# The Professional Rigger®

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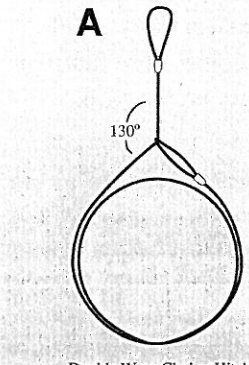
## TECHNICAL NEWS

### HITCHES & CAPACITIES

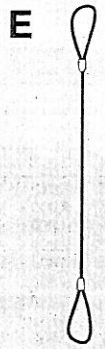
Deciding how to rig a load is an important step to achieving load control. An important factor to also consider is that the sling's capacity can vary greatly depending on the hitch configuration.

Pictured are 10 different sling hitches. Assume that the slings are 1" (wire rope) E/E mech. splice and the D/d ratio (load dia./sling dia.) is 30/1 for all illustrations. Identify the slings (A-J) in order of highest to lowest rated capacity and also give their approx. rated capacities.

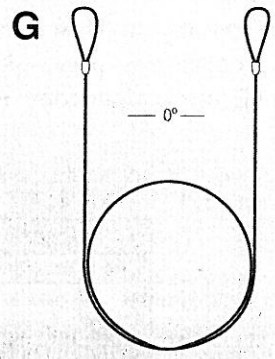
| High = 1 Low = 10 | Sling Letter | Approx. Rated Capacity (lbs.) |
|---|---|---|
| 1. | ____ | _____ |
| 2. | ____ | _____ |
| 3. | ____ | _____ |
| 4. | ____ | _____ |
| 5. | ____ | _____ |
| 6. | ____ | _____ |
| 7. | ____ | _____ |
| 8. | ____ | _____ |
| 9. | ____ | _____ |
| 10. | ____ | _____ |



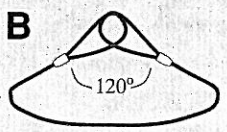
Double Wrap Choker Hitch



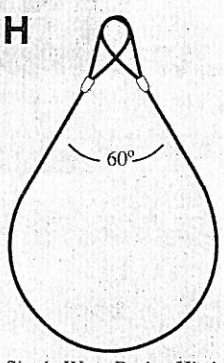
Single Vertical Leg



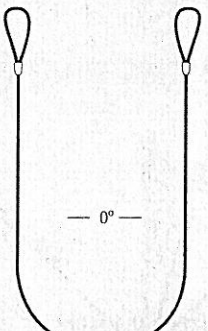
Double Wrap Basket Hitch



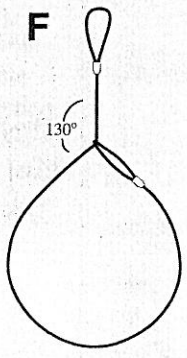
Single Wrap Basket Hitch



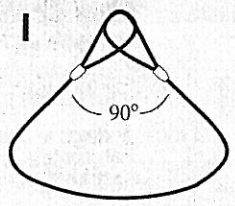
Single Wrap Basket Hitch



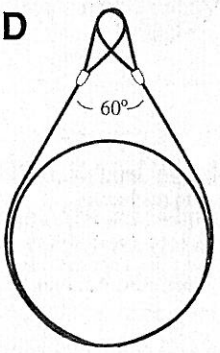
Single Wrap Basket Hitch



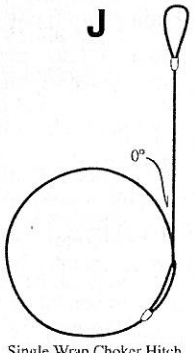
Single Wrap Choker Hitch



Single Wrap Basket Hitch



Double Wrap Basket Hitch



Single Wrap Choker Hitch (Turning Hitch in a Bight)

(For sling capacity info. refer to Section 1 of WRRC's Rigger's Reference Card and AISI chart on pg. 2)

# TECHNICAL NEWS

(cont.)

## HITCHES & CAPACITIES

The following two charts should be used to arrive at the solutions for the workshop on page 1. We invite our clients to photocopy pages 1 & 2 of this newsletter and incorporate this information into a mini-training session on sling hitches. [The solutions are on pg 3.] Clients may purchase the entire Rigger's Reference Card from WRRC (complete with a 20 question quiz & answer key) to help employees become more familiar with all the data on the card.

