



University-National Oceanographic Laboratory System

Research Vessel Operators Committee

Volume 19, Number 2

RVOC Newsletter

5 August 1994

The annual meeting is scheduled for 25, 26, and 27 October 1994 in Savannah, GA. It is being hosted by Skidaway Institute.

Lee Knight of Skidaway has asked that I pass along that plans (including activities for your spouse) are nearly complete. Packets with all the details will be sent to attendees on or about 1 September. Hotel reservations must be made by 1 October.

We look forward to seeing everyone there. A copy of this year's agenda is enclosed; please review it and give us your suggestions. We need your assistance for our annual meeting to be successful. This particularly applies to the workshops where we need work group leaders and recorders. If we do not hear from you volunteering, you can anticipate that the next phone call you get may be from us.

Best Regards,

Paul Ljunggren

#### RVOC Ship Updates

##### SCRIPPS-R/V ROGER REVELLE (AGOR 24) PROGRESS.

Construction continues at a rapid pace. The ship moved one step closer to launching in early August when she was shifted to Building Position B in the Halter yard to make room for start of construction of AGOR 25. The next step will be the move to the launch position after the launch of T-AGS 62.

Halter has announced that the ship will be launched during the last week of February 1995, fully two months before the contract date. This also raises the possibility of an early delivery.

Major decisions during this period included agreement on the flush mounting of the multi-beam system, selection of the traction winch supplier and identification of various electronic equipment suppliers. The ECP effort for AGOR 24 is now centered on the bridge wings. Due to the construction progress, other desired changes cannot be included because of the lead time required. Many of these changes are being worked on and will be in effect for the follow-on ships.

As construction accelerates, monitoring the shipbuilder's conformance to specification and design becomes the major effort. Thus far, quality has been good and there is a good

working relationship between SIO's Owner's Representative, Ed Petersen, the U.S. Navy support staff in the shipyard, and Halter Marine personnel.

### **Policies-Personal Protective Equipment**

At the last meeting I was asked to collect information on Hard Hat, Safety Shoe, and Life Vest policies as they exist in industry. The response that I received to these inquiries was less than enthusiastic and in fact minimal. It seems that many companies are unwilling to share this information and consider their entire safety program proprietary. My response came from a geophysical firm who I have some personal contact with. What would serve us better in developing this kind of information is obviously personal contact by members with local commercial operators. The information I have came from MSC and Digicon. If RVOC members can obtain examples of Personal Protective Equipment(PPE) policies from operators who you might have personal contact with and send it along to me I will try to compile it in a useful format. Thanks for your help. Paul Ljunggren

### **RVOC Directory**

Enclosed is the latest RVOC Directory. Please send me any corrections.

1994

RVOC AGENDA

0830 Tuesday, 25 October 1994

0800 REGISTRATION AND COFFEE

Bring spouses to meet one another and plan their activities.

0830 WELCOMING REMARKS

- Lee Knight, Skidaway Institute of Oceanography
- Director, Skidaway Institute of Oceanography
- Mike Prince, Chairman, RVOC

0900 OLD BUSINESS

- Minutes of the 1993 Meeting - Mike Prince
- RVOC Newsletter - Paul Ljunggren
- Legislative agenda, GPS P-Codes and Radio Officers-Joe Coburn, Dolly Dieter, Paul Ljunggren
- Medical Service contract

0930 NEW BUSINESS

- Oil spill response plans
- Shipyard reserve funds

1000 COMMITTEE AND LIASON REPORTS

- UNOLS, Jack Bash & UNOLS Chair
- Safety Committee, Tom Smith
- RVTECH, Steve Rabalais
- FIC, Joe Coburn

1100 AGENCY REPORTS

- National Science Foundation - Dolly Dieter
- Office of Naval Research - June Keller
- Oceanographer of the Navy - Patrick Dennis
- NOAA - Capt. Martin Mulhern
- USCG - LCDR Bob Garrett
- U.S. State Department - Tom Cocke
- Others

1200 LUNCH



0830 Tuesday, 25 October 1994  
(continued)

1300 SPECIAL REPORTS

- Skidaway Institute of Oceanography (Tour of Facilities???)
- Mexican Representatives
- NERC - Ken Robertson
- Institute of Ocean Sciences - Dale Gibb
- Bedford Inst. of Ocean. - James Wheelhouse
- OCEANUS Class Mid-Life/Admeasurement- Bill Hahn/Joe Coburn/Ken Palfrey
- REVELLE (AGOR 24) - Tom Althouse
- AGOR 25 & Knorr conversion - Joe Coburn
- Z-Drive gear problems - Tom Althouse, Robert Hinton, Joe Coburn
- Arctic Research Vessel - Jack Bash (Video)
- AAUS - Michael Lang, R/V Diving statistics
- Medical Health Services
- Any other operators with special reports

1500 REGULATORY UPDATE

- Report on recent and pending regulatory changes and their impact on Research Vessels (15-20) minute presentation followed by questions, answers and comments)

1600 INSURANCE AND LIABILITY

- Report by Dennis Nixon on liability and insurance issues. (15-20 minute presentation followed by questions, answers and comments)

EVENING DINNER FOR MEMBERS AND SPOUSES

0800 Wednesday, 26 October 1993

0800 ADMINISTRATIVE BUSINESS AND WRAPUP OF TUESDAY'S AGENDA

0830 WORKSHOPS ON R/V MANAGEMENT (Concurrent Workshops)

Workshop groups will be formed prior to the meeting and the final agenda for their discussions will be determined by the members of each group. The subjects below are only suggestions at this point. A workgroup leader and recorder will be needed for each group. Volunteers will be solicited.

