

FRONTIER-KEMPER CONSTRUCTORS, INC.

# CROSSCUT

**Wilson County Holdings**  
Fredonia Underground Drilling Facility



# Frontier-Kemper Safety



The Evansville Shop & Yard crew celebrated 2,000 days (5 years) without a Recordable Incident in September 2014.

## Welcome to a special edition of the Crosscut!

In this issue, we recognize and congratulate two groups within the Frontier-Kemper family who have achieved and maintained excellence in safety performance and production.

With continued focus on resource-based safety programs, such as Work Area/Mobile Equipment Inspection, Stretch and Flex, and JHA's-FK employees at the Evansville Shop and Yard and Wilson County Holdings (Fredonia) Project have ingrained safety into key components of success, obtaining significant milestones.

Evansville Shop and Yard-2000 Days Worked Without a Recordable Incident (568,812 hours) 5 Years.

Wilson County Holdings (Fredonia)- 568 Days Worked Without a Lost-Time Accident (155,409 hours) 1 Year Duration of Project.

While both work sites experienced near-hit incidents, they were thoroughly investigated in order to determine root cause-with lessons learned applied to task planning activities, then effectively communicated in safety meetings and Job Hazard Analysis. As you view photographs of some of the Team Members who achieved these milestones, please remember how they got there.

### Take five minutes to plan your work.

It might be the most important five minutes of your day. They could be the most important five minutes of your life.

"Safety First, Last, and Always"

**George W. Zugel, CMSP**  
**Corporate Safety Director**

# Letter from the President



Dave Rogstad – President & CEO

As we move into 2015, I am struck by the feeling that last year was a transitional year for Frontier-Kemper. We had a number of long-term employees retire during the year—representing well over a hundred years of FK experience; but we also retired some of our old-thinking and means and methods—putting into service a lot of new gear and new ideas. You will read about some of those changes in the articles contained herein. Additionally, we upgraded our drilling-and-blasting and robotic shotcrete equipment to the newest technology available for our latest tunnel and underground powerhouse project in British Columbia. We will employ new equipment with the latest innovations for a couple of Microtunnelling projects in Las Vegas in 2015. We have upgraded and modernized the mechanical and electrical designs of our FK-Lakeshore hoisting products.

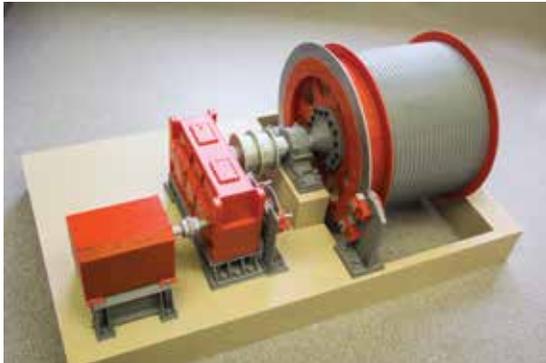
The dramatic financial events of 2008 led to some painful market changes in the Mining and Civil arenas that we compete in and ushered in lower commodity prices and demand along with increased foreign competition. The fact that we have been able to succeed throughout these changes is a testament to the many fine people within Frontier-Kemper, both new and old, that embrace the need to change and modernize to be more efficient. Coupled together with the strong financial backing of our shareholder, Tutor Perini, and their winning competitive culture behind us, we look forward to 2015 with great optimism.

**Dave Rogstad**  
**President & CEO**

# People, Projects, & Ingenuity

## FKC-Lake Shore Division

### 3D Printing



FKC-Lake Shore's 20-ton Service Hoist installed at Gibson South scaled to a 1/24 3D-printed model.



FKC-Lake Shore recently partnered with students and faculty from the University of Southern Indiana Center for Applied Research and Economic Development (CARED) to bring our product line to life through scaled, 3D-printed models. The purpose of creating these models is to provide our customers with a hands-on experience that portrays a more accurate representation of FKC-Lake Shore equipment.

A good deal of research was put into this project by both FKCI and USI. 3D printing has some limitations and restrictions on what will and will not print. Jeremy Davis, CAD Designer in the EVV Engineering Department, manipulated and "over exaggerated" thicknesses and clearance spaces on existing 3D CAD models for the 3D model to print with functioning, rotating parts. The image above shows Gibson South's 20-ton Service Hoist with a rotating Drum at a scale of 1/24.

