

# SLINGMAKERS

Issue No. 110

Summer, 2006

## Message from the President

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Dear AWRF Members,

As I sit to compose my last of four "Letters from the President", I am amazed at how quickly time has passed! It seems like yesterday that I wrote my first one right after the fall meeting in Boston. All the past presidents had told me that my term would go by in the blink of an eye and they were right!

It's been a busy 2006 so far and I don't see it letting up. Our Spring General Meeting was held in St. Petersburg, Florida. For those of you who were not able to attend the meeting, you missed one of our best. The hotel was lovely and the weather was cooperative. The presentations were excellent due, a great deal, to the work of our Program Committee chairperson, Mr. Paul Boeckman. Our hats go off to you Paul for putting together an impressive program. Our featured presentation was "Wire Rope Forensics" by Roland Verreet of Wire Rope Technology in Aachen, Germany. Roland's last presentation to the AWRF was at our fall 2001 meeting in New Orleans. Roland is one of the most knowledgeable people in the world on the subject of wire rope. Roland's presentation spanned both days and kept us all fascinated and asking for more! Our entertainment at the banquet was "Motown Madness" featuring the Blues Brothers. They had the dance floor packed and then some! I had not ever seen so many of our members out on the dance floor at any other meeting. From young to not so young, they were dancing! Another great job was

done by our Entertainment Committee chairperson Denny Worswick. Of course the persons who make it all come together are our Executive Director Jeff Gilbert and his assistant Dee Dee. Without their hard work none of it would happen.

In March of this year I was invited to the OIPEEC meeting which was held in Athens, Greece. I was also invited to sit in upon their Management Board meeting. I took this opportunity to propose to their Board that OIPEEC should join AWRF so that their members would be able to attend our meetings. This proposal was well received and they made the counter proposal that AWRF should join OIPEEC so the same benefits could be extended to our members. At the closing banquet the OIPEEC President and I signed a "Letter of Understanding" that we would join each others organization so our members can receive the benefits of both. It was a significant moment for both organizations, one which I hope AWRF can build upon and enter into similar arrangements with other like minded organizations around the world. To learn more about OIPEEC, visit their web site [www.oipeec.org](http://www.oipeec.org). All AWRF members can now attend OIPEEC meetings at the member rate. They only hold their technical meetings every other year and I believe the next meeting is scheduled for South Africa in 2008. A deep mine tour as part of the program is planned.

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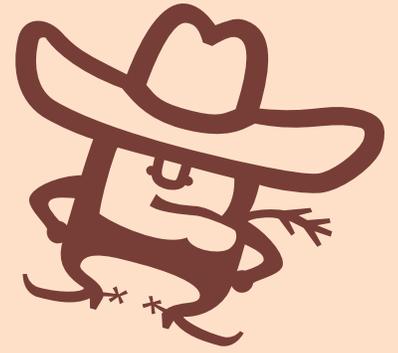
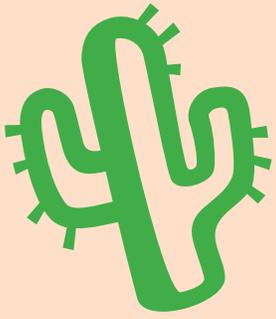


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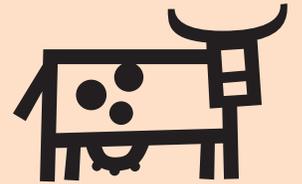
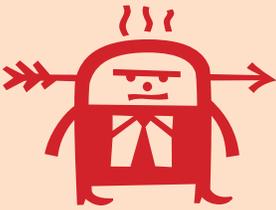
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# SHOP TALK



## Corrosion in Wire Rope

Don Pellow, P.E.

Lubricating wire rope products is a necessity for all wire ropes exposed to the elements, whether they are Lubricating wire rope products is a necessity for all wire ropes exposed to the elements, whether they are operating over sheaves, around drums (Image 1), or just absorbing vibration and/or shock loading as standing lines Even wire rope slings require field re-lubrication. Lubrication is necessary for two primary reasons. First, it will allow the wires to properly move and adjust to equalize loading as the wire rope or cable passes over sheaves, around a drum, or simply supporting a load with line tension fluctuations. Second, the lubrication provides a protective barrier to prevent or inhibit corrosion or oxidation of the steel wire surfaces.



Image 2

As the lubricant, or even a galvanized or aluminized coating, is worn or removed from the wire surfaces, the bare steel wires come into direct contact with the environment. Corrosion or rust will begin to form on these unprotected steel surfaces in the presence of moisture, air, or other chemicals. The process of oxidation begins, which can result in catastrophic consequences if left unchallenged.

*Don Pellow, P E., is president of Pellow Engineering services, Kansas city, Mo, an engineering consulting firm with expertise in wire rope and slings. He also is the publisher of Bob's Rigging and crone Handbook Pellow can be reached at dpellow@aol.com and www.donpellow.com.*

When Wire rope is manufactured, it is common practice to thoroughly coat a wires as they are formed at the stranding machine, resulting in the wires being completely coated around their circumferences (Image 2). However, as the wire rope is used, the lubricant is lost by a combination of external forces and conditions. These include handling during shipment and installation; wear, abrasion, and contact with drums, sheaves or guides, compression forces between the wires, strands, and core-, and environmental conditions such as moisture, heat, wind blown particles, or chemicals.

The first stage of corrosion is the appearance of a light, orange-colored oxidation on the outer wires. In operating wire ropes, this usually occurs on the crowns of the wires where they contact sheaves, drums, or guides (Image 3). This is superficial rust and can be wiped from



Image 3



Image 4

the wire rope with no apparent damage to the wires (Image 4). At this time, it is recommended to re-lubricate the wire rope to prolong the wire rope's service.

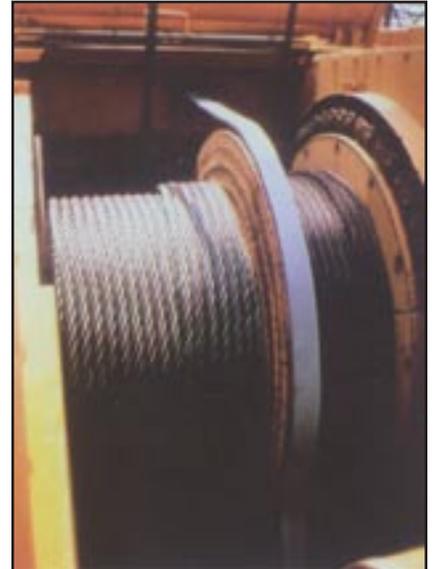


Image 1

If left unchecked, this initial surface corrosion will spread across the worn, uncoated surfaces, and it will become thicker and begin to penetrate the wire surfaces (Image 5). If the wire rope travels over sheaves or around drums, small steel particles consisting mostly of iron oxide can begin to flake from the wire surfaces. This will expose new areas of bare steel wire, which then re-initiates the corrosion process.



Image 5

As the amount of lubricant continues to decrease, red corrosive oxides will appear in the valleys of the wire rope and between the outer wires (Image 6). At this point, the lubricant within the wire rope is greatly depleted, and the strand-to-strand contact areas



Image 6

display, a rusty condition. Because the section of, this particular wire rope has been operating over sheaves, the crown of the outer wires have been exposed to elements, for some time, and the corrosion has begun to penetrate the surfaces of the crowns of the outer wires (Image 7) in a random crevice pattern. This “pitting corrosion” is an advanced stage of oxidation of the steel, which has begun to reduce the cross-sectional steel area of the wires.



Image 7

Oftentimes at this stage in wire rope service life, the inside of strands may lose all traces of lubrication and begin to show internal corrosion (Image 8). Unrestrained and continued use of the wire rope in this same environment, the corrosion will continue to attack the steel wires. The corrosion culminates in significant loss of cross-sectional steel areas, the reduction in bending fatigue life of the wires, and lack of wire rope flexibility. The end result is a wire rope with appreciably less strength, reduced bending fatigue life, and the inability to equalize loading among the wires and strands as it is flexed or bent



Image8

A wire rope in this highly corroded condition may experience randomly broken wires in the section when traveling over sheaves or around drums due to reduced wire strength and unequal loading among all the wires and strands (Image 9). Image 10 depicts a wire rope with minimal outer wire wear in a very advanced stage of pitting corrosion that was tensile tested to its remaining ultimate strength. It broke at 50 percent of its original certified strength with only two outer strands rupturing. Normally, a new, unused wire rope pulled to breaking strength will result in three to



Image 9



Image 10

four outer strands and the core breaking, which reflects on the fact that severe corrosion dramatically reduces the strength of a wire rope, not by only loss of cross-sectional steel area but by inhibiting the free movement of the wires and strands.

Reapplying lubrication at such an advanced stage of corrosion will have little effect on prolonging the wire rope service; it actually may generate a dangerous situation by covering up or hiding the pitting corrosion that would otherwise be obvious during visual inspection. Lubrication at this stage of severe pitting corrosion will not reinstate the integrity of the wire rope. In fact, wire rope should never be left in service in such condition and must be replaced at a much earlier stage of corrosion as prescribed by ASME standards and OSHA regulations.

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# GOVERNMENT AFFAIRS COMMITTEE REPORTS

## SMALL BUSINESS HEALTH CARE PLANS

By  
Barry Epperson,  
General Counsel and Chairman,  
Government Affairs Committee



For the first time in over a decade, legislation to help small businesses obtain affordable health care packages through their trade associations makes it to the Senate floor.

AWRF members are eager to see the U.S. Congress enact a bill that will afford them some collective leverage in purchasing health care insurance. Because labor unions and large companies inherently enjoy such purchasing power, non-profit associations are considered the best and most logical vehicles for small shops to level the health care playing field, allowing them to compete for discounted premiums.



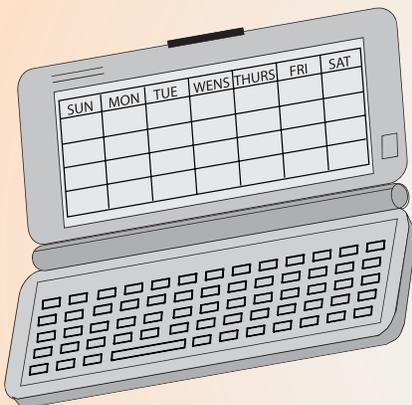
Twice this year, your Government Affairs Committee (GAC) has joined coalitions on Capitol Hill to lobby specific Senators who have declared opposition to or uncertainty about their positions relative to association sponsored health plans. As a result of earlier lobbying efforts, the House of Representatives led the way with passage of their own bill (H.R. 525) on July 26, 2005. Unlike the House rules, however, Senate protocol allows unlimited debate (the filibuster) absent a three-fifths majority to invoke cloture and move the issue to a vote. In the end the effort fell five votes short (55-43) with two Democrats and one Republican crossing party lines.

Despite the cloture rejection, many proponents of association health care plans claimed a partial victory because the event marked the first time such legislation had ever advanced beyond committee consideration. In a straight up and down vote, there is little doubt that the bill would have passed by a comfortable majority. Casting opponents of the bill as obstructionists, Majority Leader Bill Frist declared their actions as shameful for preventing a vote on a matter that would have provided affordable health care for millions of uninsured citizens.

Small business members of AWRF can be assured that your GAC team will be in the middle of the fight when the bill is reintroduced next year in the 110th Congress. As we have learned from gradual tort reform successes over the years, the legislative process unfolds one step at a time. The extended debate this year has provided sufficient data to craft the compromise language necessary to win over certain Senators who voted against S. 1955.

