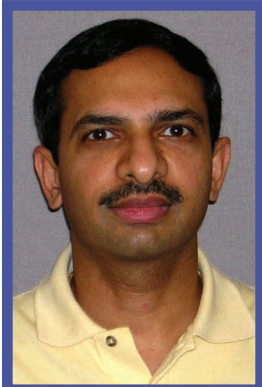


## Message from the Chair



Sanjay Mistry, Ph.D

**I**t gives me great pleasure to write this message as incoming chair of Fluid Power Systems and Technology (FPST) division. I would like to take this opportunity to thank outgoing chair, David Edeal, who has done a great job handling numerous tasks associated with this position and guiding this division towards the path of growth. Also I would like to thank all FPST members who put in umpteen numbers of hours getting things going for this division. I feel confident

that our members would continue to provide the excellent support they have been providing in the past. I look forward to working with all of you in the next two years during my tenure as FPST division chair.

In spite of various environmental challenges we have been enjoying steady growth in membership. Total primary membership in the FPST division as of end of July 2003 has been 695. The membership has been steadily increasing over the last several years. The primary membership was 627 in 1999 that has increased to 695 in 2003. This represents a steady growth of almost 11% during the last four years.

We are also pleased with the increasing activity of our FPST members. Examples include increased participation in our Executive Committee meeting at the November 2003 Congress and quarterly teleconferences. The quarterly teleconferences have helped executive committee members keep in touch with the latest activities and developments in the FPST division and ASME.

The FPST technical program at 2003 IMECE shows that even with growing competition for academic materials from other venues, our division continues to produce valued academic content. A total of 29 papers were presented in six technical sessions, including one FPST/DSC joint session. For 2004 IMECE, we have received record number of abstracts and based on which we have asked conference committee for two additional sessions. This is truly a sign of our good reputation and result of commitment from our members.

Last year David Edeal and myself spent a significant amount of time in developing a draft of our strategic plan. Based on our strategic plan, we have formed two new committees - Journal Committee and Conference Committee. The members of the Journal Committee are:

- Rich Burton (Committee Chair)
- Noha El-Ghobashy
- Noah Manning
- Monika Ivantysynova.

The goal of Journal Committee is to identify any issues related with developing a joint journal with FPNI, assess the opportunity and recommend course of action.

The members of the Conference Committee are:

- Dean Kim (Committee Chair)
- David Edeal
- Eric Barth
- Michael Goldfarb.

The goal of the Conference Committee is to assess and rank various opportunities in order of most likely for success; and help FPST in planning a joint or mini conference. Both of these committees will provide at least quarterly update reports during our teleconferences.

The members of Best Paper Award Selection Committee are:

- Rich Burton (Committee Chair)
- Dean Kim
- Noah Manning

In addition to these committees, we are also planning to have number of technical committees, for which I would like to solicit members. If you are interested in running a technical committee or being a part of specific committee, please contact Dean Kim and myself about it.

In summary, FPST Division has made a steady growth since its inception and has now become a solid and well established division as a part of the Systems and Design Group. During the last year special atten-

*continued on page 2*

### *FPST Newsletter Spring 2004* *Editor: Noah Manning*

<i>Message from the Chair</i>	<b>1</b>
<i>Rich Burton Elected to the Grade of Fellow of ASME</i>	<b>2</b>
<i>2004 TEC Attendance Report</i>	<b>2</b>
<i>A Glimpse at FPST's Strategic Planning</i>	<b>3</b>
<i>Get Involved with the Future Direction of the FPST Division</i>	<b>3</b>
<i>2003 IMECE/FPSTD Best Paper Awards</i>	<b>4</b>
<i>FPST Division Executive Committee</i>	<b>4</b>
<i>Water Hydraulics Laboratory in Cracow University of Technology</i>	<b>5</b>
<i>The Rolf Fluid Power Laboratories</i>	<b>5</b>
<i>Pioneers of Fluid Power</i>	<b>6</b>

## Message from the Chair

*continued from page 1*

tion has been given to strategic planning and improving member communication. We are actively seeking to establish closer ties with other more industry-oriented organ-

izations such as SAE, FPNI and NFPA. Currently, our division is sound and healthy gaining steady momentum. Our executive committee members are very much dedicated to improve and expand our division activities. As always,

