

Fluid Power Educational Foundation 2007-2008 Annual Report



Fluid Power Educational Foundation

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www.fpef.org

President's Message:

FPEF: Making the Case for Fluid Power Education

by Clayton W. Fryer, FPEF President
Norgren Inc., Mt. Juliet, TN



Over its history, the Foundation had the very good fortune to have passionate Board members guiding the organization. Along with those countless, dedicated volunteers, the Foundation continues to have enthusiastic benefactors, expecting to see continuous improvement in fluid power curricula, contact, and consistency from one Board to the next.

I have the distinct honor of leading this new Board into 2009. Our new Board has many fresh faces, new ideas, and an overwhelming desire to move the FPEF into the future. We expect to accomplish initiatives already underway, to develop a long term educational plan, and to firm up our relationships with other leading fluid power organizations in this industry.

Manufacturing in the United States is in turmoil; fluid power component manufacturers are consolidating, along with fluid power distribution. Industry is seeking talented, educated, and passionate employees. We foresee increasing demand for multi-discipline technicians involved with the design, build, and maintenance of automation. Technical Fluid Power Education will offer new students, educators, and skilled workers continuing, and future, benefits.

Going "GREEN" is all the "buzz" today! Emphasis on energy conservation, reducing green house gases, and using fluid power more efficiently, will gather more support. Major cities in the United States are moving at "warp speed" to be recognized as Green Cities. You should expect to see expansion in Green Buildings,

and Green initiatives from the manufacturing sector, because it is patriotic, and makes "cents"!

Looking beyond the demand side of Fluid Power, where fluid power is used to make, assemble, and package consumer products, there is a developing move to evaluate the "overhead costs" of fluid power, the costs to generate fluid power on the "supply side" for automated equipment. Virtually, every dollar of overhead costs falls to the bottom line, offering financial executives, not the people in the plants, another place to improve profits. Indeed, the bottom line in manufacturing can be improved by analyzing both the supply and the demand sides of fluid power. The U. S. Department of Energy has many programs for energy reduction, using compressors, pumps, etc. Regional power companies are offering incentives to reduce energy costs. Of course, these new opportunities will require additional education initiatives. It will be necessary to make the public sector aware of these initiatives and opportunities.

With the help of our benefactors, contributors, volunteers, and staff, the FPEF will continue to make a case for more fluid power education, especially with the changes we are witnessing today. Serious Fluid Power Education can make a substantial contribution toward reducing our dependence on foreign oil, reducing energy consumption, and reducing the carbon footprint of our industries.

We need your help to continue this work and to identify new fluid power training opportunities. New training opportunities and initiatives will require additional funding. In this economy, we recognize the difficulty to help others, to contribute, donate, and volunteer. Please don't give up on our future scientists, specialists, and technicians that will be educated to apply fluid power. Pitch in to help set the agenda and the future of the Fluid Power Educational Foundation. We ask for your support, your contributions, and your suggestions to provide new direction for the FPEF.

Our Mission: Promoting, Advancing & Supporting Fluid Power Education and Research

FPEF was created to stimulate, advance and support the sciences and technologies of hydraulics and pneumatics in the North America. In pursuit of this purpose, the Foundation supports education and research initiatives that provide meaningful impact to the advancement of the fluid power industry. The Foundation is wholly supported by fluid power industry firms and Associations, which enable FPEF to bring fluid power to students of all grade levels.

Education

Our Mission: FPEF promotes the education of qualified persons in the sciences and technologies of hydraulics, pneumatics and associated technologies and the math and science which supports these fields, through:

- FPEF Key Schools Program, a network of technical colleges, universities, and high schools teaching fluid power
- FPEF Curriculum Resources for Teachers, Administrators
- FPEF Scholarship Program, helping FPEF Key Schools to recruit and graduate over 600 students each year
- Teacher Workshops in conjunction with the MAC Valve Foundation
- Brochures, video and other media highlighting the career possibilities in the fluid power industry



- Funding of IFPS fluid power Certification testing for Key School students
- Coordinated industry support to FIRST Robotics Competition, FIRST Lego League, and FIRST Vex Challenge, bringing hands-on immersion in fluid power design and engineering to over 32,000 high-school students each year
- Grant to Project Lead the Way™ for development and deployment of fluid power curriculum for middle and high schools nationwide
- “Contacts for Employment” listing on FPEF website, providing a mechanism for communication between industry firms and those seeking employment

Research & Experimentation

Promote, advance and support scientific investigation, research and experimentation in the sciences and technologies of hydraulics and pneumatics:

- Support of Engineering Research Center for Compact & Efficient Fluid Power
- Grants to university research labs dedicated to the study of motion control through fluid power



FPEF: Supporting & Promoting Education in Fluid Power

John Naghosian, FPEF Educational Coordinator

Key Schools/Key High Schools



We currently have seventeen key schools at the two year and four year level. Five are four year colleges and twelve are two year schools. These schools are offering fluid power courses in either stand alone fluid power programs, or as a significant part of other programs,

such as Engineering Technology, Industrial Engineering, Automation and Robotics, Electronics Technology, etc. Graduates of these programs are enjoying the options of many career choices, and the demand exceeds the number of graduates. We have two high schools designated as key schools. Both of these schools have programs which are engineering oriented with significant course work in fluid power, automation and electronic controls. Many of the graduates of these schools go on to university programs in Engineering or Engineering Technology.