Kallie Shappell, FKCI Multimedia Specialist, and Alexander Flick, USI Engineering student, worked together to find the most cost-effective solution for printing the Service Hoist. Breaking down the components and printing in several different pieces reduced print time and the amount of material used; vs. printing the model as a complete assembly. Finishing touches included sanding, painting, and assembly. FKC-Lake Shore will begin showing our 3D-printed products at our 2015 trade shows.

## Mining Division

### Barrick South Vent Raise



Frontier-Kemper makes history again with a new, US record for the largest, single-pass, full-face, Blind-Drilled Shaft. This drilling feat was accomplished on February 20, 2014 with the completion of the South Vent Raise Shaft at Barrick Gold's, Cortez Mine in Crescent Valley, Nevada. The Blind Bore Drilling Team was able to successfully drill a 16-ft. diameter shaft at 1,634 ft. deep.

The drill was set up on a collar that had already been excavated to a depth of 128 ft. by Frontier-Kemper. The collar section was excavated with a diesel excavator and lined with steel liner plates, ring steel, and backfilled with grout. The completed shaft was excavated to a total depth of 1,762 ft. The shaft, both collar section and drilling, were completed in under 18 months.

Frontier-Kemper overcame challenges that are notoriously inherent in the Northern Nevada area. Including geologic formations of up to 35,000 psi with steep beddings. These formations are known for creating difficult environments for shaft sinking due to ground support issues and potential for fluid loss. The cutting head of the Shaft Boring Machine was reconfigured to perform in these challenging conditions and outfitted with Herrenknecht Hard Rock Cutters.

The project was able to uphold an admirable safety record. The project worked 68,061 man hours without a lost time accident. Frontier-Kemper was honored to become classified by Barrick Gold as a "Triple-Zero" contractor. Going "Triple-Zero," as it is known at Barrick, is zero lost time injuries, zero medical treatment injuries, and zero fatalities. This accomplishment is uncommon and difficult to achieve, especially over a duration of 18 months.

Congratulations and thanks to everyone involved in the project including Charlie Ernst and his drilling team, Dave Brickey and the engineering group, the MWDO shop staff, and the Barrick Gold Cortez project management team.

The success of a project of this complexity has established Frontier-Kemper as the premier large-diameter, shaft-drilling contractor in the US.

# People, Projects, & Ingenuity

## Civil Division

### 09.04 Seymour-Capilano Pipe Installation

The Frontier-Kemper team working at the Twin Tunnels Completion Project in North Vancouver, BC was challenged with the installation of two, 3.0m ID pipelines within an 11.1m-diameter, 180m-deep shaft. The pipelines had to be constructed with 6.0m steel pipe segments ranging in thickness from 20mm to 12mm. The majority of the pipes were provided with three circumferential stiffener rings ranging in widths and thicknesses from 175mm x 20mm at the bottom of the shaft to 125mm x 20mm at the top. The pipelines were to be encased in concrete for the full height of the shaft.

To meet the schedule, both pipelines were to be installed simultaneously, and backfill had to occur shortly after.

A full custom rigging, lifting and positioning system was attached to the rings. Three hydraulic jacks were included in the system to connect the top ring of the lower pipe to the bottom ring of the upper to-be-installed pipe. A walkway was also encompassed within the top ring to provide safe access to the jacks and the exterior of the joint. Jacks attached between the two rings allowed for keeping the two pipes securely connected and for a precise fit-up during installation.

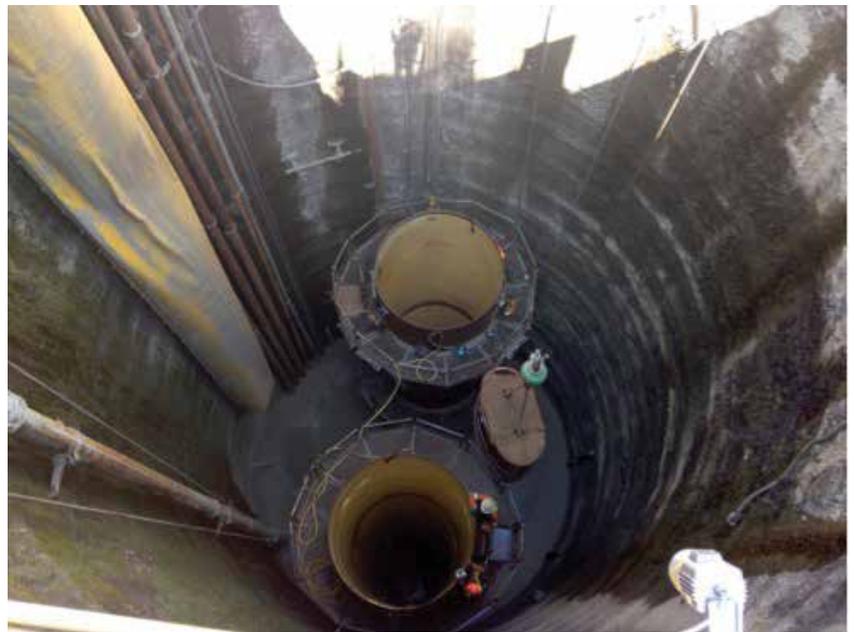
One work cycle included handling the pipe on site, transporting the steel pipe down the shaft to the location of installation, positioning and securing the pipe, welding the joint and concrete backfill placement.