I welcome any comments and suggestions for improvements from our members. ■

Respectfully submitted,  
Sanjay Mistry, Ph. D.  
Chair

MistrySanjayI@JohnDeere.Com

## Rich Burton Elected to the Grade of Fellow of ASME



*Professor Rich Burton*

Professor Rich Burton has been elected to the grade of an ASME Fellow. Since the inception of the Fluid Power Systems and Technology Division of ASME, Rich Burton has served the Division with strength and commitment. Professor Burton's outstanding achievements have been noted throughout the Division by his scholarly activities and his coordination of international activities for Fluid Power research and education. Here are a few of the comments that have been offered by his colleagues:

"I consider that his [Rich Burton's] contributions have advanced the state of the art in several specific areas within the field. Richard regularly presents papers in the international arena and is a fluent, enthusiastic and stimulating speaker."

"The impact of Dr. Burton's work has been observed on an international scale in his active involvement with Fluid Power researcher's around the world. In this capacity, Dr. Burton has provided tremendous leadership as he has helped to form an international awareness of this field."

"What I appreciate most about Rich is that even though he could be considered a seasoned academician with a secure stature in his field, he continues to exhibit the same kind of enthusiasm found in professors trying to establish themselves early in their careers. This is true whether Rich is participating in a committee meeting debate or presenting a paper in place of one of his students."

"The Fluid Power community, from students to industry, have benefited already by the actions of Dr. Burton. His tireless efforts to keep the FPSTD active and connected have been noticed by all of his peers ..."

"Dr. Burton has played an instrumental role in taking fluid power education and research from North America continent to the global international arena. His expertise is well recognized in both Europe and ASIA."

Congratulations to our friend and colleague! Professor Burton may be reached using the following contact information: Dr. Richard Burton, Assistant Dean of Undergraduate Studies and Professor of Mechanical Engineering, College of Engineering, University of Saskatchewan, 57 Campus Drive, Saskatoon SK S7N 5A9, Canada, Phone: (306) 966-5473, Email: richard\_burton@engr.usask.ca. ■

## 2004 TEC Attendance Report

The ASME Technology Executives Conference (TEC) is an annual event that provides Council on Engineering (COE) leaders and key committee personnel with the information they need to manage successfully the affairs of their ASME units. The COE held its annual 2004 TEC (a Division Leadership Training conference) at the Hyatt Regency in Pittsburgh, on March 5-7, 2004. The conference also provides an opportunity for the interchange of ideas to affect changes in Society operations consistent with ongoing changes in the engineering workplace. The Conference was well attended with representation from all 37 Technical Divisions.

Sanjay Mistry, Chair, and Dean Kim, Vice Chair, both of FPST division, attended this conference as FPST representatives to enhance their understanding of ASME's activities and interact with ASME staff and leaders of other units. Both participants attended the general sessions. Sanjay also attended "Senior Leaders Track" while Dean attended "First Timers Track". The First Timers Track is designed to enable incoming leaders to guide ASME units and the Senior Leaders

Track is designed to gain the synergy of senior leaders to unveil best practices useful in unit planning and operations. The presentations can be viewed at <http://www.asme.org/tec/presentations/index.html>.

A successful addition to the program this year was the Division Poster Session. Each Technical Division displayed a poster highlighting its current products, services, and best practices. This session provided opportunity for delegates to discuss their thoughts about other division posters on display and explore common division activities. Delegates were expected to learn new ways to better market their strengths to members, gain new ideas from other divisions and find common interests with divisions that may mutually benefit from partnerships. Posters from all divisions can be viewed from <http://www.asme.org/tec/presentations/index.html>.

Overall, both participants felt that the conference was useful and enlightening; and look forward to utilizing concepts learned to help our division to thrive in this changing environment. ■

## A Glimpse at FPST's Strategic Planning

One of the most important things to understand about strategic planning is that it will never really be complete. This is not an easy thing for most of us project oriented folks to accept, but the fact is that the institutions and industries we work in are a constantly evolving. If we are to thrive in this environment, we must also be prepared for change.