Scholarships

The Foundation offers three specific types of scholarship programs. The first, which was started by the Foundation years ago, is designed to help students currently enrolled in approved programs within the Key School network. The students fill out applications to the Foundation and the Key professors make recommendations to the educational coordinator, regarding which student should be considered. The second type of scholarship was initiated based on responses

by Key professors to a survey question which asked what additional things the Foundation could do for their programs. They indicated that assistance in recruiting students to their programs would be appreciated. Since effective recruiting can best be done at the local level, the Foundation decided that it would be helpful to offer scholarships to graduating high school seniors in the Key schools' regions who officially enroll in the Key schools program. These students also fill out applications and are recommended by the Key professors. The third and most recent program is designed for graduates of the two Key high schools. These scholarships are intended to help students who go from high school to Engineering or Engineering technology programs at the university level. The thought behind these scholarships is that these graduates have become aware of fluid power as a means of power transmission and consider that as a possible solution when, as Engineers, they decide which system best solves their problem. These students also fill out applications and are recommended by the Key professors.

Curriculum Development/Promotion

The Foundation developed several curriculum guides over the years. The first was a curriculum guide for post secondary institutions. It was intended to be helpful for schools which had no programs in fluid power, and a desire to implement one. Often the faculty which used these guides followed them very closely for the first several semesters and then began to expand using some of their own ideas. This curriculum guide

was developed many years ago, before there was a great deal of material available on the subject of fluid power. There isn't much demand for it today.

A second curriculum was developed for junior high school instructors, as a tool to introduce students to fluid power. It incorporated Lego and integrated some basic science content, so that science teachers could adapt some practical experiences to the theoretical content of their courses. Since Lego discontinued manufacturing the components used in that curriculum, that curriculum is no longer available.

The third curriculum was initiated after the Foundation committed itself to introducing fluid power into high school programs. The Foundation realized if that was to happen, the teachers needed help. We engaged several high school teachers who had very good success in introducing fluid power into their schools, and they developed the curriculum. After the curriculum was finalized, the Foundation solicited manufacturers of pneumatic components to develop a training panel to facilitate fabrication of the circuitry problems in the curriculum. There was only one manufacturer willing to do that. The curriculum can be down loaded, free of charge, on our web site at www.fpef.org. The training panel which was developed is all pneumatic and mechanical. To follow up on this panel, a second panel which is electro mechanical was developed. Both of these panels can be purchased directly from the manufacturers, whose addresses are on our web site.

Lastly, the FPEF along with the Mac Air Valve Foundation has offered several work shops for high school teachers. These workshops have shown teachers how to introduce pneumatics into their programs and how to use the training panels to create interest among their students. Upon completion of the work shops the teachers went back to their schools with a three ring binder with enough materials to conduct a one semester course of study.

It is my hope that the new Board of Trustees will help to expand the number of workshops we offer. My contention is that these Board members are situated at the grass roots level, where they can determine which schools in their community would be potential recipients of our help to bring fluid power related courses into their programs.

In Memoriam

Robert E. Koski, an Honory Trustee of the Fluid Power Educational Foundation and co-founder of Sun Hydraulics Corp., died at home in Sarasota, FL on Oct. 11, 2008.



Koski, 79, founded the Sarasota Hydraulic Cartridge Valve Company in 1970. A mechanical engineer and Dartmouth College graduate, Koski grew the company into a global, publicly held corporation with overseas operations in England, Germany, France, Korea, China and India. He was known for his cultivation of “horizontal management” and created a company culture of employee freedom and self-regulated job responsibility.

FPEF Financial Statement* FY 2007-2008			
BALANCE SHEET			
Cash & Cash Equivalents		\$280,279	
	Net Assets		\$280,279
Liability		\$0	
FPEF Equity, 7/1/07		\$292,076	
Net Revenue/(Expense)		-\$11,797	
	Total FPEF Equity		\$280,279
STATEMENT OF REVENUE & EXPENSES			
Revenue:			
Contributions		\$45,956	
Interest Income		\$7,702	
	TOTAL REVENUE		\$53,658
Disbursements:			
Investment in Education-			
Scholarships & IFPS Certifications		\$17,455	
Fluid Power Education Program Development		\$25,805	
Fluid Power Education Program Support		\$4,418	
	Total Program Expense		\$47,678
Expense:			
Administrative Expenses-			
Insurance, Legal Fees, Audit		\$6,552	
Administration		\$11,225	
	Total Administrative Expense		\$17,777
	TOTAL EXPENSE		\$65,455
	Net Revenue/(Expense)		(\$11,797)
*Unaudited Figures-Audited figures will be supplied upon request.			

FPEF Advances Fluid Power: Support of Engineering Research Center for Compact & Efficient Fluid Power

The National Science Foundation Engineering Research Center for Compact and Efficient Fluid Power (CCEFP) is a network of researchers, educators, students and industry working together to transform the fluid power industry—how it is researched, applied and studied. Center research is creating hydraulic and pneumatic technology that is compact, efficient, and effective. The CCEFP’s education and outreach program is designed to transfer this knowledge to diverse audiences—students of all ages, users of fluid power and the general public.