The pipes were installed as single sections, with one pipe being installed on each pipeline before any welding or backfill work took place. The Terex would pick and lower the pipe into position using a custom lifting system that was rigged to the exterior work platform. A crew would follow the pipe down the shaft in a man basket handled by a second crane, a Linkbelt 70-ton mobile. Once the pipe was down to within a suitable distance of the previously set pipe, the crew would land on the previously placed concrete backfill and climb up the exterior ladder. Three custom hydraulic cylinders were connected between the two pipes to take the weight of the pipe, which would al-

low for the rigging to be removed and returned to surface. The crew would return to surface and follow the second prepared pipe down the shaft and repeat the process for the second pipeline.

Once the pipe was fit up, the joint was welded on the inside from the 3 stage work deck. The weld was AUT tested and signed off by a certified inspector. Simultaneously during welding operations, the shaft was prepared for concrete placement and the shaft space outside the previously set pipes was filled with concrete delivered via a 12-in. drop line from surface. Approximately 500m<sup>3</sup> of encasement concrete was required for each lift and the concrete was left approximately 8 ft. below the welding joint for that shift in case any joint welding repairs were required. The installation and encasement concrete cycle was organized to take place in a single day utilizing two shifts to accomplish the cycle.

The installation was successfully concluded without accidents in August 2014. Approximately 15,000m<sup>3</sup> of concrete was batched and placed to backfill the shaft. The Frontier-Kemper crew is now one step closer to the end of the project.





# WILSON COUNTY HOLDINGS

## Fredonia Underground Drilling Facility

### Contributed By:

**KYLE WOOTON & MATT BAUER**

In March of 2013, Frontier-Kemper began construction of the Fredonia Facility in Fredonia, Kansas. The Fredonia project is one of the most unique and innovative projects FKCI'S Mine Development Division and FK-Lake Shore have undertaken. Frontier-Kemper was contracted by Wilson County Holdings (WCH) to construct an Underground Drilling Facility to access oil reserves. Frontier-Kemper worked closely with Brierley Associates throughout the project. The facility is a new concept for oil production, and the construction has relied on FKCI's diverse fleet of equipment and employees.

### The facility is comprised of:

- A Main Access Shaft
- An Underground Drilling Gallery
- An Emergency Escape /Ventilation Shaft
- A Tunnel Connecting The Two Shafts
- A Permanent Headframe And Hoisting System
- The Hybridized Ventilation/Emergency Hoisting System

### MAIN ACCESS SHAFT

The Main Access Shaft was constructed using Frontier-Kemper's traditional, shaft sinking equipment. FKCI is uniquely qualified to construct the facility due to the ground conditions, water inflow, and hydrocarbon gases associ-



MAIN ACCESS SHAFT: Typical pre-grouting manifold set up on Shaft floor.



MAIN ACCESS SHAFT: Shaft walls shown after excavation stabilized by grouting program.

ated with the oil reserve. The entire project was constructed using pneumatic equipment. No diesel or electric-powered equipment was utilized underground. Using MSHA permissible equipment, Frontier-Kemper used the Drill-and-Blast method to excavate and concrete-line the Main Shaft. This posed unique challenges due to the facility's location. The facility is located on the edge of the town of Fredonia, KS. Across the street from the project is an aerospace components factory that could not tolerate any vibrations associated with the blasting. FK used innovative blasting techniques and products to prevent any disruption to the factory and surrounding community.

