



The Professional Rigger

Volume 9 Number 2

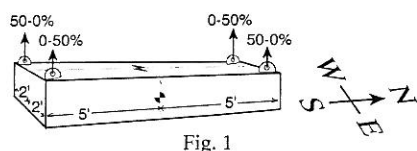
Circulation 5,020

July 1994

TECHNICAL NEWS

Sometimes 4 = 2.

When making lifts using various pick points on a load, the rigger must review the weight and the location of the load's center of gravity (CG) to determine the amount of load he can anticipate at each pick point. The distribution of the load's weight to the pick points is dependent on the proportional split north:south and west:east



(how close or far the "pad eyes" are from the CG) and if the slings are equal or unequal in length (especially a 4-leg bridle assembly).

When using a 4-leg bridle on a load with a concentric CG (Fig. 3 #4), we should always assume that only 2 legs are making the lift. The chance is great that 1 of the 4 slings is shorter or longer than the other 3, which will cause the shortest cross-corner pair (A/C or B/D) to lift the load first, resulting in one pair carrying 100% of the load's weight. The remaining cross-corner pair may look tight, but in reality have 0% load. If we rig this load with a 4-leg bridle sling assembly expecting each leg to carry only 1/4 of the load, and that's all the slings can legally carry, two slings may actually be carrying double their anticipated load - OVERLOAD!

An element which complicates the rigger's life is a load with an

eccentric or offset CG. If we plan to attach four slings to the offset CG load in Fig. 2 below and the sling at pick point D is shorter than the one at C, then the load will be carried by slings A, B & D (3-leg lift).

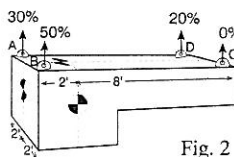


Fig. 2

On the North side of the load, the sling attached at D will carry approx. 20% of the load's weight (inverse proportion to distance) and the sling at C will have 0% load.

Pick point B will carry 50% of the load's weight since B & C (East) are equally spaced from the CG, as are A & D (West). Since C has 0 load, then B must carry the entire East portion of the load, in this case 50%. With D carrying 20% and B 50%, that leaves the remaining 30% to A. Should the sling at C happen to be shorter than D's, then the load distribution would be: C = 20%, D = 0%, A = 50% and B = 30%. If the slings used at points A & B (South) are equal length and the slings at C & D (North) are equal

Pick Points and CG Location

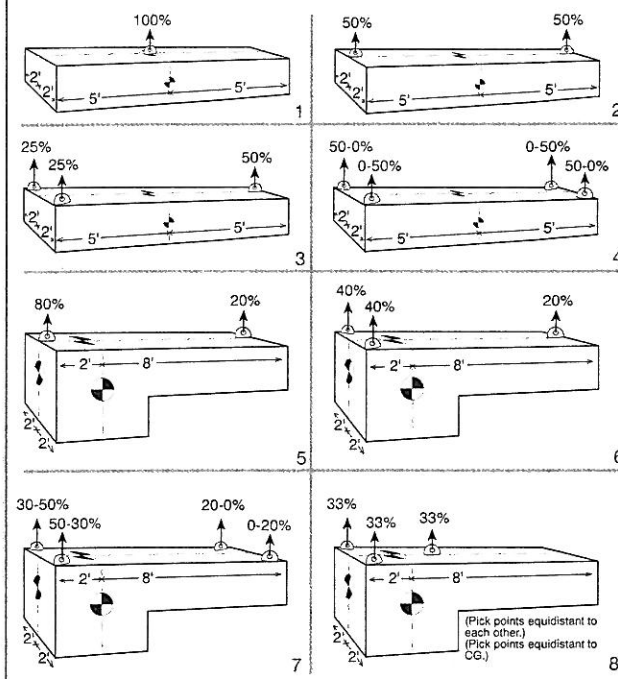
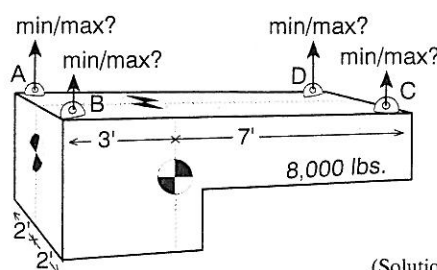


Fig. 3

length (converging over the CG), only then would the distribution of weight be: A = 40%, B = 40%, C = 10% and D = 10%. We should realize the possibility of the different loading at A, B, C & D. Pick points A & B can have 30-50%, and C & D 0-20% each. Think of the potential for overloaded rigging gear!