The CCEFP is a National Science Foundation Engineering Research Center, established in June 2006. In addition to its grant from NSF, the Center is supported by its seven participating universities and 59 industrial partners, including the Fluid Power Educational Foundation.

Until this Center was established, the U.S. had no major fluid power research center (compared with thirty centers in Europe), and fluid power researchers, who were previously disconnected, are now linked through the CCEFP. A team of 35 faculty—each with

distinguished academic records, unique and cross-disciplinary interests, and representing seven leading universities—is engaged in work on 22 research projects and five test beds. These projects are organized in three thrusts that achieve the following societal benefits:

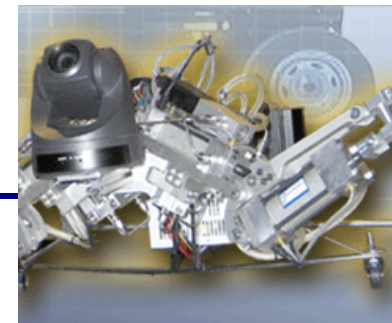
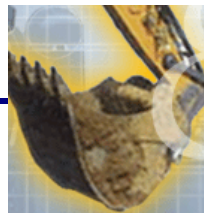
- improved efficiency: significantly reducing petroleum consumption, energy use and pollution;
- improved effectiveness: making fluid power clean, quiet and safe for its millions of users; and
- improved compactness: exploiting its attributes in a new generation of devices and equipment—or those that increase mobility for an aging population, for autonomous rescue and service robots needed in our complex world, and for enabling fluid-powered portable hand tools.

The Center’s Education and Outreach program fills a long-recognized need. Despite fluid power’s ubiquitous presence as an industry enabler, hydraulics and pneumatics instruction is relatively scant as compared to other technologies. But the CCEFP is now transferring knowledge about fluid power and the

work of the Center to diverse audiences—students of all ages, users of fluid power and the general public. Some of these programs are focused on STEM (Science, Technology, Engineering, and Mathematics) education with examples drawn from fluid power when appropriate, while others are specific to fluid power and its application.

The Fluid Power Educational Foundation has supported the CCEFP since its proposal stage. Today, industry organizations support the Center with funding and in-kind donations. Through its committees and conferences, project mentoring, internships, and a host of other projects and individual contacts, the CCEFP is a forum that not only facilitates knowledge transfer between academia and industry but also a growing appreciation of each other’s culture. These emerging partnerships will be among the Center’s key legacies.

The seven universities included in the CCEFP are Georgia Tech, Illinois, Minnesota, MSOE, North Carolina A & T, Purdue University, and Vanderbilt University.



FIRST Robotics Competition Brings Hands-On Fluid Power Experiences to High Schools Across the World

FPEF serves as the fluid power industry's liaison to *FIRST* (For Inspiration and Recognition of Science and Technology) and provides coordinated support from the industry to the annual FIRST Robotics Competition.

Through FPEF's financial support and the coordination of component donations, training resources, and a website dedicated to supporting *FIRST* teams who use pneumatics, every *FIRST* Robotics Competition team receives a kit of pneumatics components which are used to construct a robot to perform multiple tasks based on a specific "game" designed each year by FIRST engineers.

What does this mean for the fluid power industry?

It means that FPEF is coordinating resources to bring hands-on fluid power experience to:

- Over 37,500 high-school students on 1,501 teams competed in 41 Regional competitions (in the U.S., Brazil, Canada, and Israel) and the Championship.
- Worldwide outreach: *FIRST* Teams hail from 50 US states, 4 Canadian provinces, and an ever-expanding number of nations including Brazil, Israel, Mexico, the UK and the Netherlands



During the 2008 Robotics Competition Season, 41 Regional Competitions led to the National Championships at the Georgia Dome. In addition to a number of awards recognizing not only technical excellence but also "gracious professionalism," over \$10 million in college scholarships were awarded to FIRST team members.

New Key School Added to FPEF Key School Network

Henry Ford Community College, Dearborn, MI

The Electrical Technology program at HFCC offers an Associate in Applied Science degree, which includes required courses in Basic Hydraulics, Pneumatics, Automation Controls & Robotics, and more. Laboratory instruction (about 50% of class time) teaches the use of test equipment, setting up circuits, trouble shooting, and calibrating systems. The Electrical Technology facilities are state-of-the-art offering the high-tech training necessary to prepare you for job success in today's economy. Working conditions are simulated in five fully-equipped laboratories where students put electrical-electronics theory to practice. Along with hands-on lab experience, computer-simulated circuit analysis is used in most of the electronics courses.

Students must complete a minimum of 62 credit hours of study for the Associate in Applied Science degree consisting of required core, required support, and general education courses. To graduate, the student must fulfill the Computer Literacy requirement either by successfully completing one of the Computer Literacy courses (listed in the General Education course requirements) or by passing the Computer Literacy Test.

FPEF Welcomes Henry Ford Community College to the Key School network. As an FPEF Key School, HFCC can offer scholarships to high school students entering its Electrical Technology program, as well as scholarships for current students to enable them to continue their education, and can take advantage of the network of 20 colleges, universities and high schools offering fluid power educational programs.