### THE DRILLING GALLERY

The Main Shaft "bottoms out" into the facility's Drilling Gallery. The Drilling Gallery is a large, round room that will provide an area for WCH's drills to drill horizontally into the oil reserves, and ultimately, house the piping systems used to collect the oil. Excavating the gallery in the oil-rich "pay zone" provided unique challenges. FKCI successfully utilized an extensive grouting plan to grout ahead of the excavation and seal off the salt water, oil, and gases during excavation. After the excavation, a unique series of ground support and a sealing system were installed to maintain the structural integrity of the excavation and keep the salt water, oil, and gases out of the gallery for the life of the facility. FKCI relied on the long-term expertise of its employees and pneumatic equipment (commonly used in coal mine development) to accomplish this task.

### TUNNEL

The tunnel was constructed using Drill-and-Blast methods and posed similar challenges as the gallery excavation. FKCI was able to utilize cushion-blasting techniques to build a smooth walled tunnel that did not compromise the grouting curtain protecting the excavation from the conditions associated with the oil bearing zone. The tunnel will be utilized by WCH as a corridor that houses the mechanical/electrical componentry used to transport the oil to the surface, a manway to the bottom of the escape shaft, and a ventilation air course.

### EMERGENCY ESCAPE/VENTILATION SHAFT

The Emergency Escape/Ventilation Shaft was excavated using the Robbins 7SP Raise Boring Machine. The cuttings were transported through the tunnel to the Main Shaft for removal during the shaft reaming. Frontier-Kemper's innovative field staff was able to handle the cuttings with minimal impact to other critical path activities oc-



DRILLING GALLERY: Matt Bauer prepares the airtrack for installation of the ground support.



TUNNEL: Crews set screeds in preparation for invert pour in.



EMERGENCY ESCAPE/VENT SHAFT: Reamer head is attached and raised to start reaming the Emergency Escape Shaft.



**EMERGENCY ESCAPE SHAFT:** First piece of casing is lowered into the Emergency Escape Shaft.



**ESCAPE HOIST:** Emergency Escape Shaft with Hoisting System and Dual Fan with air lock.

curing simultaneously in the gallery. The Escape Shaft is lined with a steel liner that was installed using a large capacity crane and a hydraulic chairing system designed by FKCI's Engineering department. On the surface of the Escape Shaft, a two-fan, redundant, Ventilation System and an Emergency Escape Hoisting System was installed. These systems were integrated with a creative design that allows the emergency escape capsule to pass through an air lock and allow WCH to use the Emergency Escape Hoist without disrupting the ventilation flow through the facility.

**HOISTING SYSTEM**

The final component of the Fredonia facility is the Hoisting System. Complete with Service Hoist, Personnel Hoist, Headframe, Collar Deck, Controls, and Installation, the hoisting system at WCH is an integral component of the operation. The distinct design of the system and ancillaries underpins WCH's and FK-Lake Shore's commitment to the use of groundbreaking technology at the Fredonia facility.



**HOIST INSTALLATION:** Permanent Material Handling Winch and Service Hoist installation

Another facet of the success achieved at the Wilson County Holdings project is found in the safety performance. From the planning stages, the project utilized key procedures such as Job Hazard Analysis, Stretch and Flex, and Work Area/ Mobile Equipment Inspection programs. The resultant cultural change has forged a stronger team—with improved communications and problem solving. These benefits extend beyond safety performance and resulted in a positive impact upon overall efficiency. At the time of this writing, the Fredonia Project has worked a total of 548 days without a Lost-Time Accident. This represents the best incident rate in the history of Frontier-Kemper's Mine Development Division.



**HEADFRAME:** Permanent Headframe and Collar Deck installation

# Years of Service



Bob Lehman, Machinist at the EVV Shop, accepts his 35-year Service Award from CEO, Dave Rogstad. Thank you for 35 years of hard work and dedication to Frontier-Kemper, Bob!



Albert Macke, Manager of Job Cost at the Midwest Division Office, celebrated 40 years of service on 9/23/2014. Congratulations on 40 years, Albert!