Rigging Workshop Assignment
Try your hand at determining the minimum and maximum loads that we could expect for the following load's pick points. (For this workshop, the sling length-to-height ratio is not a concern.)

RIGGING WORKSHOP



(Solution pg. 3, col. 3)

CLIENT NEWS

Sandia National Laboratories

An in-depth series of overhead crane, hoisting and rigging training programs are being conducted for employees at Sandia's New Mexico and California locations. Some of the classroom topics include inspections, maintenance, moving loads, load weight estimation and rigging configurations. Ms. Janet Iafonaro is the organizer for these programs which are scheduled through December 1994.

United States Fidelity & Guaranty Co.

WRRC presented a two day program addressing basic rigging and crane operation techniques for the Loss Control Managers at USF&G. Mr. Robert Tetzlaff coordinated the program which was conducted at USF&G's Mt. Washington Conference Center in Baltimore, MD.

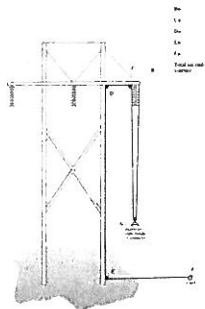
Price Ahtna

A rigging gear inspection and user hardware workshop was conducted at Price/Ahtna J.V. in Valdez, AK. Participants were involved in a short classroom segment to review ASME/ANSI standards as they relate to rigging gear inspection. The classroom portion was followed by a hands-on inspection of gear and a 4 hour workshop addressing proper use of slings and rigging hardware.

The Professional Rigger is a quarterly publication of Wire Rope & Rigging Consultants, Inc. It is distributed to those whose occupations require the safe and effective use of lifting and rigging equipment. For more information contact: Editor, The Professional Rigger, PO Box 728, Vancouver, WA 98666 (206) 256-5730.

WAPA

Western Area Power Administration's Casper Field Branch in Mills, WY was the location of a two day Electrical Utility Rigging Program. Lineman participated in a series of classroom workshops and hands-on activities. Dead-ending poles and towers and loads at center span were a few of the subjects addressed during the program.



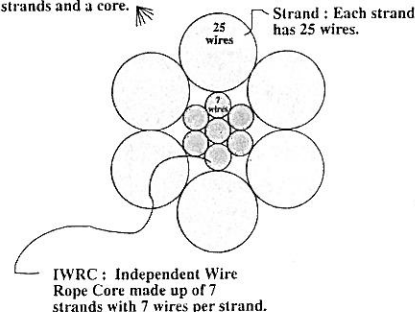
Bangor Hydro-Electric Co.

Mr. George Crouse requested WRRC to conduct two 2-day Wire Rope Inspection programs for 40 Bangor Hydro employees. The programs included a thorough examination of all OSHA & ANSI standards as they apply to the inspection of Wire Rope and associated hardware. Each participant completed hands-on inspections and were asked to identify all critical removal criteria for each piece of wire rope they inspected.

Subject wire rope:



Wire Rope : Has 6 outer strands and a core.



PacifiCorp

In early May WRRC conducted three, 2-day Industrial Rigging Training Courses for 45 employees at PP&L's Centralia Plant. Participants worked in teams while completing problem solving workshops during each two-day session. Some of the activities at the work stations included drifting loads using chain falls and dynamometers, eccentric loads, the use of air tuggers, incline planes, pre-operational inspection and use of mobile cranes.

Mazzella Wire Rope

Cleveland, OH was the site of a 3-day Certified Inspector Program. Mr. Tom Corall contracted WRRC to conduct the training for approximately 50 individuals.