To find out how your Senators voted on S. 1955, contact Barry Epperson at (918) 585-5641 or [jbarrye@aol.com](mailto:jbarrye@aol.com).

## A.W.R.F CALENDAR



### 2006

- September 18-19 ASME B-30 Meeting  
St. Louis, Missouri
- October 6 AWRF Government Affairs Briefing  
Washington, DC
- October 22-25 AWRF Fall General Meeting  
Westin Riverwalk  
San Antonio, Texas

### 2007

- April 22-25 Renaissance Esmeralda  
Resort and SPA  
Palm Springs, California  
Product Information Exhibition  
(P.I.E.)

# WHAT'S IN YOUR WALLET?

## Some Facts About Identity Theft

Three real life experiences have contributed to my personal appreciation of the horrors of identity theft.

The second occurred during a vacation in Paris in the fall of 2004, when my wallet was stolen by a pickpocket. Although the billfold was eventually recovered by the gendarmes with credit cards intact (minus fifty euros), the intervening days were a nightmare of logistical reconstruction, overshadowed by the anxiety of stolen identity. The feeling was not unlike an earlier emotionally-charged event in which I found myself lost in the snowy wilderness during a hunting trip in northern New Mexico. In each instance, there seemed to be a total lack of control over the situation.

The third incident took place in the fall of 2005 at the Creek Nation Casino in Tulsa, Oklahoma, at which time a convicted felon on parole was apprehended by the police while fleeing the scene of an attempted holdup. During the ensuing search of her person, the police discovered that her Oklahoma driver license bore her own photograph, but the name and description of the college-age daughter of one of my clients whose physical characteristics were similar. Following a protracted investigation, it was determined that while no immediate identity usurpation had occurred, the threat of reprisals could continue indefinitely. Once again – a feeling of helplessness for the young victim and her family.

### Laptop Thefts

One of the most accessible inroads to your identity may be from information stored in your laptop or one belonging to someone with whom you do business. This supposedly private sanctuary often contains lists of client data, account numbers and other more intimate or confidential data. Since forty percent of all laptop larcenies occur in private offices, security and storage in these venues should take the highest priority. Recommended techniques and guidelines for laptop protection in these areas, as well as during transportation, are discussed in a new business video from Commonwealth Films ([www.commonwealthfilms.com](http://www.commonwealthfilms.com)) entitled Look Out For Your Laptop. This film is currently under review by the GAC for presentation at the next Association convention in San Antonio.

### Scams

One of the latest identity theft operations begins with an official-sounding phone call advising you that a warrant has been issued for your arrest because you failed to show up for jury duty. The caller claims to be a jury coordinator. If you protest that you never received

a summons for jury duty, the caller asks for your date of birth and social security number so he or she can verify the information and cancel the arrest warrant. This type of scam has been reported in eleven states.

### Invisible Thieves,

The most devastating disclosure of confidential data generally occurs when an employee of a financial institution loses a laptop. Usually, a multiplicity of customers or clients are compromised. Because locating, prosecuting and collecting damages from the perpetrator of a stolen identity is time-consuming and expensive, more victims are pointing the finger of liability at the institution which allowed exposure of the victims' private data. Although the FTC often imposes severe institutional fines for such negligence, the individual victims included must look to the court system for recompense. Unfortunately the jurisprudence which circumscribes such lawsuits is fragmented and unsettled both among and within the various jurisdictions – especially when it comes to proving damages.

### Congressional Intervention

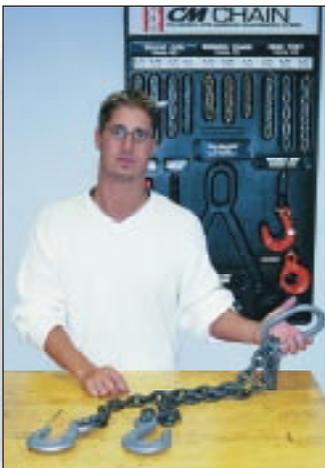
According to the Federal Trade Commission, 255,565 complaints of identity theft were reported last year. Too significant to ignore in an election year, this subject has worked its way into the halls of the U.S. Congress where a bill requiring reasonable security policies and procedures to protect computerized personal data (H.R. 4126) passed the House Energy and Commerce Committee by a vote of 41 to 0 on March 29th. The Government Affairs Committee will continue to monitor this proposed legislation.

## GOVERNMENT AFFAIRS BRIEFING IN WASHINGTON, D.C. October 6th

Join your AWRP colleagues on October 6th for the sixth annual government relations briefing at the U.S. Chamber of Commerce in Washington, D.C. Sponsored by the Government Affairs Committee, the event is an exclusive for AWRP members and their guests. A lineup of experts will bring you up to date on subjects critical to the survival and success of your business. Several rooms have been blocked for the evening of October 5th at the Madera Hotel, 1310 New Hampshire Avenue NW, Washington, D.C. 20036. Call the hotel sales office at 202-521-7403 for special hotel rates and reservations. Please advise Barry Epperson of your plans to attend the event (918-585-5641, 918-640-5773 or [jbe@sbcglobal.net](mailto:jbe@sbcglobal.net)). There is no registration fee.

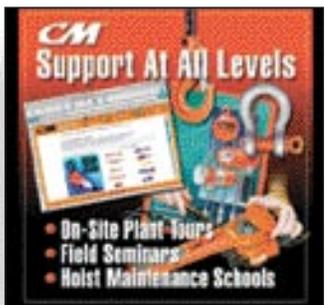


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# Reduction in service life of wire ropes running over sheaves with angular offset

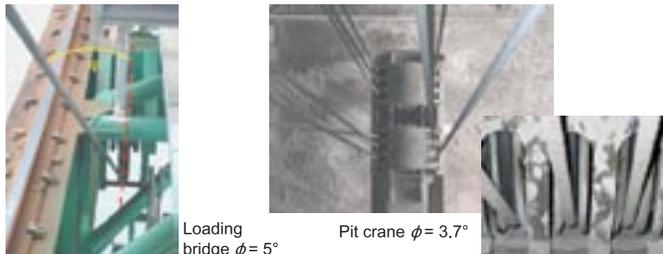


**Abstract**

In many applications which use rope drives, such as crane drives, ropes inevitably run over a pulley with a fleet angle. Excessive fleet angles can cause serious damage to the wire ropes, pulleys and grooved drums. Even though this has been known for a long time, the negative impact of rope deflection has not yet been subject to a comprehensive quantification. The purpose of the study - funded by the German Research Foundation (DFG) - was a fundamental examination of the influence and effects of fleet angle on the service life of ropes running over pulleys. In the theoretical part of the study all the relevant factors influencing rope service life with a fleet angle were determined and analysed. Thus, it was possible to identify the key rope and rope drive parameters affecting the service life of ropes running over sheaves with a fleet angle. The project focused on systematic and reproducible fatigue bending tests. In the tests performed with fleet angle the rope service life and the development of wire breaks was analysed with 6 ordinary lay ropes and rope diameters  $d = 12$  mm and  $d = 16$  mm. As a result of these tests, the service life reduction of ordinary lay ropes with fleet angle was quantified in comparison with their service life without fleet angle.

**1 Introduction**

Even though it has been known for a long time that the service life of ropes is reduced when running over sheaves with angular offset, the negative impact of rope deflection has never been subject to comprehensive scientific examination or quantification. This situation is unsatisfactory since lateral rope deflection in the rope drives of cranes, hoisting gear and passenger lifts is frequently unavoidable due to design considerations (Figure 1). This could result in a reduction in the operational safety of these installations.



**Figure 1:** Lateral rope deflection in rope drives.

For this reason, DIN 15020 (1974) limits the lateral deflection of ropes to  $\phi = 4^\circ$  (or  $1.5^\circ$  for ropes with low or no torsional tendency). However, this standard is based only on practical experience and has not been confirmed by empirical test results. Rope drives can only be adequately dimensioned and appropriate inspection intervals specified by drawing on reliable empirical data for the rope drive parameters affecting the service life and the impact of such parameters on rope lifetime.

**1.1 State of research**

The theoretical and practical investigations on angular offset carried out to date have only focused on selected aspects of rope deflection: Matthias (1966) describes, in relation to different rope and sheave geometries, the geometrical position of the point at which the rope touches the sheave flange in such a way that it does not run over the groove edge. Petkow (1968) determines the wear distance on the sheave flange by considering rope bending stiffness. Oplatka (1990) and Verreet (1999) show the rope twist with angular offset. The experimental investigations of Neumann (1987) and Heepen (1995) carried out to date have concentrated specifically on tribological damage to ropes with angular offset used in steel mill cranes. The bench tests were restricted to very few impact parameters and rope constructions and were only performed up to the number of bending cycles indicating discard. The only attempt aimed at quantifying the extent to which service life is reduced owing to rope deflection has been undertaken by Feyrer (2000), who established factors  $f_{NA}$  for estimating the bending cycle numbers up to discard with rope deflection based on approximately 60 tests with one rope (Neumann, 1987). There is therefore a significant lack of reliable, proven data available on the reduced service of wire ropes subjected to angular offset.

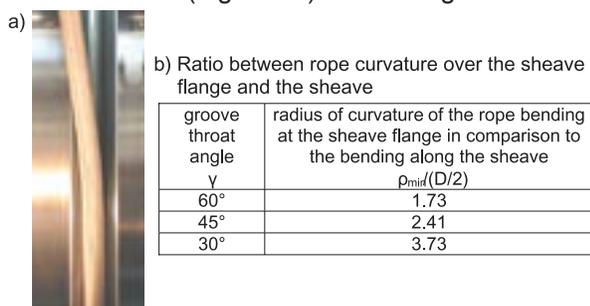
**1.2 Purpose and approach**

The aim of the DFG-sponsored research project “Reduction in service life and security of wire ropes running over sheaves with angular offset” which was conducted at the University of Stuttgart’s Institute for Mechanical Handling and Logistics (IFT), was to perform extensive scientific investigations on, and quantifications of, the damage caused by lateral rope deflection and its influence on the service life of wire ropes. The service life reduction caused by angular offset was examined by evaluating a large number of fatigue bending tests.

**2 Additional stress and rope deterioration due to angular offset**

Ropes that are not only bent over the sheaves, but also deflected laterally along the sheave flange, are subjected to additional stress.

When a rope is deflected laterally, it is not only bent around the sheave but also around the sheave flange (Figure 2a). The **bending stress** on the rope arising from bending it around the sheave flange is smaller than from bending it around the sheave due to the larger radius of curvature (Figure 2b) at the flange.