Thank You, FPEF Contributors

FPEF is supported entirely through tax-deductible, charitable donations from fluid power industry manufacturers, distributors, supporters and benefactors. Without this support, none of the FPEF programs would be possible. We sincerely thank and recognize our loyal donors and urge your continued support.

Diamond Donors (\$2,500 and over)

Bimba Manufacturing Co., Monee, IL
Brand Hydraulics Co., Inc., Omaha, NE
International Fluid Power Society, Cherry Hill, NJ
PIAB Vacuum Products, Hingham, MA

Gold Donors (\$1,000 to \$2,499)

Main Manufacturing Products, Grand Blanc, MI
Parker Hannifin Corp./Parker Hannifin Foundation, Cleveland, OH
PHD, Inc., Fort Wayne, IN
Robert E. & Marie E. Kraft Family Fund, Savannah, GA
Sun Hydraulics Corporation, Sarasota, FL
SunSource, Addison, IL
Womack Machine Supply Co, Farmers Branch, TX
World Wide Fittings, Inc., Niles, IL

Silver Donors (\$500 to \$999)

Air Logic, Racine, WI
AZ Hydraulic Engineering Inc., Kingman, AZ
Flodyne/Hydradyne, Hanover Park, IL
G. W. Lisk Company, Inc., Clifton Springs, NY
Hartfiel Company, The, Eden Prairie, MN
HydraForce, Inc., Lincolnshire, IL
Pacific PowerTech, LLC, Portland, OR
Power Systems, Div. H.E.B. LLC, Chanhassen, MN
Ronald Hickman, Baldwin, MI
TECO Pneumatic Inc., Pleasanton, CA
The FPDA Motion & Control Network, Cherry Hill, NJ
Webster Instruments, Milwaukee, WI

Bronze Donors (\$250 to \$499)

Action Automation & Controls, North Attleboro, MA
Buckeye Rubber & Packing Co., Beachwood, OH
ControlAir Inc., Amherst, NH
Groot Family Foundation, Inc., The Knotts Co., Basking Ridge, NJ
Haldex Hydraulics Corp., Rockford, IL
Hydac Corporation, Lehigh Valley, PA
J.H. Bennett & Co., Inc., Novi, MI
John Henry Foster Minnesota Inc., Eagan, MN
Kraft Fluid Systems, Inc, Strongsville, OH
Master Pneumatic-Detroit, Sterling Heights, MI
Numatic Engineering, Sun Valley, CA
Price Engineering Co., Inc., Hartland, WI
Ralph A. Hiller Co., Inc., Export, PA
RHM Fluid Power, Inc., Westland, MI
Schroeder Industries, Leetsdale, PA
The Knotts Co., Inc., Berkeley Heights, NJ
Yates Industries Inc., St. Clair Shores, MI

Patrons

Hydro Air, LLC., North Haven, CT
Control & Power, Inc., Birmingham, AL
Controlled Motion Solutions, Santa Anna, Ca
FCI Automation, Grand Rapids, MI
Fluid Power Sales Inc., Baldwinsville, NY
Hydrotech, Inc., Cincinnati, OH
Monarch Hydraulics, Inc., Grand Rapids, MI
Mosier Fluid Power of Ohio, Miamisburg, OH
Ohlheiser Corporation, Newington, CT
Poclain Hydraulics, Inc., Sturtevant, WI

Patrons continued

Progressive Hydraulics, Inc., Saddle Brook, NJ
R. L. Miller Inc., Pittsburg, PA
R. M. Wright Co., Inc., Farmington Hills, MI
Ralph W. Earl Co., Inc., Syracuse, NY
Roessel & Co. Inc., Rochester, NY
Triad Technologies LLC, Englewood, OH



Support the Future of the Fluid Power Industry: Your Source for Tomorrow's Employees and Customers

Your charitable, tax-deductible donation to the Fluid Power Educational Foundation will enable future student scholarships, curriculum development and deployment, and outreach efforts to engage more people in fluid power technology and training. Help prepare skilled employees and knowledgeable customers by supporting FPEF.

Donations to the Fluid Power Educational Foundation are acknowledged on the FPEF website as a deserved recognition of their generosity. Donors may also choose to be listed in the online "Contacts for Employment" resource at www.fpef.org.



FPEF Key Schools

Each FPEF Key School offers a fluid power technology department or courses in fluid power as part of an engineering or sciences program or department.

Annual FPEF Scholarships to students entering or continuing fluid power coursework at Key Schools are supported by donations from the fluid power industry, which benefits from a better-trained workforce for the future. Contact FPEF for information about any of the FPEF Key Schools.