The program was presented to develop and increase the participant's skills and knowledge in wire rope and rigging gear maintenance and inspection. The five sections covered during the program included wire rope, wire rope slings, synthetic web slings, alloy chain slings and below-the-hook lifting devices. Written exams on each section were given and a series of rigging gear inspections were performed.



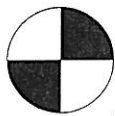
Basic American Foods

Mr. Jim Craghead asked WRRC to present an eight hour Rigging Fundamentals course for 20 participants at their facility in Moses Lake, WA. The program emphasized the use of chain falls and come-a-longs, load control practices, determining weight and center of gravity and proper use of their carrydeck crane.

WRRC NEWS (CONT)

Rigging Training Workshop 1995 - Portland, OR

With the huge success of Rigging Training Workshop 1994 behind us, we are excited about RTW '95, which will be held in **Portland, OR**. (Please see enclosed flyer.) Workshop attendees will participate in Rigging Level I, II and III followed by Master Rigger sessions. Problem solving training segments address rigging applications which will challenge those who are new to rigging and the seasoned veteran. A rigging accident case study and trainer's roundtable help round out the event.



WRRC's Mobile Learning Center is used during the Hands-On Workshop, which includes

mobile and gantry cranes, crane and rigging simulators, drifting structure, rigging towers, jacking and rolling equipment, and state-of-the-art material handling devices.

A Rigging Rodeo will cap off RTW '95, with everyone participating. The events include team competition in moving loads (load control), rigging inspections, hand-signals, crane load charts, accident investigation, rigging plans and knot tying & splicing. **Call today to register, as seating is limited to the first 160 paid participants.**

WRRC's Certified Inspector Program

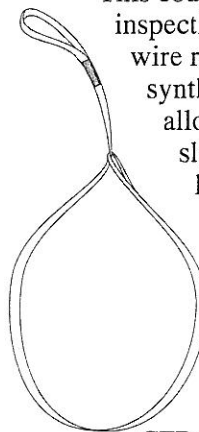
Don't miss out on our next Rigging Gear Inspector's Course. The remaining 1994 programs are scheduled for Sept. 12-15 and Dec. 5-8, both in Vancouver, WA. (Please see the enclosed CIP Flyer for more information.) Call WRRC today to register and reserve your place!

The course dates for next year in Vancouver are:

March 6-9, 1995
September 11-14, 1995
December 11-14, 1995

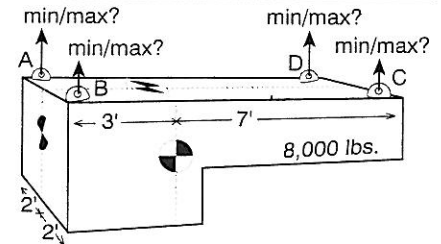
This course addresses inspection of wire rope, wire rope slings, synthetic web slings, alloy steel chain slings, below-the-hook lifting devices, and rigging gear/testing.

The instructional format is based on OSHA CFR 29 1910, ASME B 30 series, ASTM A-391, and ASTM E-4. Participants are required to pass written tests and hands-on field inspections to successfully complete any section.



Pick Points Workshop

[from pg. 1]



Min./Max. load at pick point D =
• $3 + 7 = 10$, $7/10 = .70$ [inverse = .30]
 $.30 \times 8,000 = 2,400$ lbs (D's sling may be shorter than C and lift the whole "north end" [30%], by itself.)
• The possibility also exists that the sling at C is shorter than D's sling, hence D may see 0 lbs of load.
D min. = 0 lbs., max. = 2,400 lbs.

Min./Max. load at pick point C =
• $3 + 7 = 10$, $7/10 = .70$ [inverse = .30]
 $.30 \times 8,000 = 2,400$ lbs (C's sling may be shorter than D and lift the whole "north end" [30%], by itself.)
• The possibility also exists that the sling at D is shorter than C's sling, hence C may see 0 lbs of load.
C min. = 0 lbs., max. = 2,400 lbs.