**Figure 2:** (a) Curvature of the laterally deflected rope over the sheave flange;

Continued on page 30

# WIRED ROPE

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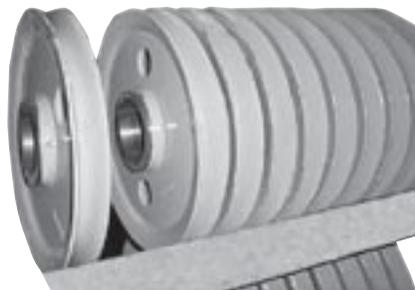
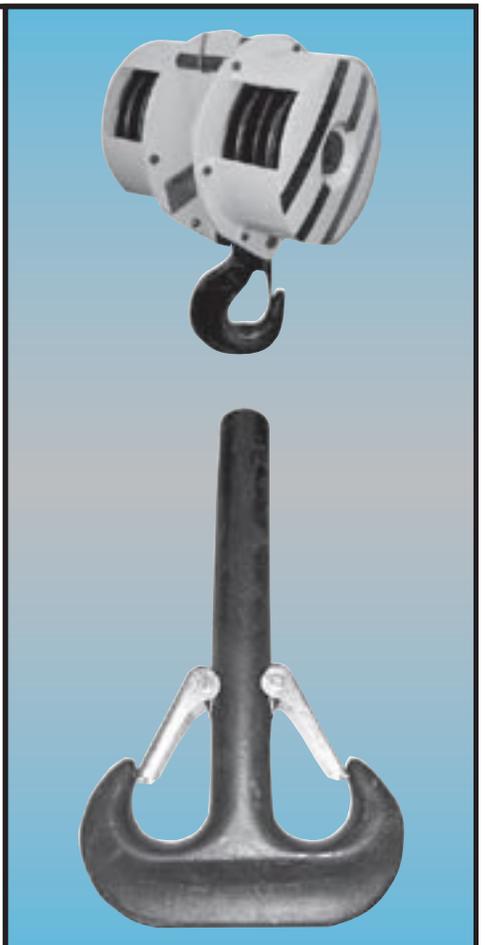


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## Keep Workers Safe In Hot Weather

Fast thinking employees performing clean up and recovery work in New Orleans helped to save a co-worker's life on May 4 by using an OSHA "QuickCard" to identify signs of heat stroke and then provide first aid until an ambulance arrived a few minutes later. Earlier that day, the small group of tower workers and their supervisor, held a 15-minute safety meeting to discuss the recognition, treatment, and dangers of heat related illnesses.

After being treated for heat stroke, the worker was released from an area hospital and returned to work the next day. An attending physician said that if treatment had been delayed another 15 minutes, he might have died.

While the outcome of this story as reported in an OSHA Trade News Release is not likely to lead the nightly news or appear on the local paper's front page, it does represent a real scenario that plays itself out many times throughout the hot summer months. However, because of foresight, fast thinking, and the right information, tragedy can be averted.

Summer months produce the combination of heat, humidity and physical labor that can be dangerous for those working in that atmosphere. To help workers and employers become more aware of these hazards and how they can protect themselves, the following tips must be followed.

OSHA has produced a Heat Stress Card known as the "QuickCard" and it is free to employers to distribute to their workers. It is a laminated card and is available in English and Spanish. This card offers a quick reference about heat-related injuries, including warning signs, symptoms and early treatment.

When the body is unable to cool itself by sweating, several heat-induced illnesses such as heat stress or heat exhaustion and the more severe heat stroke can occur, and can result in death.

## Factors Leading to Heat Stress

- High temperature and humidity.
- Direct sun or heat.
- Limited air movement.
- Physical exertion.
- Poor physical condition.
- Some medicines.
- Inadequate tolerance for hot workplaces.

## Symptoms of Heat Exhaustion

- Headaches, dizziness, lightheadedness or fainting.
- Weakness and moist skin.
- Mood changes such as irritability or confusion.
- Upset stomach or vomiting

## Symptoms of Heat Stroke

- Dry, hot skin with no sweating.
- Mental confusion or losing consciousness.
- Seizures or fits

## Preventing Heat Stress

- Know signs/symptoms of heat-related illnesses; monitor yourself and coworkers.
- Block out direct sun or other heat sources.
- Use cooling fans/air-conditioning, rest regularly.
- Drink lots of water; about one cup every fifteen minutes.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid alcohol, caffeinated drinks, or heavy meals.

## What to Do for Heat-Related Illness

- Call 911 (or local emergency number) at once

## While waiting for help to arrive:

- Move the worker to a cool, shaded area.
- Loosen or remove heavy clothing.
- Provide cool drinking water.
- Fan and mist the person with water.

Teresa McGee  
AWRF Safety Committee Chairman

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style has full swivel and pivot action. Patented *tamper-resistant* design is great for permanent mounting applications. 500 to 4,000 lb. capacities. Available in inch, metric and stainless steel. U.S. Patent 5,743,576.



**Side Swivel™** Economical design for OEM applications. Full swivel and pivot action. 650 to 4,100 lb. capacities. U.S. Patent 6,443,514.



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## THE EMPLOYER'S ADVISORY

### A QUARTERLY NEWSLETTER

### HIGHLIGHTING CURRENT EMPLOYMENT LAW ISSUES

#### PREPARED BY

ATTORNEYS BETTY BECHTEL AND MICHAEL SANTO

1 Quarter BECHTEL & SANTO, L.L.P. 2006

### TERMINATING OLDER WORKERS IS NOT FOR SISSIES!

The editors of this newsletter, personally, do not think of employees who are 40 years old as "older workers," but Congress does. The Age Discrimination in Employment Act (ADEA) classifies anyone 40 or above as an "older worker" who can not be discriminated against in employment on the basis of age. Congress was so concerned about the employment rights of the ancient ones that it also enacted the Older Workers' Benefits Protection Act ("OWBPA") to protect them from unknowingly giving up their right to sue the employer for age discrimination. Under the OWBPA, an older worker can sign a release of claims in exchange for severance pay, collect the money, and still sue the company for age discrimination, unless all of the OWBPA's requirements are satisfied. The courts are, similarly, unforgiving when enforcing the OWBPA, as one employer recently discovered.

Weyerhaeuser Company determined to layoff 31 employees. Although it had no legal obligation to give these employees a severance package, it did, on condition that the employees sign a written waiver of claims and agree not to sue the Company as a result of the layoff. Employees signed the waiver, collected their severance package and then sued Weyerhaeuser for age discrimination, pointing out that 28 of the 31 employees terminated were 40 or older.

Weyerhaeuser countered with the waiver agreements, and the trial court dismissed the employees' law suit because the waiver said they released the company from claims of age discrimination. But the employees were tenacious and appealed to the 10th Circuit Court of Appeals. The 10th Circuit found that the waiver agreements were invalid because they did not strictly comply with all of the requirements for releases under the OWBPA. The case is now remanded to the District Court for trial.

What was wrong with the waivers? The 10th Circuit explained that an individual may not waive any right or claim under the ADEA unless the waiver is knowing and voluntary. A waiver is not knowing and voluntary unless at a minimum it satisfies the OWBPA's requirements as follows: (1) the release must be written in a manner calculated to be understood by the employee signing the release, or by the average individual

eligible to participate; (2) the release must specifically refer to claims arising under the ADEA; (3) the release must not purport to encompass claims that may arise after the date of execution; (4) the employer must provide consideration for the waiver or release of ADEA claims above and beyond that to which the employee would otherwise already be entitled; (5) the employee must be advised in writing to consult with an attorney prior to executing the agreement; (6) the employee must be given at least 45 days to consider signing if the incentive is offered to a group, or 21 days if offered to an individual; (7) the release must allow the employee to revoke the agreement up to 7 days after signing; and (8) if the release is offered in connection with a group termination program, the employer must provide information relating to the job titles and ages of those eligible for the program, and the corresponding information relating to employees in the same job titles who were not eligible or not selected for the program.

In addition to the above requirements, the OWBPA provides that when a group of employees is being terminated, written notice must be given identifying the group or unit considered for the termination program, any eligibility factors for such program, and any time limits applicable to such program. Weyerhaeuser goofed by not correctly identifying the group or unit considered for termination. Its termination notice advised employees that all salaried employees at its mill were considered for layoff. In fact, the unit considered was only employees reporting to one person. Also, Weyerhaeuser did not advise the employees of the "eligibility factors" it used to determine which individuals in the group would be terminated. The eligibility factors were the leadership, abilities, technical skills, and behavior of each employee and whether each employee's skills matched its business needs. Weyerhaeuser's failure to disclose this information rendered the waivers ineffective as a matter of law.

Lesson: No employer wants to give a group of employees severance pay in exchange for their release of claims only to find itself later defending an age discrimination law suit because the release was defective. Under the OWBPA, employees do not even have to refund the severance pay before suing. In drafting a release and waiver of claims for any employee 40 or older, carefully review the OWBPA's requirements and make sure each requirement is satisfied. *Kruchowski v. Weyerhaeuser Co.*, 423 F.3d 1139 (10th Cir (Okla) 2005); 29 U.S.C. §626.

### THE FMLA IN REVIEW

When Congress enacted the Family and Medical Leave Act (FMLA) back in 1993, it assured businesses

that the FMLA would not be a financial burden for employers because the 12-week leave allowed under the Act for serious health conditions was unpaid. But, as businesses have learned in the past 13 years, there are a zillion costs associated with administering the FMLA in their workplaces, not the least of which is the cost of defending the law suits employees and their attorneys love filing for alleged violations of the FMLA. And the reported cases are increasing each year. Unfortunately, regardless whether the employer wins or loses an FMLA law suit, the cost of defending the claim can be HUGE.

## **Here is a sampling of recent FMLA claims employers have battled:**

### **MONITORING SICK LEAVE ABUSE**

David Callison was employed by the City of Philadelphia. Initially, Callison was a reliable employee. But after a year he began to have serious attendance problems due to deep anxiety reactions caused by stress at home and at work.

Due to his attendance problems, the City placed Callison on its “Sick Abuse List.” This designation required Callison to obtain medical certification for all sick days. It also meant that on days when Callison was absent for illness, the City required him to contact the Sick Leave Hotline when leaving his home and upon his return. The policy further provided that Callison was to “remain at home except for personal needs related to the reason for being on sick leave. While on sick leave an employee may be called or visited by a sick leave investigator....”

During Callison’s next two FMLA-covered absences, a sick leave investigator telephoned Callison at his home to make sure he wasn’t violating that policy. On both occasions, Callison was not home and he had not notified anyone at the City that he was going out. So, the City gave Callison two suspensions, which he served upon return from the FMLA leave. Then, Callison sued the City claiming the enforcement of its sick leave policy infringed on his FMLA rights. He asserted that “once an employee is on pre-approved FMLA leave, he should be left alone.” The Court disagreed.

First, the Court determined that the City’s requirement to call the “Sick Leave Hotline” when leaving home during regular work hours did not conflict with any substantive provision of the FMLA, and that the requirement did not compromise the FMLA’s purpose because it neither prevented employees from taking FMLA leave, nor did it discourage employees from taking such leaves. Instead, the Court reasoned, it ensured that employees did not abuse their FMLA leave.

Second, the Court found that, contrary to Callison’s assertions, there is no right under the FMLA to be “left alone” while on FMLA leave. Nothing in the FMLA prevents employers from ensuring that employees who are on leave do not abuse their leave, “particularly those who enter leave while on the employer’s Sick Leave Abuse list.”

In sum, the Court determined that nothing in the FMLA prevented the City from enforcing its leave policies or permitted Callison to ignore the rules in the City’s sick leave policies when he was on FMLA because the City’s policies did not interfere with Callison’s rights under the FMLA. *Callison v. City of Philadelphia*, 128 Fed.Appx.897 (3rd Cir. 2005).

### **A WOLF IN SHEEP’S CLOTHING**

As the Callison Court explained, employers are permitted to consistently enforce their leave policies, unless that policy infringes on eligible employees’ FMLA leave rights. This infringement is illustrated in the following case.

On June 22, 2003, Sandra Solovey learned that her father was ill. She immediately requested that her employer grant her FMLA leave for June 23 and June 26 so that she could care for her father’s serious health condition. Her employer agreed. Because FMLA is an unpaid leave, Solovey also requested that her employer permit her to concurrently use her paid vacation leave on those two days. Her employer denied that request because its sick leave policy required employees to provide two-weeks’ advance notice before taking a paid vacation day. Solovey sued.

As the basis for her claim, Solovey claimed that the FMLA permitted her the ability to concurrently use accrued paid leave when taking FMLA leave (“[a]n eligible employee may elect, or an employer may require the employee, to substitute any of the accrued leave ... for any part of the twelve-week period”). Her employer countered that its two-week notice provision was not a “limitation,” but operated as a “regular requirement of the vacation provisions set forth in the collective bargaining agreement.”

