



## FES, Inc와 BarDyne, Inc

미국 Oklahoma주, Stillwater에 있는 FES, Inc와 BarDyne, Inc의 사장이면서 오кла호마주립대학의 교수인 대담객의 Dr. Ing T. Hong을 인터뷰하였다.

대담 · 김태권교수(계명대학교)



교수이면서 기업가인 Dr. Hong은 산업의 신뢰성을 향상 시키기 위한 엔지니어링서비스와 전산화된 엔지니어링의 중요성을 강조하고 있다.

Director, Q1:

Would you give us a brief history of FES and BarDyne, Inc. and describe your role as a professor?

The roots of FES, Inc. and BarDyne, Inc. date back to the early 1960's when Dr. E. C. Fitch and his talented staff first started providing various consulting and independent component assessment services for the fluid power industry at Oklahoma State University's Fluid Power Research Center. When Dr. Fitch retired from OSU in 1987, he moved FES, Inc. to our current location and we acquired the assets of the Fluid Power Research Center. Since then, our facilities and our capabilities have grown. Currently, both companies are operated under the guiding hand of Dr. Ing T. Hong, while Dr. Richard K. Tessmann serves as Vice President for both companies. A talented staff of project engineers and technicians experienced in

applied research, development, and testing activities complete the organization.

FES, an acronym for "Fluid Engineering Services," is an Oklahoma corporation authorized to perform a broad range of professional services for organizations throughout the world. FES has been fortunate in acquiring from the Fluid Power Research Center, and other testing laboratories, a full spectrum of test facilities which were specifically designed and qualified to perform technology development and integrity assessment work. Currently housed in a 15,000 sq. foot building, FES, Inc. is prepared to serve the technology needs of any company in the fluid power industry. FES, Inc. does not offer a hardware-type product for sale. Instead we offer services that are based not only on our long years of involvement with the fluid power industry, but also on the creativity and engineering talents of

our technical staff. FES' wide range of technical services includes the following:

- Component Performance Evaluation
- Life and Reliability Testing
- Component Contaminant
- Sensitivity Approval
- Fluid Analysis Evaluation
- Filtration Performance Assessment
- Mathematical Model Evaluation
- Technical Consulting

BarDyne was formed in 1989 to handle the increasing amount of research and development activities that were coming from the industry. BarDyne's worldwide activities include the following:

- Applied Research and Development Contracts for In Industrial and Organizations
- Lecture and Seminar Presentations
- System Design and Software Development
- Technical Book Publications

In 1993, BarDyne introduced the HyPneu system design and analysis software which soon became a major focus of BarDyne's activities. In 1995, the HyPneu for Windows program was released and sales to major U.S. and international companies increased dramatically. Currently, HyPneu can count among its many customers companies such as Ford Motor Company, General Motors Company, Vickers, Martin Marietta, Oak Ridge National Labs, Korean Aerospace Agency, Taiwan Aerospace Development Center, China Steel Company, and Japan Tokico Ltd.

My role as Adjunct Professor at Oklahoma State University has helped me to keep in touch with the future of our industry. I offer fluid power control courses

at both Mechanical & Aerospace Engineering as well as Bio-system and Agricultural Engineering. Many of my students have gone forward to seek careers in automotive, aerospace, and other industries all over the world.

#### Question Two

What are the main goals of FES and BarDyne?

FES and BarDyne have been organized to serve parallel segments of the Power and Motion industry. The primary thrust vector assigned to FES is engineering services including component and system testing, design consulting, and trouble shooting. On the other hand, BarDyne is directed toward computerized engineering including design analysis and modeling, software development, and analytical trouble shooting. Assisting the Power and Motion industry to clearly define such parameter as component and system dynamic response, contamination control optimization, component efficiency, and system reliability is a main goal for FES. BarDyne is striving to help the Power and Motion industry to reduce system development time and costs through computerized engineering. BarDyne has developed software called "HyPneu" that is capable of analyzing any Power and Motion type of system.

#### Question Three

What major programs have you had in the past that have helped you meet your business goals?