***Rigger's Reference Card - General version***

**Sling Capacities** MECHANICAL SPLICE IN POUNDS DESIGN FACTOR = 5:1 (1)

| | Size in inches | VERTICAL | CHOKER | 2 - LEGS OR BASKET | 60° | 90° | 120° | Color Code (Optional) | Size in inches | |
|---|---|---|---|---|---|---|---|---|---|---|
| IPS WRC Wire Rope | 1/4 | 1,100 | 840 | 2,200 | 1,940 | 1,580 | 1,100 | White | 1/4 | IPS WRC Wire Rope |
| | 5/16 | 1,700 | 1,300 | 3,400 | 3,000 | 2,400 | 1,700 | Lt.Green | 5/16 | |
| | 3/8 | 2,400 | 1,860 | 4,800 | 4,200 | 3,600 | 2,400 | Red | 3/8 | |
| | 7/16 | 3,400 | 2,500 | 6,800 | 5,800 | 4,800 | 3,400 | Yellow | 7/16 | |
| | 1/2 | 4,400 | 3,200 | 8,800 | 7,600 | 6,200 | 4,400 | Lt. Blue | 1/2 | |
| | 9/16 | 5,500 | 4,200 | 11,000 | 9,600 | 7,700 | 5,500 | Black | 9/16 | |
| | 5/8 | 6,800 | 5,000 | 13,600 | 11,800 | 9,600 | 6,800 | Orange | 5/8 | |
| | 3/4 | 9,700 | 7,200 | 19,400 | 16,800 | 13,600 | 9,700 | Tan | 3/4 | |
| | 7/8 | 13,000 | 9,800 | 26,000 | 22,000 | 18,300 | 13,000 | Dk.Green | 7/8 | |
| | 1 | 17,000 | 12,800 | 34,000 | 30,000 | 24,000 | 17,000 | Purple | 1 | |
| | 1-1/8 | 20,000 | 15,600 | 40,000 | 36,000 | 30,000 | 20,000 | Dk. Blue | 1-1/8 | |
| | 1-1/4 | 25,000 | 18,400 | 50,000 | 42,000 | 34,000 | 25,000 | Gold | 1-1/4 | |
| | | | MULTIPLIER → | | 1.00 | .75 | 60 | ← MULTIPLIER | | |

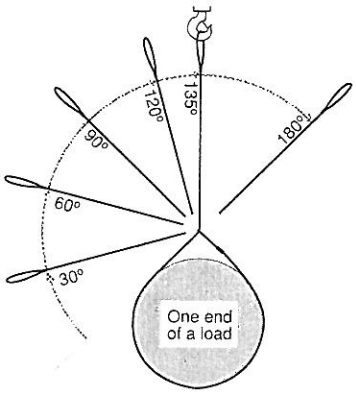
Formula to find sling length → Load width x Multiplier = Sling Length

### *Choker Hitch Rated Capacity Adjustment*

For slings in choke hitch when angle of choke is less than 135°.

| Angle of choke in degrees* | Rated Capapcity Percent* |
|---|---|
| 120-180 | 100 |
| 90-119 | 87 |
| 60- 89 | 74 |
| 30- 59 | 62 |
| 0- 29 | 49 |

* Percent of sling rated capacity in a choker hitch




When a choker hitch is drawn tight at an angle of less than 120 degrees, the Choker Hitch Rated Capacity shown in the sling Rated Capacity Tables must be reduced to allow for loss of Rated Capacity. In controlled tests, where the angle was less than 120 degrees, the sling body always failed at the point of choke when pulled to destruction. Allowance for this phenomenon must be made anytime a choker hitch is used to shift, turn or control a load, or when the pull is against the choke in a multi-leg lift.

Source: American Iron & Steel Institute, WIRE ROPE USER'S MANUAL, 2nd Edition

# CLIENT NEWS

## ALCOA

Ms. Char Padilla from ALCOA's Rockdale, TX site contracted WRRC to present two 2-day Comprehensive Rigging Courses. A total of 30 participants attended the program at the Sandow Mine. The course included hitch configurations, load weight estimation and the proper rigging and moving of a variety of loads during the hands-on course. ♦

## IDAHO POWER CO.

Mr. Leon Swensen, Line Training Instructor for Idaho Power asked WRRC to conduct Crane Operator Training for their bridge and mobile cranes. The five-day Mobile Crane Operator Training Course attended by 16 participants consisted of comprehensive classroom instruction, load chart workshops and hands-on operator evaluations. Nine operators participated in the Bridge Crane Operator course. Written exams and a hands-on evaluation of each operator were performed. ♦

## HOFFMAN CONST.

Hoffman Construction in Portland, OR was the location for a one-day Comprehensive Rigging Course in October. Mr. Wayne Thomas, Safety Director, coordinated the program which covered proper rigging techniques and load control methods. ♦