Key Schools – Colleges & Universities:



Alexandria Technical Institute

Alexandria, MN

Todd Zarbok, toddz@alx.tec.mn.us
320-762-4608

Two-year AAS; Two-year diploma in Fluid Power Technology and Manufacturing Engineering Technician

FPEF Scholarships Awarded:

Joshua Boogaard
Ben Lapatke
Dustin Karl
Wade Wilke

Angelina College

Lufkin, TX

www.angelina.cc.tx.us

George Davis, Fluid Power Instructor
gdavis@angelina.edu
936-633-5443

Fluid Power Technology - Associate of Applied Science
Fluid Power Technology - Level 1 Certificate

FPEF Scholarships Awarded:

Brance Wall

Centennial College of Applied Arts & Technology

Scarborough, Ontario

www.cencol.on.ca

Donald Wang, Coordinator, Automation & Robotics

dwang@centennialcollege.ca
416-289-5000

Electro-Mechanical Engineering Technician - Automation & Robotics two-year diploma program; Electro-Mechanical Engineering Technology - Automation & Robotics; Electro-Mechanical Engineering (Co-op) Technology - Automation & Robotics three-year diploma program

FPEF Scholarships Awarded:

Hooman Samani
Zhiyuan Xie

Hennepin Technical College (Eden Prairie)

Eden Prairie, MN

www.htc.mnscu.edu

Ernie Parker, Fluid Power Instructor

Ernie.Parker@htc.mnscu.edu

952-995-1569

AAS Associate in Applied Science Degree - Fluid Power Engineering Technology; Fluid Power Engineering Technology Diploma; Fluid Power Mechanic Diploma; Industrial Maintenance Mechanic Certificate

FPEF Scholarships Awarded:

Nick Bernard
Timothy Verret, Jr.
Zachery Mithaugen
Zach Rohloff

Hennepin Technical College (Brooklyn Park)

Brooklyn Park, MN

Bill Martin, Professor

Bill.Martin@hennepintech.edu

763-488-2484

Industrial Maintenance Mechanic Certificate; Fluid Power Mechanic Diploma

FPEF Scholarships Awarded:

Brett Riske
Hung Pham

Henry Ford Community College

Dearborn, MI

Alan Essenmacher, Instructor

AEssenme@hfcc.edu

586-242-6330

Associate Certificate program in Electronics Technology.

University of Maine at Orono

Orono, ME

www.ume.maine.edu/bre

Thomas E. Christensen, Associate Professor & Program Coordinator

thomas.christensen@umit.maine.edu

207-581-2717

Four-year B.S. Mechanical Engineering Technology and Electrical Engineering Technology with Fluid Power options within the MET and EET degree programs; Four-year Biological Engineering, Mechanical Engineering and Engineering Physics with Fluid Power electives.

Key Schools – Colleges & Universities:

Milwaukee School of Engineering

Milwaukee, WI
 www.msoe.edu
 Tom Labus, Professor Mechanical Engineering Dept.
 labus@msoe.edu
 414-277-7284

Four-year B.S., Mechanical Engineering Technology with Fluid Power Courses; 18 credit fluid power option in the BS Mechanical Engineering Technology Program. 12 credits of fluid power electives in BS Mechanical Engineering Program. 9 credits fluid power specialty in MS Engineering Program. In addition, MSOE's Fluid Power Institute conducts contract research projects in fluid power and related motion control areas for Component manufacturers, OEM's Distributors, Users and Government Agencies. It employs undergraduate and graduate students from various degree programs in conjunction with faculty from various departments to work on the projects.

FPEF Scholarships Awarded:
 John C. Vacca - Otto Maha Scholarship
 Stephen A. Vossen

Minnesota West Community and Technical College

Granite Falls, MN
 Jim Fischer, Fluid Power Lead Instructor
 fluid.power@mnwest.edu
 320-564-4511

Fluid Power Technology: AAS degree and two year Diploma; Robotics/Flexible Automation: AAS degree and two year Diploma; Manufacturing Engineering Technician - AAS degree; customized training for the industry.

FPEF Scholarships Awarded:
 John Gramentz - High School Scholarship (approved 11/18/2008)
 Antony Mackedanz - High School Scholarship (approved 11/18/2008)
 Carter Brandt - FPEF Scholarship



Mohawk College of Applied Arts and Technology

Stoney Creek, Ontario
 Doug Daniels, Fluid Power Instructor
 doug.daniels@mohawkcollege.ca
 905-575-2531

Mechanical Engineering Technician - Fluid Power Automation; Manufacturing Engineering Technician - Automation - Industrial Mechanic; Two Year Technician Diploma (with an optional one year co-op internship).

North Dakota State College of Science

Wahpeton, ND
 James Aakre, Instructor, Diesel Technology Department
 james.aakre@ndscs.nodak.edu
 701-671-2144

Industrial Maintenance - AAS Degree;
 Diesel Technology - AAS Degree

FPEF Scholarships Awarded:
 Evan Miller
 Bryan Burkhartsmeier
 Cody Sibson

Ohio State University - Wooster

Wooster, OH
 ati.ag.ohio-state.edu
 John Arnold
 330-264-3911

Ohio State ATI's Fluid Power program provides a balanced curriculum consisting of technical and general courses, as well as practical experience. The Associate of Applied Science degree requires successful completion of a minimum of 102 quarter credit-hours of technical and general studies. The technical courses include the study of fluid power components, electro-hydraulics, technical graphics and CAD, and instrumentation. The comprehensive curriculum also includes the study of power transmission, digital electronics and technological problem solving. A minimum of 51 hours are required in technical courses. Fluid Power students also complete 51 hours of general studies which include written and oral communication, social sciences, mathematics, and chemical and physical science.