The Court disagreed with the employer’s semantic argument in finding that, no matter how it was titled, the two-week notice requirement operated as a limitation on Solovey’s FMLA rights.

Practical Tip. These two cases (Callison and Solovey) emphasize a critical point: courts will support employers in the consistent enforcement of their work rules, as long as those work rules do not violate, or infringe on, eligible employees’ FMLA rights. But when the work rules do infringe on those rights, no matter how consistently the employer may enforce those rules, application of the rules can create liability under the FMLA. Accordingly, employers who are covered by the FMLA should review their policies and practices to ensure that they do not operate to infringe on employee’s rights under the FMLA.

*Continued on page 19*

# Wire Rope Technical Board

An Association of American Wire Rope Engineers  
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In addition to information and criteria, the brochure includes an Inspection Form which may be copied easily for recording results of regular inspections for the permanent, written files required by many regulations.

This new brochure is a companion piece to WRTB's 4-page Wire Rope & Wire Rope Sling Safety Bulletin. AWRF members and others have found this document very useful in conducting safety meetings and training sessions that many customers request. The intent of the new 12-page brochure is to provide useful, helpful information to employees of wire rope users via an economical "handout" for training sessions and classes. Both documents also provide a convenient outline of subject material for use at these meetings.

WRTB is offering the new document, available soon from WRTB Fulfillment, packaged in 25-copy shrink-wrapped bundles. The price is \$15.00 per 25-copy bundle.

The WRTB members are companies represented by engineers and wire rope specialists from the domestic wire rope industry. All of the WRTB member companies are also members of AWRF and support the association's goals by providing products of this type. Company representatives are also available for presentations to AWRF and they participate in association and Technical Committee meetings.

For more information and a copy of the order form for the new Inspection Brochure visit our website at <http://www.domesticwirerope.org/> or by contact WRTB Fulfillment at 888.289.9782 or [ldmeans@stjoelive.com](mailto:ldmeans@stjoelive.com).

PRESS RELEASE  
August 1, 2006

Contact:  
Larry Means: 888-289-9782

## WIRE ROPE INSPECTION GUIDELINES PUBLISHED

Guidelines for inspecting a wire rope system or installation are now available in a new 12-page brochure, Wire Rope Inspection Guidelines, available from the Wire Rope Technical Board (WRTB).

The WRTB recently completed this brochure presenting important guidelines for inspecting wire rope systems or installations, excerpted from the newly published Wire Rope Users Manual, 4th Edition. One complimentary copy of the Users Manual is included in each AWRF Technical 3-ring binder.

The new inspection brochure was developed by WRTB in response to requests from the customers of AWRF member companies. It provides a clear and concise approach to assisting wire rope users to comply with industry and governmental regulations that require inspections of individual ropes, fittings and attachments, as well as entire operating systems, at regularly scheduled intervals.



## The Tour San Antonio, October 23<sup>rd</sup>

### Antiquing Boerne Style

(Approximate Time: 9 am - 3:00 pm)

Our motor coach arrives at your Hill Country Resort with a uniformed Capers' guide to escort you to Boerne, Texas. A delightful German community, Boerne is approximately 30 minutes from your hotel... a perfect drive time for our guide to acquaint y'all to a synopsis of Hill Country history and culture before arriving at our destination.

This small town is filled with antique stores and boutiques galore. Many shops have merchandise that is indigenous to the Texas Hill Country and the popular Texas folklore. Upon arrival, our guide will orient everyone to the various locations and popular spots for browsing and shopping. Our first stop, a demonstration of artistry by one of Texas' leading artists/craftsmen. Then let the retail therapy begin!

Everyone will meet at the historic and charming Ye Kendall Inn where a fabulous lunch menu awaits that

includes salad, pistachio nut crusted chicken with mustard cream sauce, roasted garlic & pimento mashers, a medley of fresh vegetables and Limestone peach cobbler for dessert.

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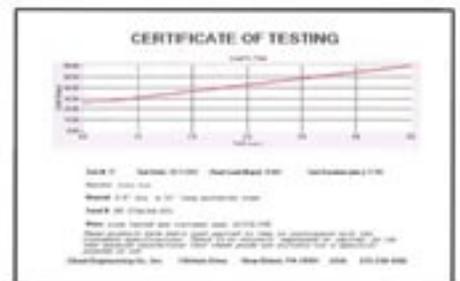
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# LAEDC ECONOMICS CORNER

- The U.S. economy is still expanding, with increasing activity in wire-rope related sectors.
- Prices of many industrial materials have strengthened recently. Will this continue?

## U.S. ECONOMIC SITUATION

The U.S. economy registered solid growth of 3.6% during the first quarter of 2006 from the same period in 2005. Unemployment has fallen steadily, and consumers and businesses still have a relatively favorable outlook. Even so, uncertainties are starting to show up. Concerns about the inflation rate are hovering over the Fed, raising questions about where interest rates are heading. This is a key factor in the cooling housing market. Another concern is high gasoline and commodity prices; are they going to show up in prices of other consumer items?

Consumer spending remains fairly high. Employment continues to grow at a steady pace as well as household income. However, the cooling of the housing market will dampen spending habits especially for housing related durable goods. High gasoline prices are distressful, but most consumers are finding alternative ways to cope. Automotive vehicle sales remain flat, though continued rebates and discount offers are required.

Housing starts are high but likely to fall, as unsold inventories are rising. On the other hand, nonresidential construction is up, boosted by reconstruction efforts in the Gulf Coast. Government construction also is growing nicely, as state and local government budgets improve and new federal transportation funds are released. However, concerns about high construction material prices continue.

Corporate profits remain high. Business spending for information processing equipment and software remains strong, though spending for other types of equipment has slowed a bit. Sales of construction and metalworking machinery, heavy trucks and railcars all have risen, for example. Oil and natural gas drilling and production also have increased significantly, due to high energy prices in the last couple of years.

U.S. imports of foreign-made goods and services have grown, swelling the goods trade deficit noticeably to \$742.5 billion during the first quarter of 2006. Exports increased as well, thanks to the low foreign exchange value of the U.S. dollar. Domestic production and sales are up as manufacturers start to build inventories once again. The Transportation Services Index (TCI\*) for

freight posted a flat reading during the first quarter of 2006. This should improve a bit more in rest of 2006, as firms try to build inventories more in line with higher sales.

Outlook: The economy will grow by about 3.5% in 2006. Housing activity will decline this year (but not crash), and light vehicle production and sales will be flat at best. However, growth in exports and fixed investment—especially nonresidential and infrastructure construction, commercial aerospace manufacturing, and most types of business equipment—will pick up the slack.

\* *The Transportation Services Index (TCI) measures the month-to-month changes in services provided by the for-hire transportation industries, including railroad, air, truck, inland waterways, and pipeline.*

## PRICES: AGAIN, IT'S THE ECONOMY!

After a year of high-but-moderating steel costs, wire rope producers and other US manufacturers are again facing upward cost pressures. As shown in Table 2, prices of many industrial commodities have risen in 2006, dramatically in some cases. Will there be more?

The primary factor in the resurgence of commodity prices is renewed strength in global economic growth, which is forcing economists and business firms to revise their forecasts upwards. U.S. economic growth still seems likely to settle at about 3.5% as expected in 2006, though it surged ahead at a 5.3% annual rate in early 2006. But Europe will grow by about 2.4% and Japan by 2.8% this year (vs. 1.8% and 2.7% respectively in 2005). Developing nations around the globe also are doing better than forecast, led by China (now expected to grow by 9.5% this year) and India (+7.3%).

Economic growth isn't the entire explanation for rising commodity prices. Market analysts point to increased purchases by "financial" buyers, hedge funds and the like, which exacerbate price volatility though they have little real influence on the physical markets.

Lean inventories are also part of the explanation. U.S. metal related and automotive producers and distributors pared stocks

all too successfully during 2005, and this left many unprepared for the first-quarter's surge in demand. The result? Prices for industrial commodities turned up, dramatically in some cases. Only lumber and natural gas prices have fallen significantly below the 2005 price, reflecting lower housing construction and warm weather.

World demand for steel is forecast to increase by about 50 million MT (+5%) in 2006. China alone will

**Table 1**  
**FACTORS INFLUENCING WIRE ROPE DEMAND\***

	2004	2005	1q06
Real GDP Growth	4.2	3.5	3.6
Manufacturing Production	5.0	3.9	4.7
Real Manufg & Trade Sales	6.4	3.6	4.3
Goods Trade Deficit (\$2000)	669.1	711.9	742.5
Vehicle Sales (Mils, SAAR)			
--Cars (Domestic)	5.4	5.5	5.7
--Light Trucks (Domestic)	8.1	8.0	7.8
--Medium/Heavy Trucks	0.4	0.5	0.6
Construction:			
--Housing Starts (Mils)	1.95	2.7	2.13
--Private Nonresid. Bldgs.	4.2	5.2	6.8
--Gov't Bldgs & Infrastructure	2.6	7.6	7.2
Bus. Equipment Spending			
--High Tech & Software	13.6	13.1	12.9
--Other Machinery	9.9	8.2	6.4
Freight Transportation	6.7	2.4	-0.2
Oil & Gas Rigs Running	1,192	1,381	1,521

\*% change from previous year unless otherwise noted.  
Sources: BEA, Federal Reserve Board, Census Bureau, U.S. Transportation Department, Baker Hughes

**Table 2**  
**PRICES OF INDUSTRIAL COMMODITIES**

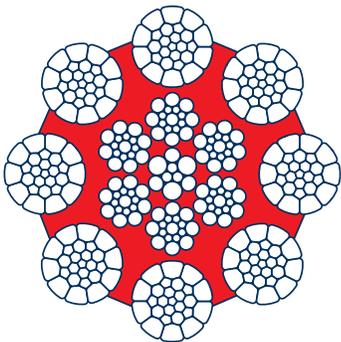
	2004	2005	2-Mo Average
<b>Steel Prices (\$/cwt):</b>			
--HR Sheet	605	541	568
--CR Sheet	690	635	658
--Wire Rod	505	515	515
--Rebar #6	469	475	485
--CF Bar	725	887	865
--Structurals	534	545	605
Steel Scrap (#1HM, \$/gt)	214	195	243
Iron Ore (¢/dmto)	37.90	65.00	77.35
Copper (\$/lb)	1.30	1.67	3.27
Aluminum (\$/lb)	0.78	0.86	1.24
Nickel (\$/lb)	6.27	6.69	8.85
Ethylene (¢/lb)	31.0	41.5	46.3
Lumber (\$/Mil Bd Ft)	395	354	323
Crude Oil (WTI, \$/Barrel)	41.44	56.44	70.17
Natural Gas (Henry Hub, \$/Mcf)	5.90	8.92	6.65

\* Average price for April and May 2006.

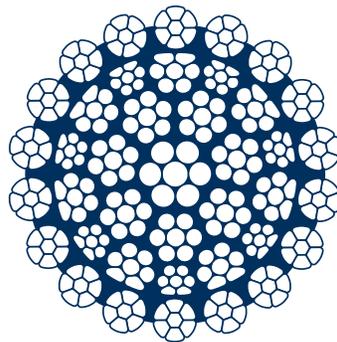
# Bought a *cheap* product again?



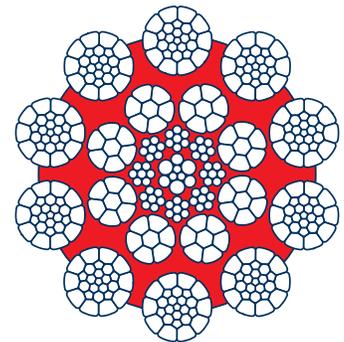
With swimming pools, and especially with steel wire ropes, the fun won't last for long.