Min./Max. load at pick point B =
• $2 + 2 = 4$, $2/4 = .50$ [inverse = .50]
 $.50 \times 8,000 = 4,000$ lbs (If C's sling is slack, B lifts entire "east" portion.)
• The possibility exists that C will have 30% or 2,400 lbs., and A will have 50% or 4,000 lbs., so the remaining 1,600 lbs. of load is at B.
B min. = 1,600 lbs., max. = 4,000 lbs.

Min./Max. load at pick point A =
• $2 + 2 = 4$, $2/4 = .50$ [inverse = .50]
 $.50 \times 8,000 = 4,000$ lbs (If D's sling is slack, A lifts entire "west" portion.)
• The possibility exists that D will have 30% or 2,400 lbs., and B will have 50% or 4,000 lbs., so the remaining 1,600 lbs. of load is at A.
A min. = 1,600 lbs., max. = 4,000 lbs.

A = 20-50%, 1,600 - 4,000 lbs.
B = 20-50%, 1,600 - 4,000 lbs.
C = 0-30%, 0 - 2,400 lbs.
D = 0-30%, 0 - 2,400 lbs.

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Rigging Training Workshop 1995



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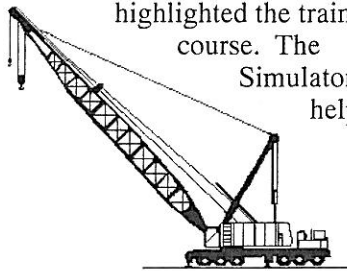
Training Services

- Mobile Cranes
- Overhead Cranes
- Bulldozers
- Backhoes
- Front-end Loaders
- Fork Lifts
- Man-Baskets (SPP)
- Scrapers
- Trenchers
- Bucket Trucks
- CDL
- Load Securement
- Aerial Work Platforms
- Snow Cats

Peak Oilfield Service

CET conducted a 4-day mobile crane course for operators at Peak's North Slope location in Prudhoe Bay, AK. Daily inspections, load chart interpretation and a session using

CET's Crane Simulator highlighted the training course. The Simulator helps



operators visualize a crane's reaction to dynamic conditions, operating practices and errors which may result in instability or structural damage.

Triton Coal

Triton's Mr. Richard Burns contracted CET to conduct a 3-day bridge crane and rigging course at their Gillette, WY site.

Port of Oakland

A heavy equipment training program was conducted for five Port employees who are getting ready to take the qualifying exercises for openings in the HEO



ranks. Some of the items addressed during the Oakland, CA program were safe operating practices, preoperational inspections and efficient machine use.



CRANE & LIFT INSPECTIONS, INC. • PO Box 728, Vancouver, WA 98666 • Bus (206)256-2862

Inspection Services

- Overhead Cranes
- Gantry Cranes
- Forklifts
- Mobile Cranes
- Aerial Work Platforms
- Bucket Trucks
- Man-Baskets (SPP)
- Container Cranes
- Monorail Cranes
- Manual, Air & Elec. Hoists
- Jib Cranes
- Winching Systems

CLI & CA-OSHA

Crane & Lift Inspections, Inc. became an approved Agent and Surveyor according to California OSHA standards. CLI's Mr. Eric Paivio completed all of the necessary mobile, overhead and tower crane exams to become the accredited Surveyor for CLI.

On the "Slope"

CLI's affiliate company in Anchorage, AK, Alaska Crane & Lift Inspections, Inc. (ACLI) recently completed the inspection of 400+ hoists and cranes in the Prudhoe Bay area for ARCO. ACLI has a very busy schedule throughout '94 and '95 performing inspections for a variety of clients in Alaska.

Oregon / Washington

CLI's Bob Foster and Dave Pelkey performed a series of tests/inspections for these clients over the last 4 months.

- James River
- Longview Fibre
- City of South Bend
- Harbor Bell
- Port of Willapa
- Yale Materials
- Trojan Nuclear
- Fisherman's Seafoods
- Cavenham Forest
- Sundial Marine
- Port of Vancouver
- Bay Center
- Nisbet Oyster
- Coast Seafoods
- South Bend Packers
- Port of Klickitat