Oklahoma State University

Stillwater, OK
Young B. Chang, Associate Professor
ybae@okstate.edu
405-744-7019

Four-year B.S., Mechanical Engineering Technology with Fluid Power Emphasis; four-course sequence in fluid power: Basic Hydraulics, Pneumatics, Applied Fluid Mechanics, Electro-hydraulics and Motion Control.

FPEF Scholarships Awarded:

Drew Smith
Derek Evers
Joey Peterson

Purdue University/Mechanical Engineering Technology

West Lafayette, IN
www.purdue.edu/abe
Steve Widmer,
sewidmer@tech.purdue.edu
765-494-7527

B.S. in Ag Systems Management; MS and PhD in Agriculture; School of Technology: Two-year A.A.S. or four-year B.S., Mechanical Engineering Technology.

Purdue University/Agricultural Engineering

West Lafayette, IN
www.purdue.edu/abe
Gary Krutz, Director, Electrohydraulic Center
krutz@purdue.edu
765-494-1179

B.S. in Ag Systems Management; MS and PhD In Agriculture; School of Technology: Two-year A.A.S. or four-year B.S., Mechanical Engineering Technology.

FPEF Scholarships Awarded:

John Andruch
Timu Gallien

San Joaquin Delta College

Stockton, CA
Richard Dettloff, Fluid Mechanics Instructor
rdettloff@sjdccd.cc.ca.us
209-954-5537

Two-year Certificate in Fluid Power Technology & Associate of Science in Fluid Power Technology; Fluid Power support courses are offered in other technical programs, such as auto mechanics, diesel, electrical, industrial technology, machine shop, welding, and agriculture mechanics Certificates.

Spokane Community College

Spokane, WA
www.scc.spokane.cc.wa.us
John Norman,
jnorman@scc.spokane.edu
509-533-7118

Two-year Associate, Fluid Power Technician.

FPEF Key High Schools

Birmingham Seaholm High School

Birmingham, MI
Bernie Simms, Instructor
bs03bps@birmingham.k12.mi.us
248-203-3771

FPEF High School Scholarships Awarded:

Mark Davison
Wayne Olsen

Toledo Technology Academy

Toledo, OH
Bob Sintobin, bsintobin@tps.org

FPEF High School Scholarships Awarded:

Christopher Hileman

“As always, the number of jobs available far exceeds the number of graduates. The demand is so high this year that the starting wages have risen considerable. Our struggle continues to be getting more students into our Hydraulic and Pneumatic Automation Technology program.”

Robert Williams, Spokane Community College

“Every course I have taken pertains to the job I will have working in the fluid power industry.”

Ted March, Student

FPEF Educational Resources

Curriculum Guides

FPEF's curriculum guide, *Introduction to Pneumatics with Circuit Design Problems*, helps high school teacher learn about the basic concepts of pneumatics. It presents 10+ real world problems in pneumatic fluid power automation and is designed to be used in conjunction with a pneumatic trainer that demonstrates the principles and circuits outlined in the curriculum. Additional information about the curriculum guide and pneumatic trainers is available at www.fpef.org

This curriculum was developed by two engineering technology teachers at Seaholm High School in Birmingham, Michigan. Both have been involved in previous FPEF sponsored activities including teacher training sessions and developing and presenting unique methods of integrating fluid power applications into science and technology courses.



Other Curriculum Guides

Fluid Power in Integrated Motion Control Technology, A Suggested 2-Year Post High School Curriculum is available to help instructors develop or enhance coursework in fluid power, and is geared toward grades 9 through 12.

Another guide, *Integrating Pneumatics into the Science Curriculum*, was developed by instructors at Seaholm High School and is geared toward grades 6 through 9. Both are available from www.fpef.org. Educators who seek to establish fluid power programs are also directed to our Educational Coordinator for assistance.

Ordering Information:

For more information or to order any of these resources, contact: FPEF Administrator at 856-424-8998 or Email: info@fpef.org

Careers Brochures

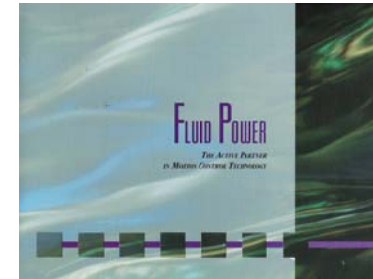
An attractive color brochure, *There may be a career waiting for you in Fluid Power!* Explains and illustrates the potential for fluid power careers in aerospace, agriculture, automation, construction, recreation and biomedicine. Complimentary copies are available to students, schools, businesses, and libraries.

Industry Contacts

Contacts for Fluid Power Industry Employment is collection of potential employers in the fluid power industry and include contact information such as company name, divisions, areas of employment specialization and names of employment contacts compiled with the assistance of our contributors. It is available at www.ifps.org



Discovering Fluid Power: Hydraulics and Pneumatics at Work in Your World – A Kit of Resources



People in the fluid power industry, educators, and middle and high school students are now exploring fluid power principles with the help of this resource kit to complement the video/CD, *Discovering Fluid Power: Hydraulics and Pneumatics at Work in Your World*. The kit of resources is a natural extension of the video that was processed through the cooperative efforts of FPEF, FPDA NFPA, and IFPS.