The first step in the strategic planning process is self-assessment. Before you can figure out where you want to go, you need to figure out who you are, where you've been and what you're capable of. In the process of taking a critical look at our division, we have become aware of a number of important characteristics and issues that influence our activities:

- While many ASME Divisions are struggling to maintain their membership, the FPST Division continues its steady growth. The number of paper submissions from Division members has also increased dramatically as has the circulation of the FPST newsletter. All this has occurred while the Fluid Power industry is supposedly in decline.
- Based on the amount of fluid power research being done in both Europe and Asia, it is apparent that worldwide, the industry is healthy and growing. A renewed emphasis on optimized system solutions appears to be providing the fuel that is motivating researchers to continue to nurture what has often been considered a mature industry.
- While there are nearly 600 primary and nearly 5000 total FPST Division members, there are only 8-10 active committee members that perform the bulk of the Division volunteer work. This severely limits the Division's ability to organize and plan for events and activities outside of its current limited scope. In order to provide more services and expand our Division's influence, more volunteer support is needed.
- The IMECE Congress is the Division's primary conference event. Anywhere from one half to two thirds of the papers presented in FPST sessions at this conference are from authors outside of North America. At the same time, none of the Executive Committee

members or core volunteers are from outside of North America.

A draft of the Division's strategic plan was developed after carefully considering these and a number of other factors such as FPST's origins, our strengths and weaknesses, as well as our varied activities and opportunities. A key component of any strategic plan is the mission statement or strategic intent.

*The FPST Division's strategic intent is to develop more products of superior value and the high quality our customers have come to expect through entrepreneurship and partnership and by operating in a professional and fiscally responsible manner.*

Once the Division assessment and strategic intent have been completed, it is possible to develop sensible, effective operational strategies and tactics like the ones mentioned in this newsletter. One important issue that surfaced during our strategic planning was a proposal to broaden the Division's focus beyond fluid power systems. It has been suggested that the future health of the division can be ensured by expanding our emphasis beyond fluid power. The thought being that if the Division were to change our emphasis to *Actuation Systems and Technology*, we might better serve the changing needs of industry as a whole including, but not limited to, the fluid power industry. By taking into account what we learned from the self assessment and strategic planning process, it became clear that such a radical Division change would be premature if not impossible. Instead our primary strategy will be to focus our efforts on identifying and effectively pursuing a small number of high potential product and partnership development opportunities.

The FPST Executive Committee believes that strategic planning is not just an exercise performed for ASME's sake, but a key ingredient in plotting the Division's future course. We are committed to completing the strategic planning process in order to ensure the FPST Division's future success. ■

### Get Involved with the Future Direction of the FPST Division

Do you feel like you are not getting what you want from the FPST Division? Are you dissatisfied with the division's current agenda? Do you feel that our communication is inadequate and our direction unclear? Do you feel underrepresented? Would you like to see the Division involved in more events and activities? Would you like to play a role in the future direction of the Division? Can you offer just a few of hours a month to support YOUR Division? If you've answered yes to any of these questions, then your opportunity to make a difference is here right now.

The FPST Division is now in the process of developing our strategy and structure to address the needs of its broad range of industry and international customers. Volunteer support is needed for strategic planning activities as well as the development of new partnerships, events and services. If you are interested in playing a role in creating our Division's future, please contact an executive committee officer for more details.

## 2003 IMECE / FPSTD Best Paper Awards

At the 2003 International Mechanical Engineering Congress and Exposition (IMECE), two papers presented in the FPSTD sessions were awarded the Best Paper Award. Abstracts of these papers are given as follows:

**“Wear Measurements of a Large Hydraulic Fluid Power Pump using Radioactive Tracer Wear Technology”**  
**Martin Treuhaft, Suzanne Timmons, Douglas Eberle & Glenn Wendel, Southwest Research Institute, San Antonio TX**

Real-time wear measurement is possible in fluid lubricated components utilizing radioactive tracer technology (RATT). This technology has been applied to internal combustion engines since the 1950's, but has only recently been applied to hydraulic components. This paper presents the application of radioactive tracer technology to measure wear rate of pistons and slippers in a large variable displacement, high pressure, axial piston pump under various operating conditions. To apply this technology, new piston and slipper assemblies were exposed to thermal neutrons in a nuclear reactor to produce characteristic radionuclides (isotopes) in the slippers and pistons. These isotopes act as tracers, which when worn off in an operating pump can be measured by monitoring the gamma-ray activity in the circulating fluid. The accumulation of wear particles in the unfiltered circulation loop is monitored continuously as the pump is operated under various transient and steady state conditions. The steady state wear rate is determined by the rate of accumulation of radioactive wear particles in the loop over a period of time, usually less than a few hours. This first time application of RATT for wear analysis in a large hydraulic pump has shown positive results. This technology can be applied to determine wear sensitivity of hydraulic pump parts for an endless array of factors, such as speed, pressure, displacement, temperature, contamination level and composition, and duty cycle. Break-in, start-up, and transient wear affects can also be observed. Comparisons can also be made between the wear of different design features and materials.