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# THE EMPLOYER'S ADVISORY

*Continued from page 14*

## PUTTING CROWS OUT OF BUSINESS

The FMLA covers private employers who employ 50 or more employees within 75-miles during 20 or more work weeks in either the current or preceding calendar year. But what the Act fails to define is how that 75-mile area is measured. Is it as the crow flies? Is it using road surface miles? Is it using major roadways only?

The Department of Labor enacted a regulation defining the mileage as 75 "surface miles, using surface transportation over public streets, roads, highways, and waterways." But in a recent case, *Bellum v. PCE*, the employee, Bellum, claimed that the DOL's regulation should be ignored because by not defining how to measure the mileage in the Act, Congress "implied that it should be measured as the crow flies."

The Court disagreed, hypothesizing: Suppose that Company A had its headquarters along the south rim of the Grand Canyon and a branch office on the other side only 25 miles away as the crow flies. Suppose further, quite plausibly, that the shortest distance between the two by public roads is 120 miles. Now, imagine that Company B has its headquarters next to a straight-line interstate highway and a branch office 80 miles away also right along the interstate. Under [Bellum's] reading, Company A would be bound by the FMLA, but Company B would not be. [And that] makes no sense.

Choosing to "make sense," the Court ruled that the Department's regulation was a permissible construction of the statute. Thus, employers should measure the miles in terms of surface road miles using public roads (if available) and not how the crow flies.

**Practical Tip:** Employers questioning their proximity to other work sites should throw away their maps and pull out their computers. This Court actually cited the employer's use of mapquest.com as persuasive evidence in determining how far it was between work sites. *Bellum v. PCE Constructors, Inc.*, 407 F.3d. 734(5th Cir. 2005).

## WHAT IF, UPON RETURN, MACARTHUR QUICKLY APPLIED FOR FMLA LEAVE?

To be eligible for FMLA leave, an employee must have been employed by his or her employer for at least 12 months, and have worked at least 1,250 hours during the previous 12-month period. While seemingly straight-forward requirements, an issue was recently raised as to whether an employee could "tack" two employment periods together to meet that year requirement.

In *Rucker v. Lee Holding Co.*, Rucker worked for Lee Holding for five years during the mid-90s before quitting. Years later, on June 5, 2004, Rucker returned to the company. He then submitted a request for FMLA leave on January 20, 2005, only 8 months after his return. The company rejected his request because, even though Rucker

had worked 1,250 hours since returning, Rucker had yet to work for the company for a full year during the current employment period. Rucker argued that the company should have included his previous employment period when making that decision. Rucker cited the FMLA's regulations that state that "the 12 months an employee must have been employed by the employer need not be consecutive months." Was Rucker entitled to FMLA leave?

Despite the seemingly clear regulation, the Court's answer was "no." The Court determined that because the regulation "did not give any indication that the two periods of employment, separated by conceivably limitless amount of time, [could] be grouped to make an otherwise ineligible employee eligible." Instead, in the Court's opinion, the regulation was intended to prevent brief interruptions in an employee's attendance from affecting an employee's eligibility, and ensure that non-consecutive months are adequate to establish eligibility for an employee who maintains an on going relationship with their employer. The Court concluded that it "could not imagine that [Congress] would draft a statute allowing an employee to leave an employer for years or decades, only to return and immediately become an FMLA eligible employee." Too bad the Court's decision does not establish an exact period of separation needed to break the employment relationship for purposes of the FMLA's 12-month requirement—that's left for another case. 2006 WL 598137 (March 2006).

**Practical Tip:** This case reinforces how stringently courts will apply the 1,250-hour/12-month requirements for FMLA eligibility. In addition to this case, which limited the 12-month requirement to the current employment period only, another court determined that an employee was not FMLA-eligible even though the employee had worked 1,249.6 hours in a year. Accordingly, before granting FMLA leave, employers should closely review both of these initial requirements to make sure that the employee satisfies them.

## LEARN THE LATEST DEVELOPMENTS IN EMPLOYMENT LAW

WCHRA'S Spring Conference presents EMPLOYMENT LAW UPDATE 2006, Wednesday, April 19, 2006, 8:00 am to 12:00 Noon, Two Rivers Convention Center, 159 Main Street, Grand Junction, CO 81501. The speakers are Betty Bechtel and Michael Santo, editors of *The Employer's Advisory*. There's still time to sign up! See [www.bechtelsanto.com](http://www.bechtelsanto.com) for details and sign-up form.

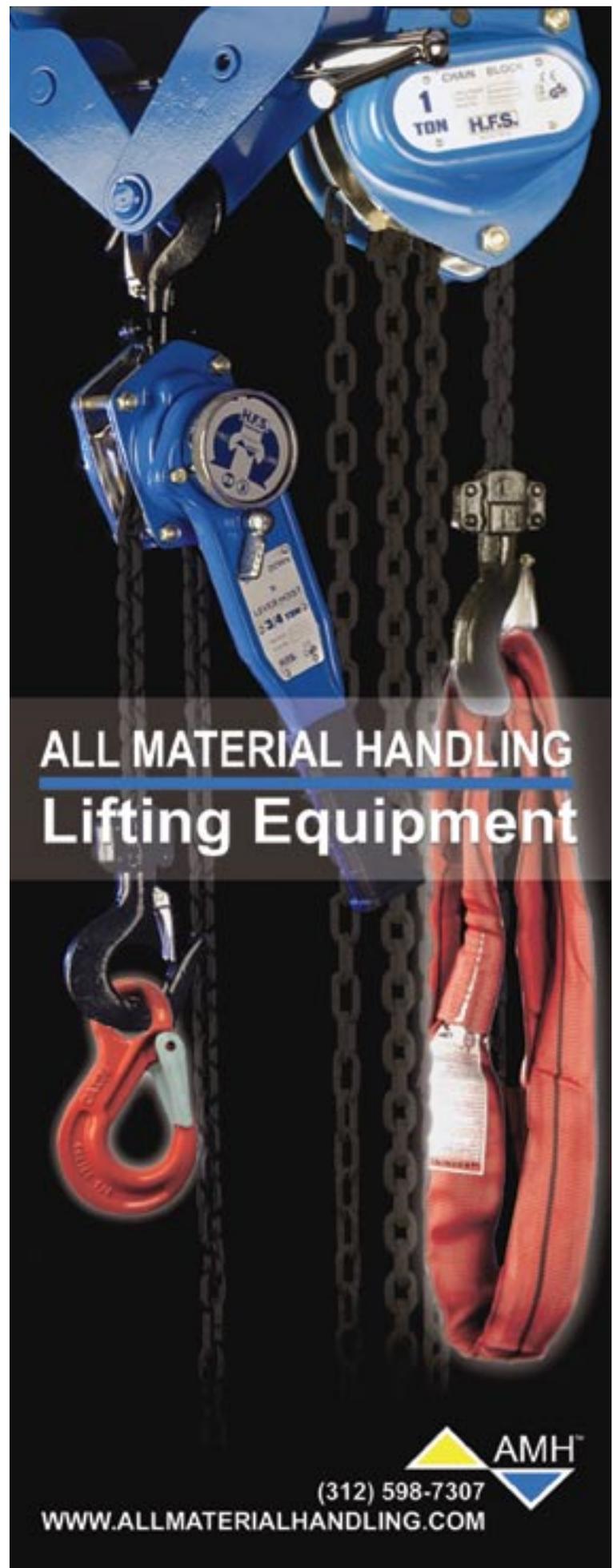
## Q & A

- Q. We want to make sure that employees we hire to work in the warehouse are physically fit to do this strenuous job. So we have candidates do 10 pull-ups, 50 sit-ups, a 220 yard run, and walk twenty feet carrying 100 pounds, to test physical fitness. Is there any problem with us using this test for all new candidates?
- A. Potentially. If candidates within a protected status, like women, older workers, or disabled workers, are excluded from employment by the test at a significantly higher rate than candidates not within the protected status, then the test has an "adverse impact" on protected status. Title VII, the ADEA, and the ADA prohibit adverse-impact discrimination, unless the employer can prove that the skills or qualifications measured by the test are job-related and consistent with

business necessity. Be sure you can verify the test satisfies these requirements, or don't use it to make employment decisions. U.S. v. City of Erie, PA, 2005 WL 3610687(W. D.Pa.,2005)

- Q. When an employee gives us two-weeks' notice that he or she is quitting, can we let the employee go immediately without having to pay two-weeks' wages?
- A. Yes, unless the company has promised the employee through a written policy, verbal statement or established practice that it will not do this. Neither federal law nor Colorado state law requires an employer to retain an employee after the employee has given notice of quitting. Also, these laws do not require an employer to pay severance pay in lieu of retaining the employee for the two weeks. But if the company has promised that it will give employees two-weeks' notice before termination, or no termination without just cause, then terminating employment early because the employee has given notice of quitting will likely be a breach of express or implied promise. The company could be liable for the damages suffered by the employee as a result of that breach.
- Q. Hourly employees get 30 minutes off for lunch, which is unpaid time. We provide a lunch room and require that they remain in the building. They are not on-call during the lunch break, but occasionally an employee answers a customer's phone call or gives a delivery person assistance. We don't pay for these minor interruptions. Is that OK?
- A. Bona fide meal periods are not work time and do not need to be compensated. Ordinarily, 30 minutes or more is long enough for a bona fide meal period, and the employee can be required to remain on the premises. But DOL regulations state that an employee "must be completely relieved from duty for the purposes of eating regular meals." Courts have ruled that job-related interruptions during lunch break do not render the entire break period compensable, if the period is used" predominantly for the employee's benefit." In plain English, minor, infrequent interruptions (like answering one phone inquiry) don't count. But to avoid a courtroom dispute over pay for lunch breaks, the best practice is to not allow non-exempt employees to perform any work on an unpaid lunch break. No employer wants a jury to determine what" predominantly" means. 2005 WL3110691; 29 CFR 785.19.

*THE EMPLOYER'S ADVISORY is published quarterly by BECHTEL & SANTO, LLP, 205 N. 4 Street, Grand Junction, thColorado 81501, (970) 683-5888. Legal editors are Betty C. Bechtel and Michael C. Santo. The publication isdesigned to provide information about legal issues facing employers, but not to provide legal advice with regardto specific circumstances. Readers with legal questions should address them to their legal counsel.*



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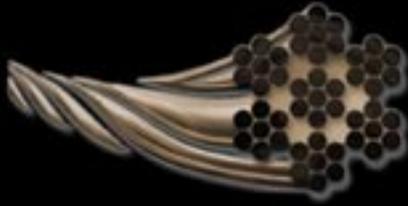
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### WRCA Promotion Announcement

#### James W. Allaman

Wire Rope Corporation of America is pleased to announce the promotion of James W. Allaman to Vice President of International Sales. In this challenging capacity, Mr. Allaman will oversee all South American, Asian and European wire rope product sales. Starting his career with WRCA in 1974, Jim has held various positions during his tenure including District Manager in Chicago, General Manager of Tri-State Rigging and Supply, Manager of the WRCA International Division as well as his former assignment of Director of Mining Products.



Wire Rope Corporation of America is the largest manufacturer of wire rope in the Western Hemisphere. Through domestic and global manufacturing it distributes wire rope and fabricated products worldwide. WRCA is the only major wire rope manufacturer in the world to be API certified, QPL Qualified, and ISO-9001:2000 registered, the industry's highest quality standards. ISO-9001 contains requirements for quality assurance in design, development, production, installation and servicing. Unique to the 9001 level is product design, an element critical to quality wire rope production.

