canada, July, 2002. Published in the workshop proceedings.

Clark, P.N., Hoepfner, D.W., "Pitting Behavior and Fatigue Life of 2024-T3 Aluminum", Journal of the Mechanical Behavior of Materials, v. 13, no. 2, pp 91-105, 2002.

Clark, P.N., Hoepfner, D.W., Huang, J.T., Falugi, M., "Corrosion Pitting Behavior of 2024-T3 Aluminum Considering the Effects of Loading and Sheet Thickness", US Air Force Structural Integrity Conference, December, 2001, published in conference proceedings.

Jerzy P. Komorowski, David S. Forsyth, Nicholas C. Bellinger and David W. Hoepfner, "Life and Damage Monitoring-Using NDI Data Interpretation for Corrosion Damage and Remaining Life Assessments", Published in the Proceedings of the RTO Specialist's Meeting on Life management for aging air Vehicles, Paper No. 13, Manchester, UK, 08-11 October 2001.

Pantalos GM, Altieri F, Berson A, Borovetz H, Butler K, Byrd G, Ciarkowski AA, Dunn R, Frazier OH, Griffith B, Hoepfner D.W., Jassawalla JS, Kormos RH, Kung RT, Lemperle B, Lewis JP, Pennington DG, Poirier VL, Portner PM, Rosenberg G, Shanker R, Watson JT, "Long-term mechanical circulatory support system reliability recommendation: American Society for Artificial Internal Organs and The Society of Thoracic Surgeons: long-term mechanical circulatory support system reliability", Ann Thorac Surg. 1998 Nov;66(5):1852-9.

Elliott, C.B. III, Hoepfner, D. W., "The Importance of Wear and Corrosion on the Fretting Fatigue Behavior of two Aluminum Alloys", WEAR, v236, (1999), 128-133.

Hoepfner, D.,W., Invited Keynote Paper, " An Historical Overview of Fretting Fatigue Mechanisms-II", Second International Conference of Fretting Fatigue- held in at the U. of Utah, Sept, 1998, incorporated in the summary paper for **Fretting Fatigue: Current Technology and Practices**, ASTM STP 1367, pp ix-xi, January 2000.

Venkatesan, Chandrasekaran, Yoon, Young In, and Hoepfner, D.W., "Analysis of Fretting Damage Using Confocal Microscope", *Fretting Fatigue: Current Technology and Practices*, ASTM STP 1367, D.W.

Hoeppe, V. Chandrasekaran and C.B. Elliott, Eds., American Society for Testing and Materials, West Conshohocken, PA, 2000, pp 337-351.

Kinyon, S., Hoeppe, D.W., "Spectrum Load Effects on the Fretting Fatigue Behavior of Titanium-6Al-4V", *Fretting Fatigue: Current Technology and Practices*, ASTM STP 1367, D.W. Hoeppe, V. Chandrasekaran and C.B. Elliott, Eds., American Society for Testing and Materials, West Conshohocken, PA, 2000, pp 100-118.

Goswami, T., Hoeppe, "Transition Criteria-From a Pit to a Crack", Journal of the Mechanical Behavior of Solids, V. 10, Nos. 5-6, pp 261-278, 1999.

Hoeppe, D. W., Chandrasekaran, V., Taylor, A., "Review of Pitting Corrosion Fatigue Models", **Structural Integrity for the Next Millennium**, Editors J. Rudd, R. Bader, Proceedings of the 20th Symposium of the International Committee on Aeronautical Fatigue, ICAF, Electronic Print Imaging Corp., Dayton, OH, 1999, pp 253-277.

Chandrasekaran, V., Sauer, W., Taylor, A., Hoeppe, D., "Evaluation of the fretting corrosion behavior of the proximal pad taper of a modular hip design", Wear, (1999) pp54-64.

Mills, T.B., Hoeppe, D.W., Paul, C.A., "The Effects of Exfoliation Corrosion on the Fatigue Response of Aluminum Alloy 7075-T651", presented at AIAA Structures and Materials Symposium, April, 1998, published in the conference proceedings.

Thomsen, M.L., Hoeppe, D.W., "The Effect of Dwell Loading on the Strain Accumulation Behavior of Titanium Alloys", International Journal of Fatigue, vol. 20, no. 4, Elsevier Science Ltd., 1998, pp309-317.

Thomsen, M. L., Hoeppe, D.W., "The Effect of Dwell Loading on the Strain Accumulation Behavior of Titanium Alloys", International Journal of Fatigue, Vol. 20, no. 4, pp 309-317.