Also included in the kit is an 18-page brochure, *Fluid Power; the Active Partner in Motion Control Technology*, and a full color pamphlet, *There may be a career waiting for you in Fluid Power!*

The FPDA Motion & Control Network

When the founding members of the Fluid Power Distributors Association (FPDA) began the organization in 1974, they originally envisioned fluid power distributors coming together for the benefit of addressing common business concerns. Today, this original vision is still paramount – and after 34 years of evolution, growth, and success, FPDA’s commitment to the future of the fluid power and motion control industry and to our members is clear in the services we provide and the programs we sponsor, as The FPDA Motion & Control Network.

Education for Fluid Power & Distribution

FPDA supports FPEF through an annual financial donation that provides funding for a wide range of services and activities that turn “kids to customers,” including the FIRST Robotics Competition, the FPEF Key School Scholarship program, and the continued development of fluid power curriculum materials for all educational levels. FPDA’s Executive Director also serves as an Association Liaison to the FPEF Board of Trustees.

FPDA educational conferences are also held twice a year, in the spring and in the fall, for the benefit of FPDA membership. It is at these meetings that members have the unique advantage of choosing the direction for their association, their companies, and their industry.

FPDA’s Education & Human Resources Committee works with FPEF and on special projects to bring skilled and educated individuals into the fluid power

industry. FPDA supports the Industrial Careers Pathways® program which brings industrial distribution coursework to community colleges and technical schools to produce better-rounded graduates who are ready to step into a new career path in industrial distribution including fluid power.

Developing the Industry’s Next Generation

With an eye on the future of the industry, FPDA’s Young Executives Symposium (YES) brings together young, corporate level executives and strives to better prepare them for their future executive roles in the fluid power industry. YES sponsors presentations on a variety of topics in conjunction with the FPDA conferences, as well as telephone and web-based training and education programs. YES members have the opportunity to share information with industry peers and to network for professional development by discussing similar management challenges and solutions with other young executives in the industry; to participate in YES-Sponsored educational programs designed specifically for professional development and advancement. There are no member fees or attendance requirements.

Industry Information & Benchmarking Data

FPDA group reporting services also help members benchmark their operations and profitability against others in the industry. Our reports are respected in the industry because our members have direct input as to what data is collected and analyzed. FPDA offers three programs specific to fluid power distributor operations benchmarking:



- The “Industry Snapshot Survey,” a monthly index of sales, orders, and inventory valuation
- The annual PROFIT Report, a financial benchmarking report covering the five critical profitability variables for fluid power distributors
- The biennial Industry Compensation Report, indexing compensation and benefit practices among fluid power distributors as well as the wholesale distribution industry across thirty different lines of trade.

With our membership comprised of fluid power and motion control distributor, manufacturer, and service provider companies worldwide, The FPDA Motion & Control Network is one of the most diverse groups in the fluid power industry. In joining FPDA, our members show that they are also dedicated to making a positive difference in the fluid power and motion control distribution industry for the success of their business. FPDA is proud to support the efforts of the Fluid Power Educational Foundation for the future of the industry.

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International Fluid Power Society (IFPS)

The International Fluid Power Society (IFPS) is a professional organization of individuals dedicated to enhancing the quality and numbers of certifications, educational opportunities, technology transfers, and professionalism within the fluid power and motion control industry. Founded in 1960, the IFPS is a non-profit organization anticipating the celebration of its 50th Anniversary at the 2010 Annual Meeting in Philadelphia.

Beginning with the first Fluid Power Hydraulic Specialist Certification in 1980, the IFPS became the recognized industry leader in Certifications. Fourteen different Certifications are currently offered with complete information about them available at the web site: www.ifps.org As of fall 2008, there are nearly 10,000 active IFPS certifications throughout the United States and in many countries around the world. These certifications cover job descriptions within the industry including mechanic, technician, specialist, and engineer.

Additionally several Master Level Certifications are available for those who follow certification paths either within a specific discipline or within a certification level.

Certification

Once again leading the way within the fluid power and motion control industry, in early 2009 IFPS will release the Fluid Power Electronic Controls Specialist Certification. This certification will verify knowledge in the important skill set of electronic control of fluid power. IFPS recognized this application area had become the most important new technology within our industry and put the certification on a fast track for development and release. The study guide for the FPECS certification should be available soon.

Newly under development is the IFPS Mechatronics Certification. This particular certification should have broader appeal than any of the individual certifications currently offered, as it will be pertinent to industrial, mobile, user, OEM, distributor, and manufacturer markets. Nearly everyone employs Mechatronics, multi-tasking or multi-talented employees. This new Mechatronics Certification will enable employers to verify the skills of these employees. If all goes well, the Mechatronics Certification will be fast tracked also and could be released as early as first quarter 2010.

Professional Development

As part of its primary mission, the IFPS offers educational programs both online and on-site. The most utilized study programs are the Certification Review Sessions offered for each of the certification tests. These can be easily coordinated by contacting IFPS headquarters at 1-800-308-6005. Also available is general on-site education in electronics, hydraulics, and pneumatics which can be customized to suit your particular machines or equipment if desired. The most accessible training is the online training – some is available for no cost and other more extensive training is obtained for a fee which depends on your IFPS membership status.