### WRCA Hiring Announcements

#### Peter Lang

Wire Rope Corporation of America, Inc. (WRCA) is pleased to announce the addition of Peter Lang as District Sales Manager of the Australian territory. Mr. Lang has extensive experience in the marketing of technical products as well as developing distributor networks in Australia, Asia and the United States. Peter graduated from the Sydney University of Technology with a diploma in Structural Engineering.

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#### Blake Chandler

Wire Rope Corporation of America is pleased to announce the hiring of Blake Chandler as Director of Mining Products. Blake is a graduate of Florida Southern College with dual degrees in International Business and Finance. He has been involved in international business development for the past 10 years, including a previous employment period in international sales with WRCA. John Josendale, Senior Vice President, remarks, "We are extremely excited to have Blake rejoin the WRCA sales team. His knowledge and expertise will be a great addition to our team." Blake will be based at the corporate headquarters in St. Joseph, MO.



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## LAEDC ECONOMICS CORNER

*Continued from page 17*

consume 32 million MT, a 10% increase, leaving 18 million MT (or 2.7%) more for the rest of the world to use. On the supply side, global steel output has risen by 7% thus far in 2006. China's output has increased by 19% (or 25 MMT) and now accounts for 33% of the global total.

What will happen to the prices of steel products and other industrial materials going forward? On one hand, rising costs of scrap steel and iron ore (and alumina and copper treatment charges, etc.) seem likely to put a floor under finished product prices. However, China's trade balance in industrial materials—including steel—is turning more positive as its domestic production capacity increases. Example: U.S. finished

steel imports from China are up by 67% this year after a 26% increase during 2005. This new trend will surely change markets and pricing dynamics for many commodities.

Outlook: Watch trends in the major consuming industries for signals on commodity prices. Prices of products used in residential construction and perhaps automotive likely will weaken. On the upside, production of commercial aircraft is growing briskly, along with nonresidential and infrastructure construction. And anything tied to oil exploration, drilling and production will continue rising as long as prices stay so high. Beyond these industry-specific trends, watch the global economy. Commodity prices won't come down (much) unless global economic growth slows markedly. Maybe next year?

This material was prepared by the Los Angeles Economic Development Corporation: Nancy D. Sidhu, Vice President & Senior Economist  
Candice Flor, Research Project Manager

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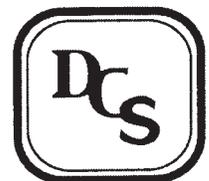
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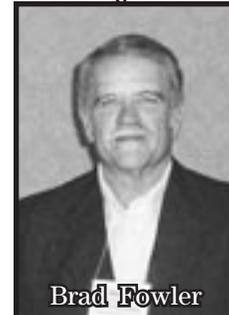


**John D. Josendale**

**Career Summary:** Senior Vice President Sales & Fabricated Products. John has been involved in the wire rope business for over 30 years. Started as a district sales manger and has worked as regional sales manager, manager of mining products, group president wire rope products and most recently as senior vice president responsible for sales of all products and fabricated products sales and operations.

John has worked with numerous committees and is the current Chairman of the Wire Rope Producers Committee in Washington DC

He and his wife Jennifer have 3 children. Chris, in the army currently serving in the Middle East, Jamie a junior in high school and Lauren an eight grader. He is very involved in his community and enjoys golf, working outdoors and working with youth athletics.



**Brad Fowler**

My name is Brad Fowler and I'm the general manager of D&M Wire Rope in Grand Jct., Colorado. I have been in the rigging industry for 33 years. I started in a rigging shop moved to Grand Jct., CO and help start D&M.

I have been married for 35 years to my wife Millie and we have one son John. He is now married and they have blessed us with a grandson.

I previously served on the AWRP Board of Directors from 2002-2005 and would like the opportunity to serve again.



**Jim Stradinger**

Co-Owner and Executive Vice President of Sales and Marketing, Holland 1916 Inc.

Holland 1916 currently provides marking solutions for the members and suppliers of AWRP. Holland innovated on-site, on-demand printing solutions for vinyl tags and provides metal marking machines for increased flexibility on metal tags. These innovations have drastically reduced tagging costs, reduced on-hand inventory of tags, improved delivery time, increased traceability and simplified private labeling. Holland 1916 has been a member of the AWRP for 17 years. Jim, a graduate of Baylor University, is married to his wife Janis; they have four children – Jack, Sophie, Whit, and Quinn.



**Michael Rothermund**

Michael was born in Germany in 1962. After High School and college he took a position as an apprentice at Kulenkampff + Konitzki in Bremen, Germany. He finished with a degree in Import/Export Trade. In 1986 Michael transferred to Kulkoni, Inc., in Houston, Texas, taking a position in sales. After literally learning the ropes he has traveled the country extensively for Kulkoni, and he has served as Sales Manager for a number of years. Michael became a US citizen in 2003, and he is now in his 21<sup>st</sup> year with the company. He currently holds the position of Vice President.



# St. Petersburg, Florida April 2006



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# REPORT ON OUR TRIP TO EUROPE

by Don Sayenga

In June 2006, Carlene and I had a wonderful opportunity to travel to Europe in connection with celebrating the 200th birthday of John A. Roebling, founder of the U.S. Wire Rope Industry. We went first to Potsdam, Germany where a conference was held June 9-10 in Roebling's honor. It was followed by a ceremony June 11-12 at his home town Mühlhausen. Everybody had



a pleasant surprise when two of JAR's direct descendants from America, Ted Schildge and Kris Roebling, were present at Mühlhausen.

The Potsdam Conference was a great success with 64 attendees. It was conducted by Prof. Dr. Andreas Kahlow of the engineering staff at the local technical university. The site was a regional historical society building in the center of Potsdam. At the conclusion, almost everyone adjourned the next day

to Mühlhausen, several hours away eastward. As the entire program at both places was in the German language, I was the only person permitted to give a speech in English.

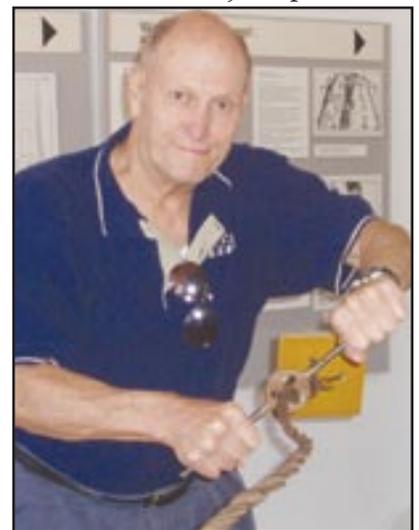


The best presentation was by Ludwig "Larry" Stein, an American engineer who worked on the two main rehab projects of the Brooklyn Bridge. He is fluent in German as he was born in nearby Eschwege.

My own interests were fixed on Dr. Nele Güntheroth's paper Rößling's weg zum Baumeister. She's employed by the Berlin Museum and is a super detective who has managed to discover all sorts of factual stuff about JAR's life in the seven years 1824-1831 before he came to the USA. Her paper put

focus on the fact that JAR did not become an engineer officially in Prussia because he never passed the final exam - she doesn't know why he didn't. He studied at the Berlin Bauakademie for 10-1/2 months (15 April 1824 - 1 March 1825) then went to Arnsberg, Westfalen, for on-the-job experience which began in May 1825 and lasted until October 1828. He came to the USA in the summer of 1831.

Prof. Dr. Andreas Kahlow and Dr. Eberhard Grunsky have found all kinds of literature, drawings etc describing the advent of suspension bridges in Prussia, including JAR's early ideas for building wire bridges that never came to fruition. One of Dr. Kahlow's pupils, Göran Werner, gave a good presentation about JAR's Niagara Gorge bridge. As for me, I told everyone a revelation that that there may have been 14 JAR bridges of which only 9 are normally identified. There were eight other papers about modern bridgebuilding theories and efforts presented. A female university professor, Iris Roebling (who is not a direct descendant) has published a new German translation of JAR's 1831 immigration diary which she was selling at Potsdam.



I met with four members of the OIPEEC Board of Directors: Martin Dohm from South Africa, Jean Marc Tessier from France, The editor Dr. Isabel Ridge, and the Vice President Roland Verreet. Among

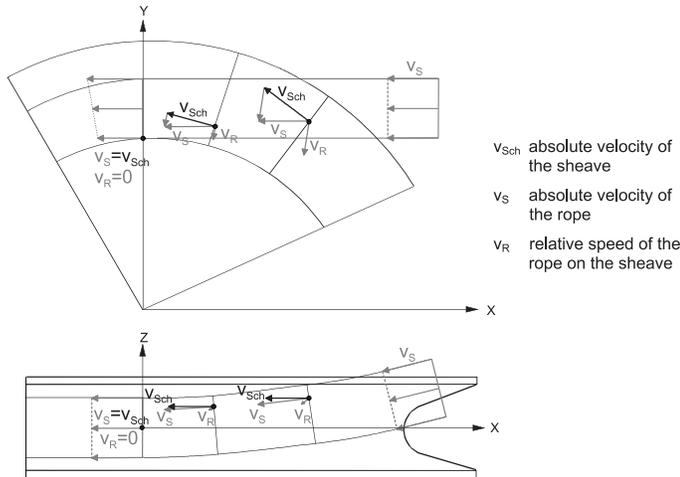
many other things we discussed the achievement of Mike Wallace and Knut Buschmann establishing co-member status in OIPEEC for all AWRF members. Departing Potsdam, Carlene and I traveled with Roland his wife Regine to the Harz Mountains to visit the museum at Clausthal-Zellerfeld where the mining supervisor W.A.J. Albert perfected his stranded wire ropes in 1834. The exhibit at the museum is really good. All things considered it was a great trip, despite the hoards of soccer fans who were there attending the World Cup.

# Reduction in service life of wire ropes running over sheaves with angular offset

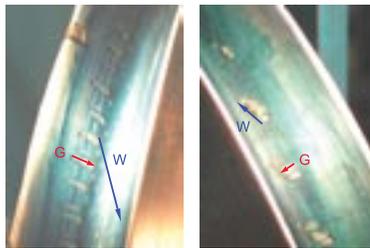
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When tensile force is applied, **high contact pressure** arises at the points where the rope and sheave flange touch, and this pressure grows with increasing lateral deflection  $\phi$ . A major factor affecting the pressure, in addition to the nominal force itself, is the length along which the rope is in contact with the sheave flange. The contact length increases with smaller groove throat angles  $\gamma$  (Figure 5b), reducing the pressure.

Due to the kinematic characteristics of the rope and the sheave (Figure 3), the rope performs a sliding and rolling movement on the sheave flange when running over the sheave, from the point of contact with the sheave flange to the groove root (Figure 4).



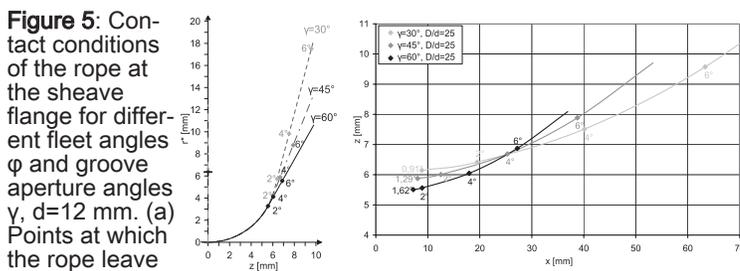
**Figure 3:** Relative speed of the rope on the sheave flange.