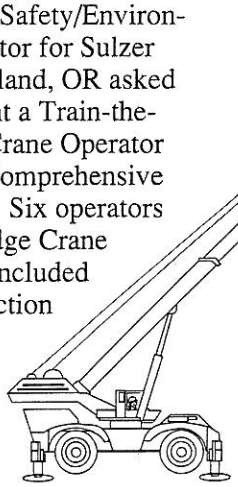
The Professional Rigger is a quarterly publication of Wire Rope & Rigging Consultants, Inc. It is distributed to those whose occupations require the safe and effective use of lifting and rigging equipment. For more information contact: Editor, The Professional Rigger, PO Box 728, Vancouver, WA 98666 (206) 693-6030

## GRANT COUNTY PUD

Mr. Marv Scott, Safety Supervisor for Grant County PUD in Ephrata, WA contracted WRRC to conduct Comprehensive Rigging training at their Ephrata, Moses Lake and Wanapum Dam locations. The classes were given over a 7-day period and were attended by hydro mechanics, linemen, warehouse and electrical shop employees. The programs included classroom activity followed by a series of field rigging exercises with the participants implementing the items covered in the classroom. ♦

## SULZER BINGHAM

Mr. Tom Davis, Safety/Environmental Coordinator for Sulzer Bingham in Portland, OR asked WRRC to present a Train-the-Trainer Bridge Crane Operator Program and a Comprehensive Rigging Course. Six operators attended the Bridge Crane Program which included classroom instruction with written exams, and a hands-on operator evaluation was completed lifting live loads according to an operator's checklist. The two-day rigging program consisted of eight hours classroom activity followed by an extensive series of field rigging exercises. ♦



## CITY OF PORTLAND

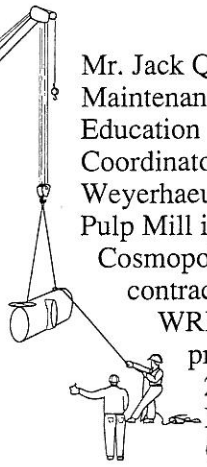
The City of Portland, Bureau of Water Works contracted WRRC to present two 2-day Comprehensive Rigging Courses for 40 employees. The classes which were coordinated by Mr. Clint VanArsdall, Safety and Health Manager, covered rigging gear inspection and safe and efficient rigging techniques. ♦

## TROJAN NUCLEAR

Mr. Kevin Davidson from Trojan Nuclear Plant in Rainier, OR asked WRRC to present a two-day Comprehensive Rigging Course for 20 employees. The course included rigging gear inspection, rigging and load control practices for vertical and horizontal rigging systems. ♦

## WEYERHAEUSER

Weyerhaeuser in North Bend, OR was the site for a Comprehensive Rigging Course held at the end of October. Mr. Thomas Scheideman, Maintenance Manager, contracted WRRC to present the four-day program. The course included extensive classroom activity of proper rigging techniques and load control methods followed by a series of field rigging exercises. ♦



Mr. Jack Quien, Maintenance Education Coordinator for Weyerhaeuser's Pulp Mill in Cosmopolis, WA contracted WRRC to present a 2-day Mobile Crane Training Course. A series of written tests were administered along with a load chart workshop on the Drott 30 Ton Rough Terrain and hands-on operator evaluations were performed. ♦

## JACOBS RANCH MINE

Mr. John Metzger, Maintenance Trainer for Jacobs Ranch Mine in Gillette, WY coordinated two 3-day Mobile Crane Operator Training Programs in October. 17 operators participated in the program which included extensive classroom instruction, load chart workshops and hands-on operator evaluations. ♦

## HITCH & CAPACITIES WORKSHOP SOLUTIONS

| High = 1 Low = 10 | Sling Letter | Approx. Rated Capacity (lbs.) |
|---|---|---|
| 1. | C | 34,000 |
| 2. | G | 34,000 |
| 3. | D | 30,000 |
| 4. | H | 30,000 |
| 5. | I | 24,000 |
| 6. | B | 17,000 |
| 7. | E | 17,000 |
| 8. | F | 12,800 |
| 9. | A | 12,800 |
| 10. | J | 6,272 |

Riggers should always remember that the type of hitch that's applied to a load can greatly affect the rated capacity of the sling. This 1" wire rope sling can offer the rigger 34,000 lbs. of lifting capacity or as little as 6,272 lbs.! How it is rigged makes the difference, and after the rigging system has been selected, it's up to the rigger to ensure that the sling has the necessary rated capacity to lift its assigned portion of the load.

# CLIENT NEWS

(cont.)