The IFPS strongly supports the Fluid Power Educational Foundation and has given the FPEF significant financial support during the last few years. The Key Schools are an important part of the FPEF's work and the IFPS works closely with the Schools and both their scholarship and student membership programs.

The IFPS Board of Directors made a significant donation to the Fluid Power Education Foundation to establish the Raymond Hanley IFPS Certification En-

dowment Fund. The purpose of the endowment is to focus on additional training for IFPS Accredited Instructors. Assuring that our Accredited Instructors have the opportunity to learn new technologies means that across the country, industrial students learn and benefit from certified seasoned professionals who are equipped to train based on the newest innovations within the industry.

In addition to the FPEF, the IFPS works closely with other industry associations including the NFPA and the CFPA to insure that the IFPS maintains its lead role as the professional society for individuals in the fluid power and motion control industry. IFPS also meets regularly with these other organizations to explore new ideas such as global certifications and international certification reciprocity.

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National Fluid Power Association (NFPA)

National Fluid Power Association (NFPA) is committed to providing meaningful support to further the understanding and advancement of motion control through fluid power and its applications. The association's 340+ members represent all fluid power channel partners: manufacturers, distributors, suppliers, customers and educators. Following are examples of association programs developed in support of education:

Engineering Research Center for Compact and Efficient Fluid Power (CCEFP)

NFPA is supporting the CCEFP that was funded with \$15 million from the National Science Foundation, \$3 million in combined donations from participating companies and \$3 million from participating universities. The Center's vision is to create new fluid power technology that is compact and efficient, leading to significant fuel savings as the new technologies are implemented in existing and new applications.

NFPA Education and Technology Foundation

The Foundation supports programs that actively engage students at all grade levels in learning about fluid power; encourage the development of new teaching resources: fluid power labora-

tories as well as on-line, in-print and hands-on instruction tools; support research in motion control through fluid power at the two-year, four-year and graduate school levels; and foster ongoing forums between educators and industry so that ideas and priorities of mutual interest can be shared and set.

Giving Program

NFPA and its Foundation are committed to supporting programs that encourage research and teaching activities in fluid power through gifts and grants, awarded primarily for projects that foster the study of motion control technology for students from middle through graduate school—"hands-on" teaching activities, senior capstone projects, student competitions, development of teaching tools, etc. Together with its Foundation, 55 gifts have been awarded along with matching funds in support of fluid power laboratories and curriculum development. Grants are awarded to support fluid power-related research.

Educator/Industry Summits

Our Summits, held biennially, have brought academia and industry together to share ideas and plan for successful partnerships.

Fluid Power Challenge

The NFPA Fluid Power Challenge is a program designed to provide Middle School students with information about fluid power technology and hands-on experience building a fluid power mechanism with real world applicability, as well as opening their eyes and those of their teachers to the world of engineering and fluid power careers. NFPA hopes to encourage students to select more mathematics and science courses in their high school curricula to keep their options open for technology-based post-secondary studies.

Workforce Development Resource Center

The Workforce Development Resource Center offers information and links to resources such as Web-based training, certification courses, training aids and professional education seminars to help strengthen the fluid power workforce. Visit www.nfpa.com and click on the Workforce Development Resource Center icon.

"Fluid Power: A Force for Change" public TV program

"Fluid Power: A Force for Change" is a fascinating exploration of the fluid power industry and its positive effects on our current and future society. This

30-minute television program, with industry leaders, researchers, educators and students sharing their perspectives, also showcases the promise careers in fluid power hold for a rising generation of young engineers looking for exciting and socially responsible careers. The program was developed by the National Fluid Power Association in cooperation with fifteen other fluid power organizations from around the globe, and produced by Twin Cities Public Television. For more information about the video or to view the program on-line visit www.nfpa.com.

NCFP Technical Conference

The NCFP Technical Conference is organized by the National Conference on Fluid Power (NCFP), one of NFPA's standing committees. The 52nd NCFP Technical Conference will be held during IFPE, the International Exposition for Power Transmission, scheduled for March 22-26, 2011 in Las Vegas in conjunction with CONEXPO-CON/AGG.

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FPEF: Advancing Fluid Power Education & Careers

The mission of the Fluid Power Educational Foundation is the stimulation, advancement and support of sciences and technologies of hydraulics and pneumatics in the United States of America, Mexico, and Canada. In pursuit of this purpose, the Foundation:

Fosters the education of qualified persons in the sciences and technologies of hydraulics, pneumatics and associated technologies, through:

- FPEF Scholarships
- FPEF Key Schools Program
- FPEF Fluid Power Curriculum Resources
- FPEF Teacher Workshops
- FPEF website (www.fpef.org)
- Support of the FIRST Robotics Competition
- Support of "Project Lead The Way"
- IFPS Certification Reimbursements for FPEF Key School Students

Promotes, advances and supports scientific investigation, research and experimentation in the sciences and technologies of hydraulics, pneumatics and associated technologies:

- FPEF Supports the National Science Foundation-funded Engineering Research Center for Compact and Efficient Fluid Power
- Support of new labs dedicated to the study of motion control through fluid power

**Support the Future of the Fluid Power Industry:
Your Source for Tomorrow's Employees and Customers**

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