**“A Multi-Objective Sliding Mode Approach for the Energy Saving Control of Pneumatic Servo Systems”**  
**Khalid Al-Dakkan, Eric Barth & Michael Goldfarb, Vanderbilt University, Nashville TN**

This paper proposes a variation on a sliding mode control approach that provides significant energy savings for the control of pneumatic servo systems. The control methodology is formulated by first decoupling the standard four-way spool valve used for pneumatic servo control into two three-way valves, then using the resulting two control degrees of freedom to simultaneously satisfy both the sliding mode sliding condition and a dynamic constraint that minimizes airflow. The control formulation is presented, followed by experimental results that indicate significant energetic savings with essentially no compromise in tracking performance relative to a standard four-way spool valve approach. Specifically, relative to standard four-way spool valve pneumatic servo actuator control, the experimental results indicate energy savings of 27 to 45%, depending on the desired tracking frequency.

The sessions that were hosted during this meeting are given in the following table:

2003 IMECE, Nov 15-21, 2003, Washington, D.C. FPST Program Representative: Saeid Habibi			
Session No	Session Title	Organizers	Number of papers
1	Analysis, Design and Control of Fluid Power Pumps	Noah Manring & Suzanne Timmons	4
2	Design, Analysis and Control of Fluid Power Systems	Saeid Habibi & Dan Robinson	5
3	Modeling, Simulation and Analysis of Fluid Power Systems	B. Surgenor & Noah Manring	5
4A	Fluid Power Panel Session - The Way Forward	David Edeal & Rich Burton	Panel Discussion
4B	Fluid Power Systems, Control and Analysis	Dean Kim	5
4C	Fluid Power Control - Joint DSC/FPST Session	Perry Li & Eric Barth	5
5	Analysis, Design and Control of Fluid Power Valves	Richard Burton & Perry Li	5

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**Please visit the following websites for future conference information:**  
[www.asmeconferences.org/nmw2005](http://www.asmeconferences.org/nmw2005) & [www.conferencetoolbox.org/wtc05](http://www.conferencetoolbox.org/wtc05)

## Water Hydraulics Laboratory in Cracow University of Technology

In September 27, 2003 the faculty of Mechanical Engineering at Cracow University of Technology (CUT) conducted a first seminar on the "Application of Water Hydraulic Drives in Machines and Devices". It was organized by the Institute of Heavy Duty Machines in cooperation with Sauer-Danfoss-Poland. The seminar was opened by the dean of Faculty of Mechanical Engineering, Prof. Stanisław Michałowski. It was also an opportunity to summarize researches conducted in the Institute within a framework of project No 8 T 07C 052 20 State Committee for Scientific Research. Representatives of interested water-hydraulic companies, research centers, universities and students took part in this seminar. Four papers were presented dealing with ecological aspects of applying water hydraulics in industry. Examples and applications of water hydraulics in different branches of industry were presented as well as available components for water hydraulic system from Danfoss-Nessie, Denmark.

Furthermore in the Section of Power Systems and Automation of Heavy Duty Machines there was presentation of the high pressure water hydraulic test bench, the first in Poland. It was built within the framework of the project and with financial support of Danfoss. Also results of experimental tests of water hydraulic drive system were presented. The participants underline an ecological aspect of using water as working fluid in drive and control systems of machines and devices in various branches of industry: food, pharmaceutical, agriculture, forestry and municipal. They also point out the necessity of introducing ecological water hydraulic drives to teaching programs and purposefulness of organizing cyclic seminars, conferences or workshops deal with those problems.