## WESTINGHOUSE HANFORD

In October Westinghouse Hanford's nuclear facility at Richland, WA was the location for a Comprehensive Rigging Program. The two-day program included eight hours of classroom activity followed by an extensive series of field rigging exercises with the participants implementing the items covered during the classroom instruction. ♦

## PACIFIC POWER & LIGHT

Mr. Jim Smith, Training Supervisor at PP&L's Centralia Steam Plant asked WRRC to present a one-day Advanced Rigging Program. The course included classroom instruction, load chart workshop and hands-on operator evaluations. ♦

## SACRAMENTO COUNTY

Mr. Graham McEntire, Training Officer for Sacramento County, Water Quality Division contracted WRRC to present a two-day Comprehensive Rigging Course for 20 employees. The classroom portion included extensive written testing followed by a hands-on operator evaluation. ♦

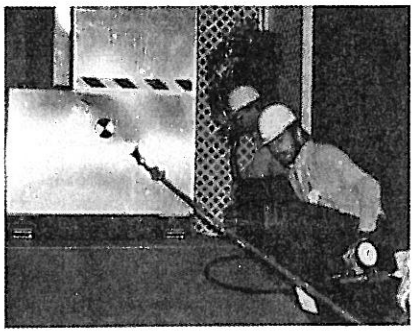
# WRRC NEWS

## RIGGING CONFERENCE 1991

### A Huge Success!!

"I have been to many seminars & conferences, but this one has topped them all. Keep up the outstanding work." R. Tejchman, Baltimore Gas & Electric.

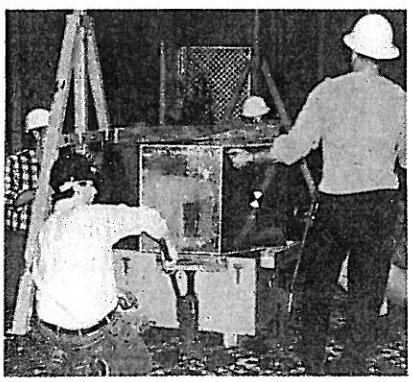
The responses received were unanimous. Rigging Conference 1991 **was** a huge success!! Hands-On Rigging including the Mobile Learning Center, Rigging Gear Inspection, Load Chart Interpretation, and Load Weight Estimation Workshops were listed as favorites by those in attendance.



RC '91 Hands-On Rigging / Mobile Learning Center

WRRC would like to thank the following companies who participated in RC '91:

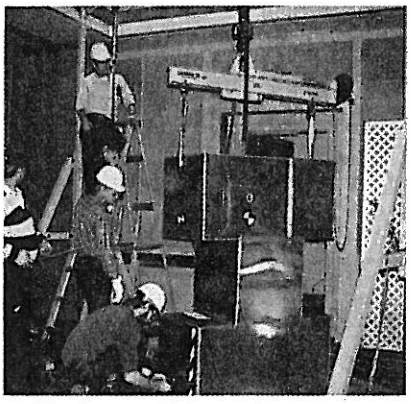
Amoco, Ayers Wire Rope Service, Baltimore Gas & Electric, Bonneville Power Admin., Cape Romain Contractors, Charleston Naval Shipyard, Charleston's Rigging & Marine Hdwr., Dept. of Energy, Duke Power, Hercules, Hanahan Water Treatment Plant, Kemira, Kiewit Western, Longbeach Naval Shipyard, Murphy Rigging and Erecting, Norfolk Naval Shipyard, N.Y. Power Authority, Rigging Products, Scherbon Consolidated, Southwest Paper Mfg., Trident Refit Facility, U.S. Coast Guard, U.S. Steel Mining Co, Union Pacific Railroad, Utah P&L, Waterman Wrecking, Westinghouse Elect.,Westinghouse Hanford, Westinghouse-Savannah River, and Weyerhaeuser Co.



RC '91 Hands-On Rigging / Mobile Learning Center

We also had representatives from several of the manufacturers who donated to the Mobile Learning Center with us for the Conference. Our special thanks to Aero Go, Columbus-McKinnon, Enerpac, Griphoist, Harrington, I & I Sling, Inter Product, Lift-All, Measurement Systems Int'l, Paratech, and The Caldwell Co.

Rigging Conference 1992 will be in the Los Angeles Area. WRRC is already planning to make it even better by including the rigging gear inspection and case study accident workshop as part of the Rigging Rodeo, along with the load moving contest. The manufacturers presentations will include actual demonstrations of their products showing do's and don'ts, applications and maintenance. ♦



RC '91 Hands-On Rigging / Mobile Learning Center

## CERTIFIED INSPECTOR PROGRAM 1991

WRRC cordially invites you to register for our sixth annual CIProgram which will take place March 12-14 in Vancouver, WA.

The course addresses wire rope, wire rope slings, synthetic web slings, alloy chain slings and rigging gear/testing. The instructional format is based on OSHA CFR 29 1910, ANSI B30 series, ASTM A-391, ASTM E-4 and RR-W-410D. Participants are required to pass written and hands-on field inspection tests to complete each course section.

Call WRRC today to register and reserve your seat.