Kinyon, S.E., Hoeppe, D.W., "A Finite Element Analysis of A Riveted Joint", Presented at the NASA, FAA, USAF First Conference on Structural Integrity of Aging

Aircraft, Ogden, UT, July, 1997, Proceedings of the First DoD/FAA/NASA Conference on Aging Aircraft, USAF/Universal Technology Corp., 1998, Vol. II, pp 1817-1834.

Elliott, C.B. III, Hoeppe, D.W., Schoess, J.N., "Chemical Analysis of Liquid Environments Internal to the KC-135 Aircraft", Presented at the NASA, FAA, USAF First Conference on Structural Integrity of Aging Aircraft, Ogden, UT, July, 1997, Proceedings of the First DoD/FAA/NASA Conference on Aging Aircraft, USAF/Universal Technology Corp., 1998, vol. I, pp 425-438.

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Taylor, A.M.H., Hoeppe, D.W., "The Effect of Prior Corrosion Damage on the Short Crack Growth Rates of Two Aluminum Alloys, Presented at the USAF conference on Structural Integrity, Dec. 1997, published in the Conference Proceedings.

Hoeppe, D.W., **invited speaker**, "Corrosion and Corrosion Fatigue of Aircraft: Accidents, Incidents, and Progress", MTS Corporation, Minneapolis, MN, July 1997.

Nichols, K., Hoeppe, D.W., **invited paper**, "Holistic Test and Evaluation of Turbine Engine Components for High Cycle Fatigue", Presented at the AIAA Conference on Gas Turbine Engine Integrity held at Arnold Air Engineering Center, 1995, Selected as the Outstanding Paper of the Conference, **AIAA Journal of Propulsion and Power, Proceedings of the XIII International Symposium on Air Breathing Engines (ISABE)**, Chattanooga, Tennessee, September 1997.

Hoepfner, D.W., **Invited lead refereed paper**, "Industrial Significance of Fatigue Problems", ASM Handbook-volume 19, Fatigue and Fracture, ASM, 1996, pp 3-4.

Cameron, D.W., Hoepfner, D.W., **Invited refereed paper**, "Fatigue Properties in Engineering" ASM Handbook-volume 19, Fatigue and Fracture, ASM, 1996, pp 15-26.

Hoepfner, D.W., **invited speaker**, "Corrosion Predictive Modeling in Aircraft Fleets", NCI Aging Aircraft Meeting, Dayton, OH, March, 1996.

Hoepfner, D.W., "Fretting Fatigue Behavior of Titanium Alloys", Slide Presentation at the United Technologies Engineering Research Conference, Hartford, CT, May, 1996.

Hoepfner, D.W., "Fretting/Fatigue-A Brief Overview", **Invited** Slide Presentation at the United Technologies Engineering Research Conference, Hartford, CT, April, 1996.

Hoepfner, D.W., "Fretting/Fretting Fatigue and Aircraft Joints", **invited keynote speaker**, presentation at the MTS Conference, Tokyo, Japan, April, 1996.

Hoepfner, D.W., "Effect of Test Parameters on the Corrosion Fatigue Crack Growth of Aircraft Structural Materials", **invited keynote speaker**, presentation at the MTS Conference, Tokyo, Japan, April, 1996.

Hoepfner, D.W., "Corrosion and Corrosion Fatigue of Aircraft: Accidents, Incidents, and Progress", **invited keynote speaker**, presentation at the MTS Conference, Tokyo, Japan, April, 1996.

Hoepfner, D.W., **invited keynote speaker**, "Fatigue and Damage Tolerance Issues Related to Engine Structural Integrity", presentation at the MTS Conference, Tokyo, Japan, April 1996.

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Currently writing a book series on structural integrity entitled "Structural Integrity Considerations in Engineering Design", the Contract is with Imperial College Press and World Scientific Press, I am being managed by the World Scientific Press office in Singapore because they intend to translate the books into Asian languages as soon as possible.

Volume I-Introduction to Structural Integrity and Basic fatigue design

Part I - Introduction to Structural Integrity Based Design.

Part II - Fatigue Design Basics. (E.g. Stress Life and Strain Life approaches).

Additional volumes are to be as follows:

Volume II - Introduction to Fracture Mechanics and - "Damage" Tolerant Design based on applying fracture mechanics principles.

Volume III - Corrosion, Environmental Effects on Structural Integrity.

Volume IV - Fretting Wear, Fretting Corrosion, and Fretting Fatigue Effects on Structural Integrity.

Volume V-Thermal Fatigue and Thermomechanical Fatigue Effects on Structural Integrity

Volume VI - The role of Non-Destructive Evaluation and Inspection in Structural Integrity based design.