## 40 YEARS

Albert Macke	Accounting	9/23/2014
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## 35 YEARS

Bob Lehman	EVV Shop	8/27/2014
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## 25 YEARS

Brent Downen	Estimating	1/5/2014
Dan Bohleber	EVV Shop	4/5/2014
Chuck Hoelting	Purchasing	12/21/2014

## 20 YEARS

Rich Raab	NEDO	12/20/2013
Tom Berger	CM006	8/29/2014
Russell Allen	EVV Shop	11/14/2014

## 15 YEARS

Mark Barchet	FKC-Lake Shore	3/15/2014
Johnnie Keen	CONSOL #13	11/18/2014
Carolyn Bender	Accounting	12/13/2014

## 10 YEARS

Terry Yokota	Sylmar Headquarters	12/8/2013
Troy Bolton	EVV Shop	1/5/2014
Colt Young	EVV Shop	1/26/2014
Albert Rummel	Webster Co. Coal	3/1/2014
Chad Vogel	FKC-Lake Shore	8/9/2014
Mike Dumm	Webster Co. Coal	10/4/2014
Kumar Gopalsamy	CM006	10/13/2014

## 5 YEARS

Jeff Crumbacher	EVV Shop	9/8/2013
Jeremy Cundiff	FKC-Lake Shore	9/15/2013
Luis Lardizabal	Seymour-Capilano	9/26/2013
Brandon Hamburger	CONSOL #13	10/5/2013
Fernando Sicdoy	Seymour-Capilano	10/8/2013
Roy Boettcher	EVV Engineering	10/9/2013
Mickie Evans	FKC-Lake Shore	12/22/2013
Albert Lujano	ACI Tygart Valley	12/22/2013

# FKCI Bids Farewell to 150+ Years of Experience

## Dick Rogers Retires

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Richard “Dick” Rogers retired from his position as Chief Estimator of the Northeast Division Office (NEDO) on January 4, 2013 after over eighteen (18) years of service to Frontier-Kemper.

Dick and his wife, Toni, are in contract to sell their home in Connecticut and are planning to move to Dick’s home state of Rhode Island to be closer to daughter Molly, her husband, and grandchildren. Dick has a Civil Engineering Degree from the University of Rhode Island. He was selected as a member to “The Moles” in 2006.

Rich Raab, President of NEDO, stated “Dick is a versatile Engineer who has acquired a vast amount of knowledge over his long career in construction. He is like a human encyclopedia. Dick is a gentleman, treasured colleague, and friend who has significantly contributed to the success of NEDO over the past two (2) decades. He will be missed.”

## Debra Riger Retires

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Debra Riger shut down her computer and took her last call as Executive Secretary at Frontier-Kemper on September 16, 2013. In her 23 years, Debra served four CEOs, four CFOs, and countless other Presidents, Vice Presidents, and General Managers at FKCI. Debra’s tenure at FKCI began in 1990 as the Executive Secretary to Dyke Howell, Dan McFadden, and Bob Pond. As retirements came, Deb was instrumental in assisting each successive leader transition efficiently and with as little pain as possible. Debra was known to be extremely organized; the rumor is that she maintained detailed logs and kept backups of her backups! Her high moral character, combined with her attention to detail and genuine love for the Company made her the go-to person for any special project.

Debra realized her dream of living closer to family when she and husband, Sonny, packed-up and moved back to her home state of Louisiana in late 2013. Deb and Sonny are enjoying the sights, sounds, and tastes of the bayou – we wish them a long and adventure-filled retirement!

## Dale Bivens Retires

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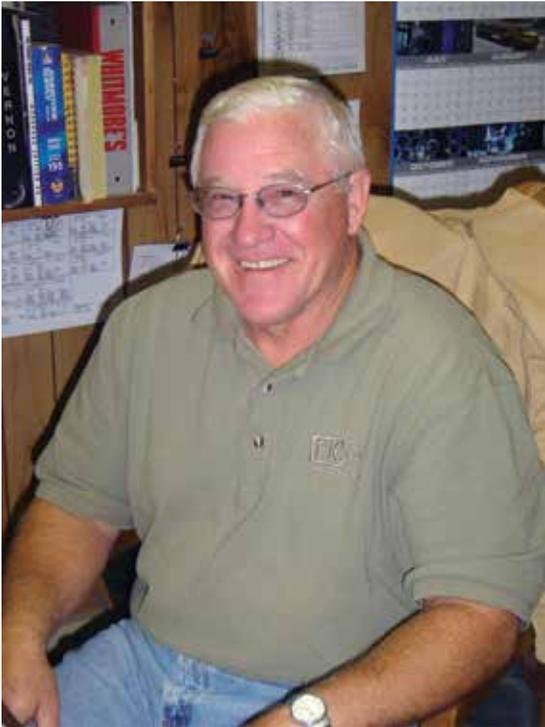
Dale Bivens decided to hang up his hard hat in August 2014. He spent 42 years working in the Mining and Civil construction industry experiencing projects ranging from shaft sinking, conventional tunnels, TBM tunnels, and other related work.