**Figure 4:** Sliding (G) and rolling movement (W) of the rope on the sheave flange.

In the process, the rope is subjected to **sliding and rolling wear**. The sliding wear is determined by the friction force and the wear distance of the various

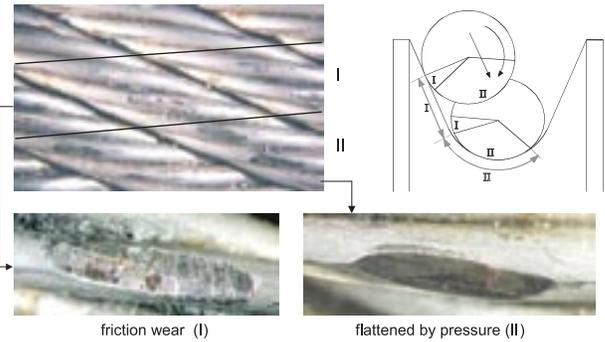
rope profiles on the sheave flange. The wear distance, which can be determined based on the position of the point of contact on the sheave flange, increases with a greater fleet angle  $\phi$  and a smaller groove throat angle  $\gamma$  (Figure 5a). Therefore, Neumann (1987) expects a significantly greater rope deterioration with smaller groove throat angles  $\gamma$ , without taking the reduced pressure on the sheave flange (c.f. Figure 5b) into account.



**Figure 5:** Contact conditions of the rope at the sheave flange for different fleet angles  $\phi$  and groove aperture angles  $\gamma$ ,  $d=12$  mm. (a) Points at which the rope leave the sheave flange; (b) Contact length of the rope at the sheave flange.

Various areas of deterioration can be identified on the rope surface (see Figure 6). The wire ends in area I perform mainly sliding movements and are damaged by

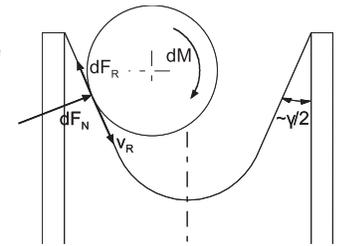
friction wear. The wire surfaces in area II are subject to a rolling movement and are flattened by pressure.



**Figure 6:** Deterioration of the rope surface.

The friction force generated in opposition to the relative speed between rope and sheave on the sheave flange also acts as torque upon the rope (see Figure 7).

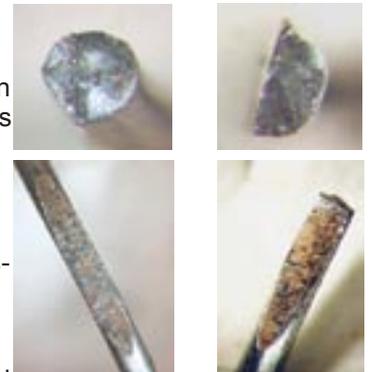
**Figure 7:** Friction force and torque applied to the rope on the sheave flange.



Under the impact of the torsional moment, the rope profiles on the sheave flange are twisted in relation to the profiles fixed in the groove root by surface pressure.

The type of **torsional stress** generated on the rope in this process depends on its direction of lay. This determines whether the rope is twisted or untwisted. These types of stress, which are additionally exerted upon the rope as a result of lateral deflection, subject wire ropes to additional tensile, bending and torsion stress. The displacement of the strands and wires during the bending and twisting of the rope cause wear and stress at the contact points of strands and wires. Abrasive wear reduces the cross-section of the wire and frequently results in wire breakage at or around the area of its smallest perimeter (see Figure 8).

**Figure 8:** Abrasive wear of wire ends.



The service life reduction in the case of angular offset is caused by a large number of interacting stress factors and damaging effects. Many impact parameters, such as wear or wire cross-sections, vary over time. The service life of ropes subjected to lateral deflection is therefore determined – as in many earlier service life studies for running ropes (Feyrer, 1981, 1984 and 1997) – by performing fatigue bending tests.

### 3 Fatigue bending tests

More than 300 systematic and reproducible fatigue bending tests designed to quantify rope service life and the development of wire breaks were performed on 6 test ropes subject to lateral rope deflection.

#### 3.1 Test parameters

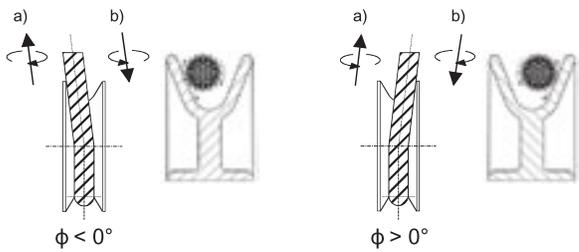
Along with the rope-specific parameters:

- rope construction and
  - rope diameter  $d$  ( $d = 12$  mm,  $16$  mm)
- the following geometric and stress parameters of the rope

drive were varied during the fatigue bending tests:

- fleet angle and deflection direction  $\pm\phi -7^\circ < \phi < 7^\circ$
- groove throat angle of the sheave  $\gamma \gamma = 30^\circ, 45^\circ, 60^\circ$
- D/d ratio  $D/d = 12.5; 25$
- rope tensile force  $S \quad S = 8.4 \text{ kN} - 50 \text{ kN}$
- bending length  $l \quad l = 30d - 450d$ .

Another parameter that was examined is the direction of the angle offset, i.e. the direction  $-\phi$  or  $+\phi$ , in which the rope on the sheave is laterally deflected (Figure 9).



**Figure 9:** Definition of the rope's angular offset direction and direction of rope twist (a) rope leaving the sheave and (b) rope running on the sheave.

The bending fatigue machine deflects the rope laterally by inclining (Figure 10a) or twisting the test sheave (Figure 10b).



(a) "Laschen" tests with single bending cycle EB (b) "Käfig" tests with double bending cycles DB

**Figure 10:** Lateral rope deflection (a) Tests with inclined sheave; (b) Tests with twisted sheave.

### 3.1 Investigated rope constructions

The impact of the rope construction with angular offset was tested using six ordinary right-hand lay ropes with diameter of  $d = 12 \text{ mm}$  and  $d = 16 \text{ mm}$  (see Table 1).

Test rope	A	B	C	D	E	F
Rope construction	Warrington SES + 8x19	Warrington FE + 8x19	Warr. Seale SES + 6x36	SES + 34x7	Warr. Seale SES + 6x36	FE + 18x7
Rope designation according to EN 12385-4	8x19 W-IWRC	8x19 W-FC	6x36 WS-IWRC	34(M)x7-WC	6x36 WS-IWRC	18x7-FC
Nominal rope diameter d [mm]	12	12	12	12	16	16
Figure						

All test ropes: Nominal wire strength  $R_0 = 1770 \text{ N/mm}^2$

**Table 1:** Test ropes.

Test rope ABCDEF Rope construction Warrington SES + 8x19 Warrington FE + 8x19 Warr. Seale SES + 6x36 SES + 34x7 Warr. Seale SES + 6x36 FE + 18x7 Rope designation according to EN 12385-4 8x19 W-IWRC 8x19 W-FC 6x36 WS-IWRC 34(M)x7-WC 6x36 WS-IWRC 18x7-FC Nominal rope diameter d [mm] 12 12 12 12 16 16 Figure

### 4 Results of the fatigue bending tests

The fatigue bending tests were first conducted with an inclined sheave and the results were evaluated without taking the offset direction into account. Table 2 shows the respective loss of endurance of the tested ropes A through F in percent, which was determined during the tests using an inclined sheave.

Test rope	Rope construction	d [mm]	Loss of endurance at a fleet angle of:			
			$\phi = 1.5^\circ$	$\phi = 2^\circ$	$\phi = 4^\circ$	$\phi = 6^\circ$
A	Warrington SES + 8x19	12	17%	22%	39%	53%
B	Warrington FE + 8x19	12	9%	12%	22%	31%
C	Warrington Seale SES + 6x36	12	6%	8%	16%	23%
D	SES 34x7	12	19%	24%	42%	56%
E	Warrington Seale SES + 6x36	16	11%	14%	27%	-
F	FE + 18x7	16	22%	28%	48%	-

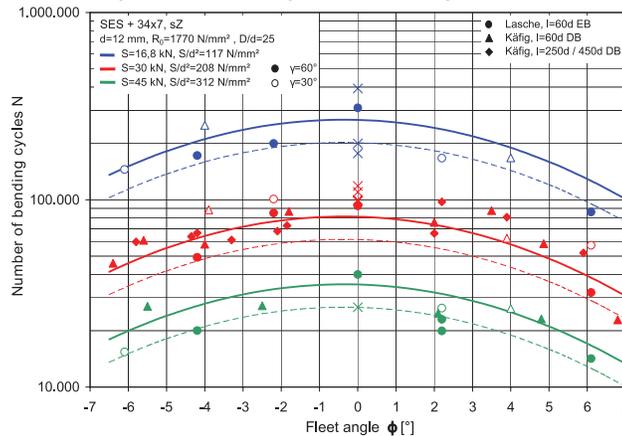
**Table 2:** Loss of endurance (test ropes A-F).

The most significant loss of endurance can be detected with rope types D (which has no torsional tendency) and F (which has a low torsional

tendency). One-layer round strand ropes lose less endurance. These values vary between 16% and 39% at a fleet angle of  $\phi = 4^\circ$ .

The tests using an inclined sheave also served to determine whether the direction of angular offset is an influencing factor. Based on the deviation of the breakage frequency from the statistically established random frequency of 50%, the service life was estimated for the offset direction where no breakage had yet occurred. For the two Warrington ropes A and B, a different service life was predicted with offset angles of  $\pm 2^\circ$  and  $\pm 4^\circ$ , respectively. This estimate was tested using a twisted sheave.

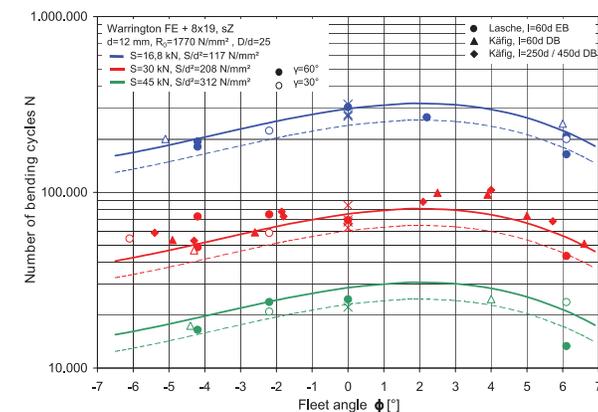
Figure 11 shows all the test results with inclined and twisted sheaves for rope D at a diameter ratio of  $D/d = 25$ . The solid lines show the regression, the broken lines indicate the 10% limit of the test results. Rope F, which is also a multi-layer spiral round strand rope, has a similar pattern of test points and regression lines.



**Figure 11:** Number of bending cycles up to rope failure in relation to the fleet angle  $\pm\phi$  (rope D, SES + 34 x 7, sZ, d = 12 mm).

The tests confirmed the impact of offset direction on the service life of Warrington rope B (see Figure 12). The service life increases when

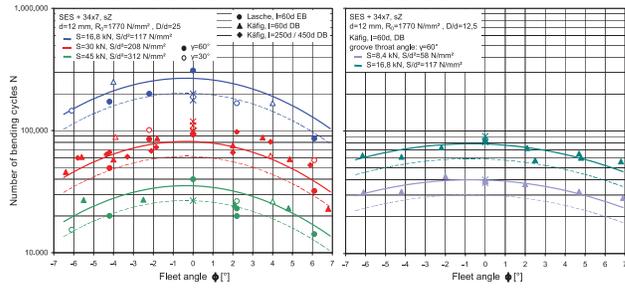
the rope is deflected to the right, i.e. when the fleet angle values are positive. Tests of the other Warrington rope A showed a similar pattern of the number of bending cycles up to rope failure in relation to the fleet angle.