Automotive Hydraulic Components and System Design

- Brake System
- Suspension System
- Power Steering System
- Radiator Heat Transfer Analysis
- Lubrication System
- Fuel Delivery and Vapor
- Management System

## Aerospace and Combat Vehicles

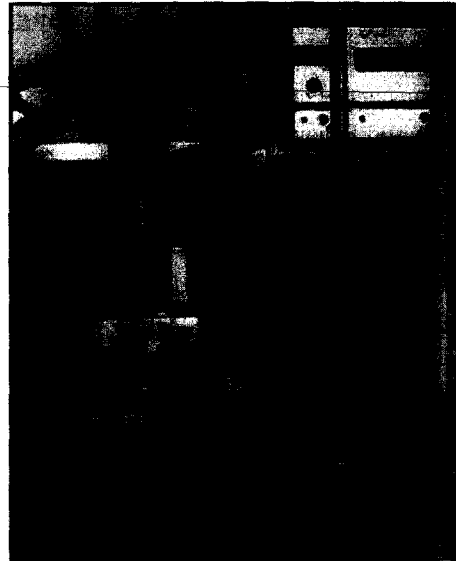
- Jet Fighter Hydraulic Control System
- Trainer Plane Hydraulic Control System
- Landing Gear System
- Trouble Shooting of Airplane
- Hydraulic System
- Retrofit Emergency System
- Missile Control System
- Space Shuttle Fluid System
- Helicopter Servo System
- Combat Vehicles Reliability Study
- Combat Vehicles Maintenance Design
- Submarine Low Noise System Design
- Amphibious Vehicle Design and Analysis

## Precision and Heavy Industrial Hydraulic System

- Steel Mill Maintenance Program
- Construction Machinery Reliability Study
- Fork Lift Stability Study
- High Precision Machinery Design and Analysis
- Nuclear Waste Management Robot
- Retrofit Design
- Factory Automation System Design and Analysis
- Wind Power System Retrofit Design
- Intelligent Pump Design
- Pump Endurance Life Study

## Conclusion

There are many important fields in Automotive



▲ Test for Lubrication and Wear

Engineering?

The automotive industry will continue to concentrate on fuel efficiency due to the depletion of fossil fuels and the necessary reduction in emissions. In addition, there can be little doubt that alternate fuel will also be a hot issue due to the same reasons. The control systems capable of increasing fuel economy and decreasing emissions are very complex requiring the use of a Virtual Laboratory as found in the HyPneu program. Life and reliability will consume a good deal the development effort expended by the automotive industry in the future.

Contamination control in steering systems, anti-skid braking systems and suspension system will be very active areas.

While the automotive industry has conducted research and development on

various variable assist steering system, no one system seems to be the best. This situation leads to opportunity in the development of more reliable and quieter variable assist steering systems.

Technical manpower will be focused on the noise and vibration associated with steering systems. The automotive customer is strong opposed to steering system which vibrate and make offense noises when turning a corner.

The future activities in the automotive will be associated with the projects that produce longer life and greater reliability as well as higher quality product. Automotive Companies in the future will continue to search for concepts that will produce better ride while saving money. The people of the world are becoming more and more mobile and their life style will depend upon a more reliable, high quality, safer, quieter, cheaper automobile.

Question Five

What do you think of the Korean engineering personnel working in the automotive field from the standpoint of research, development, and application?

It is very difficult to generalize concerning the technical people in any field of endeavor. However, it is very evident that the Korean Automotive Industry has become a major factor in the world. This can only be attributed to the creativity, ingenuity, and resourcefulness of their technically trained personnel. It would appear, however, that the engineering staff in Korean could use a little help in the use of computerized techniques. Modeling has

taken a considerable amount of time in the past. Today, tools can be employed to reduce this time and produce a better product using less cost. Training on the use of these tools should be a major effort in the Korean Automotive Industry.

One of the most important factor in the improvement of life and reliability in any engineered system is contamination. Contamination can consist of particles, air, water, chemicals, etc. The control of these deleterious aspects of system operation must be a major application activity. Here again training seems to be the factor most needed by the Korean technical community.

Question Six

What are the visions and prospects for your companies?

We have spent the last few years developing a position for both FES and BarDyne in the Power and Motion Industry. We are now in a position to lead the industry in technical training, seminar publications including text type books, computerized engineering, and engineering services. We have a customer base that covers many of the Pacific Rim countries as well as European companies. Of course, we enjoy a very large base in the United States. In the foreseeable future, we will continue to be the leader in our chosen areas of expertise.

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