Questions may be addressed to: Dr. Andrzej Sobczyk, e-mail: [sobczyk@mech.pk.edu.pl](mailto:sobczyk@mech.pk.edu.pl), URL: <http://astra.mech.pk.edu.pl/~sobczyk> ■

## The Rolf Fluid Power Laboratories

Over the past six years, the College of Engineering at the University of Missouri - Columbia (UMC) has been actively pursuing support for the development of a Fluid Power program in both education and research. The results of this effort have been the development of an undergraduate and graduate course in Hydraulic Control Systems, the graduation of over 15 graduate students in Fluid Power, and over \$1M in Fluid Power research expenditures.

Recently, UMC has received significant funding for strengthening its research and educational programs in Fluid Power. The funding stream began with a generous donation of \$500k from Randy and Sandra Rolf for increasing Fluid Power activities at UMC. Based upon this donation, the Festo Corporation donated another \$250k toward establishing an endowed professorship in Fluid Power, and the National Fluid Power Association (NFPA) contributed another \$50k for supporting student research activities. Due to the matching contributions of Festo and NFPA, the Rolfs have made an additional \$1M planned gift for supporting the Fluid Power laboratories at UMC. The total contributions toward Fluid Power activities at UMC have now reached \$1.8M - a handsome sum for producing lasting-benefits for the Fluid Power industry.

The donated funds for Fluid Power research and education will be used for increasing the experimental capabilities at UMC, for supporting an endowed professorship in Fluid Power, and for supporting student research activities at the graduate and undergraduate levels. For more information concerning the ongoing work at UMC in Fluid Power, and for learning more about your own participation in these activities, please contact Professor Noah Manning at (573) 882-7539 or send an email to [ManringN@missouri.edu](mailto:ManringN@missouri.edu). UMC extends its appreciation to those who have made these activities possible! ■



*Signing ceremony  
for the Rolf donations  
in Fluid Power.  
Left to right:  
Sandra Rolf,  
James Thompson  
(Dean of the College  
of Engineering),  
Randy Rolf.*

## Pioneers of Fluid Power

Dr. Paul Ukrainetz, a native of Saskatchewan, Canada has been active in the fluid Power area for over 40 years. Paul received his BE (University of Saskatchewan) in 1957, his M.Sc. (University of British Columbia) in 1960 and his PhD (Purdue University) in 1963. He has worked with British Aircraft Limited, Purdue University, Columbia Cellulose Co., and Birmingham University before (and during) his tenure with the University of Saskatchewan in which he was a Professor of Mechanical Engineering until his retirement in 1999. He is now a Professor Emeritus with the Department where he keeps an active interest in the Fluid Power research group. Paul also was Department Head of the Mechanical Engineering Department from 1974–1983.

Paul has supervised over 40 M.Sc. and 15 PhD students over his busy career. He has four Chapters in selected books on Vibrations and Fluid Power, 37 refereed Journal Papers and over 100 papers in refereed conferences proceedings. Some of his earliest research studies were on valve design, Pulse Width Modulation and Electro-Hydraulic servo valves. He has held many research Grants and research Contracts. He has also been on most organizing committees of international conferences around the world. Amidst frequent trips to visit his three sons and his many grandchildren, Paul finds time to assist graduate students write their thesis and to sit on graduate students advisory committees.

Dr. Peter Nikiforuk, was Dean of the College of Engineering, University of Saskatchewan from 1973 - 1996. Peter started the Fluid Power Laboratory in 1960 and has been a key player in maintaining the Fluid Power group as a viable research group for over 40 years while many other Fluid Power research programs have come and gone. He received his B.Sc. (Queens University) in 1952, his Ph.D. (Manchester), in 1955 and his D.Sc. (Manchester) in 1970. He has worked with AV Roe Ltd., Defence Research Board and Canadair Limited, before joining the College of Engineering in 1960. Aside from serving as Dean, he was also the Head of the Mechanical Engineering Department. Peter retired in 1997 and is now Dean Emeritus and Professor Emeritus of the College of Engineering.

Peter is a Fellow of seven distinguished Societies and Institutes and has served as a Board member of many National and International Committees and Councils. Peter has co-authored over 375 journal papers in the most prestigious Journals in the world. He has supervised over 90 Ph.D. and M.Sc. students in the Control and Fluid Power areas and even though he has retired, he continues to hold research grants and to supervise graduate students. Peter and his students have carried out many research studies on the application of modern and intelligent controls theories to hydraulic systems. ■

[www.asme.org/divisions/fpst](http://www.asme.org/divisions/fpst)

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**Fluid Power Systems  
& Technology Division**