Dale grew up in Southern Illinois and graduated from Southern Illinois University, Carbondale after a stint in Vietnam with the military. He spent 18 years of his professional career working for several of the major players in the industry starting at Kiewit, then moving on to Centennial Development, followed by Obayashi. Next was an 18-year period at Traylor Brothers. During these 36 years, Dale was everything from bottle washer, gofer, Field Engineer, Project Manager, “Crisis Coordinator” to Estimator.

In 2008, Dale joined the Estimating department at Frontier-Kemper’s Midwest Division Office. He spent the last six years bringing his considerable, practical experience to bear on many successful bids for both mining and tunneling projects. His dry wit, vast “been there, done that” experience, and companionship will be missed. We wish Dale a long and enjoyable retirement.

## Dutch Carr Retires

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Dutch Carr, a lifelong West Sider (folks familiar with Evansville will get the reference), has spent most of his life working at west side businesses and supporting west side schools and youth activities. After a stint in the U.S. Army, Dutch began his career as a Welder at Babcock & Wilcox in Mt. Vernon, Indiana. He joined FKCI as a Welder in 1979. A skilled tradesman, Dutch's attention to detail frequently saved hours of rework and allowed him to educate Journeyman Welders, as well as Junior Engineers, on the finer points of material specification, fit, and overall fabrication. Dutch's innate ability to lead was evident to company leadership, and he was promoted to Fabrication Foreman in 1985; then Shop Superintendent in 2001. Under his guidance, the Evansville Shop increased capacity, quality, and safety.

Outside the office, Dutch is an avid outdoorsman and a dedicated husband and father. With their dad by their side, Dutch's boys learned to love the outdoors; and all have become respected gamesmen in their own right.

Throughout his career, Dutch put the welfare of his crew (his family away from home) first. He taught them to perform their work with integrity but allowed them to have fun at the same time. Dutch saw his share of ups and downs in his 35 years at Frontier-Kemper. A cartoon depicting a frog fighting to not be eaten by a large bird that hung on the wall next to Dutch's desk echoed his mantra for his many years of dedicated service to FKCI – "Never, never, never, give up." Dutch never did. We wish Dutch a long retirement filled with many years of hunting, fishing, and camping.

## Dave Trout Retires

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Dave Trout is no stranger to teamwork. As a multi-sport varsity athlete at Mt. Vernon High School and, later, as Frontier-Kemper's Shop Superintendent and Equipment Manager, Dave always possessed the ability to lead without being overbearing – it's not a stretch to say Dave epitomizes what it means to be a servant leader.

Dave began his career at Frontier-Kemper when he joined FKCI's old Mt. Vernon Yard as a Welder in 1977. As the right-hand man to Shop Superintendent, Ed Sieverding, Dave was relied upon to oversee the day-to-day operations of the Evansville Yard. Dave succeeded Ed as Shop Superintendent in 1991. As a leader, Dave's calm demeanor and tolerance for the daily demands of the job allowed him to lead his crew with laser-like focus; undeterred by distractions that commonly take a team off task. He was promoted to Equipment Manager in 2001.

Outside of work, Dave wore many hats; cyclist, runner, golfer, and University of Kentucky Basketball fanatic. After losing a bet during March Madness one year, Dave was required to wear an Indiana University shirt to work the following day. True to his word, Dave showed up in cream and crimson, but he added another element to the ensemble – he wore a bag over his head to hide his identity! That was Dave. Always a man of his word, nothing wavering and always ready to have a good time getting the job done.

We thank Dave for 37 years of loyal service and the many smiles he brought to our faces. Best wishes for many years of laughs, days at the links, and maybe even the occasional UK victory.

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Crosscut is FKCI's semi-annual newsletter. Just as a crosscut in a mine or tunnel provides a connection between one area and another, this newsletter serves to connect the various parts of our organization. The Crosscut's aim is to celebrate accomplishments, provide explanations and information, and promote communication. To help maintain the standard of our publication, your comments and suggestions are appreciated and welcome. Write to FKCI Crosscut, P.O. Box 6690, Evansville, IN 47719-0690.