**Figure 12:** Number of bending cycles up to rope failure in relation to the fleet angle  $\pm\phi$  (rope B, Warrington FE + 8 x 19, sZ, d = 12 mm)

The impact of the D/d ratio on the loss of rope endurance in the case of angular offset becomes evident when looking at

the bending cycle numbers to rope failure in relation to the fleet angle  $\pm \varphi$  established for different diameter ratios D/d (Figure 13).



**Figure 13:** Number of bending cycles up to rope failure in relation to the fleet angle  $\pm \varphi$ . left: D/d=25, and right: D/d = 12.5 (rope D, SES + 34 x 7, sZ, d = 12 mm).

The example of rope D demonstrates that there is a smaller reduction in service life in relation to fleet angle in the right-hand diagram (with a D/d ratio of 12.5) than in the left-hand diagram (with a D/d ratio of 25). This trend was confirmed for all rope constructions.

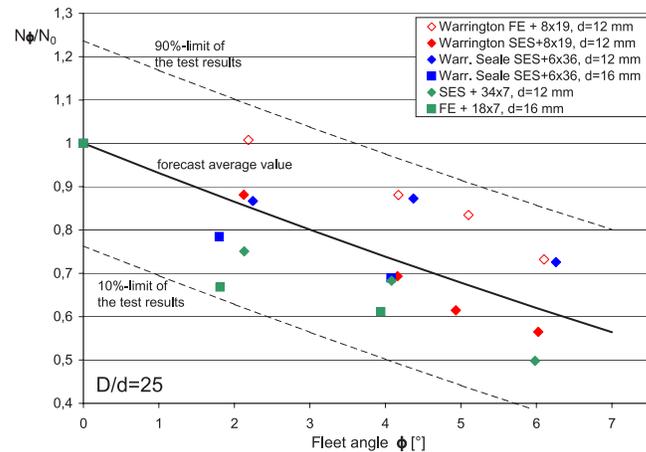
For the purpose of regression analysis, a third-order equation was set up which can be used to determine the service life for ropes of any type at fleet angle values  $\pm \varphi$

$$\lg N_{\varphi} = c_0 + c_1 \cdot \varphi^3 + c_2 \cdot \varphi^2 \cdot \frac{D}{d} + c_3 \cdot \varphi \quad \text{where } c_0 = \lg N_0. \quad (1)$$

This equation includes the two major factors influencing rope service life reduction with angular offset: fleet angle  $\varphi$  and D/d ratio and is based on the service life equation set up by Feyrer (2000) where  $\lg N_0 = c_0$ . The regression coefficients determined for ropes A-F using Equation (1) could not yet be confirmed for many identically designed ropes and thus apply exclusively to the tested ropes. In order to find a practical application for the results, the service life reduction of all tested ropes was aggregated and an equation for calculating the service life of any type of ordinary lay ropes was formulated. Equation (2) applies to the studied range of influencing parameters

$$\frac{N_{\varphi}}{N_0} = 1 - \left[ \left( 0,00863 + 0,00243 \cdot \frac{D}{d} \right) \cdot |\varphi| - 0,00103 \cdot \varphi^2 \right]. \quad (2)$$

Figure 14 shows the forecast average value enabling a rough estimate of the supposed service life reduction of any type of ordinary lay ropes at D/d = 25 – as well as the 10% limit of the test results. For a reliable forecast the large spread must be taken into account.



**Figure 14:** Ratio of endurance  $N_{\varphi}/N_0$  of the tested ropes A-F, D/d = 25.

## 5 Summary

In the course of the tests, which were carried out for the first time with bending cycles up to rope failure, a significant reduction of service life up to 48% at a fleet angle of  $4^\circ$  was determined.

Moreover, the main factors determining service life with angular offset were established. Along with the expected influence of the fleet angle  $\varphi$  additional and previously unknown influencing parameters were also established. The D/d ratio, for example, was found to have a substantial impact on the reduction of service life of ropes with angular offset. The tests also showed that the groove throat angle is of minor importance – despite the popular opinion that a smaller throat angle substantially reduces service life.

The pattern of the bending cycle numbers up to breakage as well as the values of service life reduction in relation to fleet angle  $\pm \varphi$  show a wide variation for different rope types. Multi-layer spiral round strand ropes experienced the most significant reduction in service life with angular offset.

By systematically evaluating the test results by means of linear multiple regression, a calculation method based on the lifetime equation by Feyrer (2000) was established, enabling the quantification of the service life pattern of different rope constructions in relation of fleet angle  $\pm \varphi$ .

On the basis of all tested ropes an equation was set up, which can be used to forecast the service life of any type of ordinary lay ropes. The area of rope inspection also included investigations of rope damage and the applicability of common discarding criteria such as the number of visible wire breaks. It was established that the maximum number of wire breaks defined as a discard criteria in DIN 15020 (1974) can also be reliably applied to ropes with angular offset running under a predominantly constant load.

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# Message from the President

Continued from page 1

Our Summer Board of Directors' meeting is being held in Baltimore at the Inner Harbor July 14th and 15th. This meeting is our "Long Range" planning meeting where we look at where the association is going for the next three to five years. We have a very specific format for our long range planning process which is helpful to the board members for setting our future direction. This meeting in Baltimore will also serve to evaluate Baltimore's Inner Harbor as future meeting location.

Our Technical Committee, headed up by Don Pellow, will be having their Summer meeting August 3rd and 4th at our World Headquarters in Novi, Michigan. The meeting is open to any members so if you are interested in attending please contact either Don Pellow or Jeff Gilbert. I attended my first Technical Committee meeting in February and I must say that the technical brain power in the room was truly impressive. It was extremely interesting to see our most important committee at work.

In the Fall issue of Slingmakers (No. 107) I reported on a presentation the AWRF and the Committee of Domestic Steel Wire Rope and Specialty Cable Manufacturers intend to make to the Allegheny Portage Railroad National Historic Site in Pennsylvania this Summer. It has been determined that John A. Roebling's first wire rope manufactured was used to haul the railcars up the inclined planes. Loos & Co., Inc. has manufactured a modern day replica of that 1 1/4" 7 X 19 wire rope. Tentatively the date for the presentation has

been set for Thursday, August 17th. All interested AWRF members are welcome to attend. Please contact me for specific details. For more information on the site visit the National Park Services web site [www.nps.gov/alpo/](http://www.nps.gov/alpo/).

Our Fall General Meeting will be held on the Riverwalk in San Antonio, Texas. This meeting will celebrate AWRF's 30th year anniversary. Our program for the meeting has not yet been finalized but I'm sure it will be a special one not to be missed. San Antonio was the location of our Fall meeting in 1995. That meeting was my first time in San Antonio and I personally look forward to going back.

In closing, I would like to thank all the members who volunteer their time to serve the Association. Without our volunteers the Association never would be celebrating its 30th year! Since this is my last "Letter from the President" I'd like to take the opportunity to say it has been an honor and privilege to serve our Association. Over the past 9 years of serving on the Board of Directors I have had the opportunity to meet and get to know so many wonderful individuals who have served with me. They have not been customers, they have not been competitors, they have been individuals who have a common cause, the advancement of our great Association. I am positive that the continued success of the AWRF is totally dependent upon the volunteer spirit of our members. I look forward to seeing as many of you as possible in San Antonio!

Sincerely,



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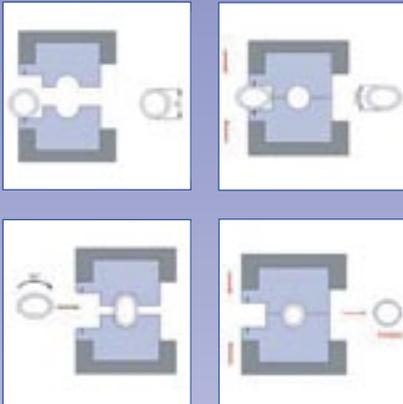
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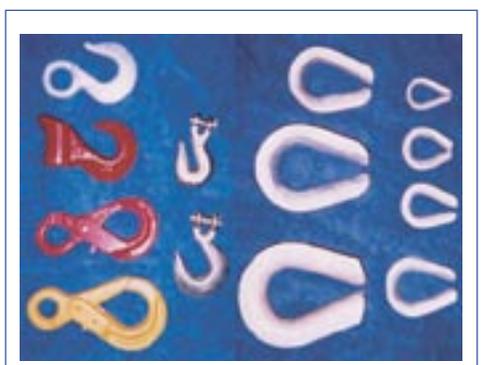
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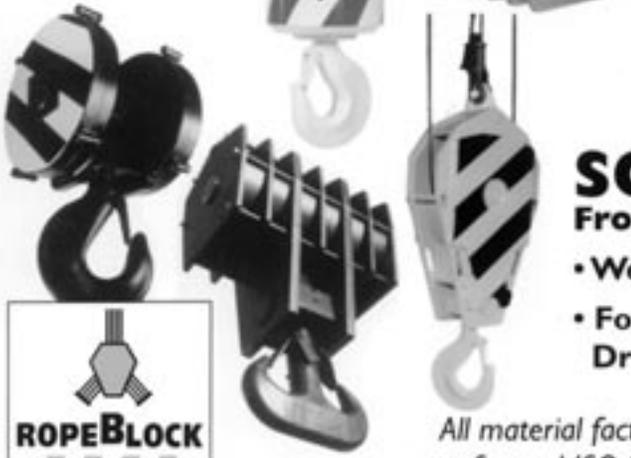
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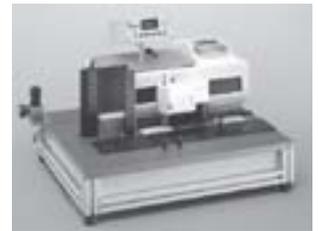


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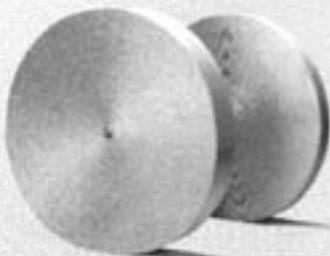
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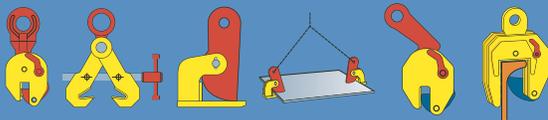
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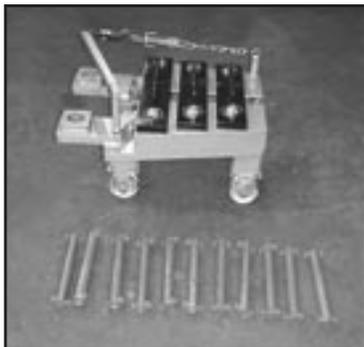
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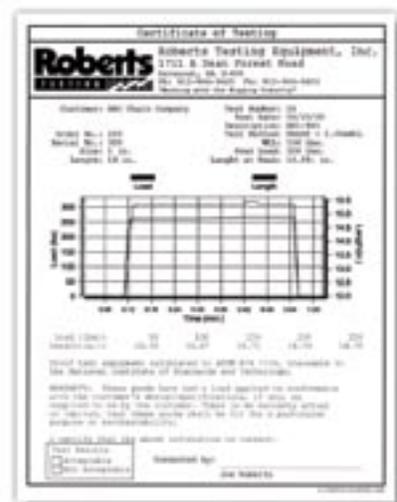
Web Grip. Capacity: 6" and 12" webbing



3,000,000 lb. Test Bed at Lowery Brothers in New Orleans, LA



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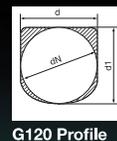
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