Control of Pollution and Hazardous Materials Workshop:

- Oil Spill Response plan - generic version for vessels
- Changes to Safety Standards for Hazardous materials
- Other OPA 90 issues
- MARPOL issues

Operating Budget workshop.

- Go through proposal budget line by line w/discussion of methods for estimating and planning each budget item
- Identify problem budget areas and identify possible methods for savings or greater efficiency.
- Shipyard Reserve (Major Overhaul Stabilization Accounts - MOSA)
- Maintenance and Overhaul planning
- How to plan a mid-life or other major overhaul

Research Vessel Utilization and Future Planning workshop

- Consider the definition of operating days, maintenance days and at sea days and determine if improvements can be made in the methods for tracking vessel utilization
- Consider the UNOLS Fleet Improvement Plan, the Coastal Marine Science Workshop report and the Ocean Sciences Strategic Plan for Research and Education (OSSPRE) and identify the ramifications for Research Vessel Operators.
- Consider better methods of evaluating Research Vessel performance and condition such that UNOLS vessels can be compared with each other and against other research vessels.
- Consider the impact on the UNOLS fleet of the privatization issue. Discuss the benefits of University operated research vessels.

1200 LUNCH

1300 REPORTS FROM WORKSHOPS (Brief report with follow up during round table)  
(15 Mins each)

1400 SEMINAR ON SAFETY EQUIPMENT AND PROCEDURES

- Sandy Schwaab of Jamestown Marine Services which was one of the contractors that produced our Safety Training Manual will make a presentation on new shipboard safety and firefighting equipment
- Discussion on the standard use of equipment and safety procedures

0830 Thursday, 27 October 1993

0800 SAFETY COMMITTEE REPORT ON UPDATE TO SAFETY STANDARDS

0900 ROUND TABLE DISCUSSION

- Marine Superintendents will select and discuss topics of mutual interest.

Some items already suggested:

- OPA 90
- ADA
- Physicals and HIV positive employees
- Responsibility of Chief Scientist
- Crew Compensation
- Ship Layup and maintenance policy
- Pollution and Hazardous Materials matters
- MAS contract
- Automation/Alarm systems
- GMDSS equipment
- Reports by operators of equipment purchases or planned purchases

1200 LUNCH

1300 CONTINUE ROUNDTABLE

1400 BUSINESS MEETING

- Election of Chairman and Vice Chairman, come prepared with nominations
- Assignments to committees, panels and workgroups
- Review of action items pending
- Suggestions for the 1995 Agenda and meeting format, everybody should come to meeting with one idea, preferably in writing.  
(PLEASE REFER TO WORKSHEET ATTACHED)
- Confirm Scripps as host for 1995 meeting and vote on host for 1996 meeting. Come prepared to volunteer.

1500 ADJOURN

## NEXT YEAR'S RVOC MEETING

Please use this form before and during the meeting to record any suggestions you may have for next year's meeting.

Suggestions for agenda items, workshops or guest speakers

Suggestions for changes or improvements to the meeting format or schedule



RVOC Directory,

Clippings,

Etc.

RVOC Directory  
August 11, 1994

Name	Institution	Tel. No. / Fax No.	Telemail	Internet
Gene Allmendinger	UNH	603-868-2684	-	-
Tom Althouse	SIO, UCSD	619-543-1643 619-534-1635	SCRIPPS.MARFAC	talthouse@ucsd.edu
Tim Askew	Harbor Branch	407-465-2400 407-465-2446	HBOI.SHIPS	
Lee Black	Bermuda,BBS	809-297-1880 809-297-8143	BDA.BIOSTATION	
Joe Coburn	WHOI	508-548-1400 508-540-8675	WHOI.SHIPS	jcoburn@whoi.edu
Bruce Cornwall	U of Maryland	410-326-7243 410-326-6342	CHEASAPEAKE.BAY	
Bill Coste	U of Hawaii	808-848-2661 808-848-5451	UH.SNUG.HARBOR	snug@soest.hawaii.edu
Don Gibson	U of Texas	512-749-6735 512-749-6777	T.WHITLEDGE	
Linda Goad	U of Michigan	313-763-5393 313-747-2748	T.MOORE	linda.goad@umich.edu
Bill Hahn	URI	401-792-6203 401-792-6574	RHODE.ISLAND	
Robert Hinton	U of Washington	206-543-5062 206-543-6073	R.HINTON	Hinton@ocean. washington.edu
Ron Hutchinson	U of Miami	305-361-4880 305-361-0546	R.HUTCHINSON	rhutchinson@rsmas. miami.edu
Lee Knight	Skidaway	912-598-2486 912-598-2310	L.Knight	
Dean Letzring	Texas A & M	409-740-4469 409-740-4456	RV.GYRE	
Quentin Lewis	Duke	919-728-2111 919-728-2158	DUKE.UNC	
Paul Ljunggren	LDEO	914-365-8845 914-359-6817	LAMONT.SHIP	marsupt@ldeo .columbia.edu
Eugene Olson	FIO	813-893-9100 813-893-9109	J.OGDEN	
Waddy Owens	U of Delaware	302-645-4320 310-645-4006	W.OWEN	

Ken Palfrey	OSU	503-867-0224 503-867-0294	OSU.SHIPS	
Mike Prince	Moss Landing	408-633-3534 408-633-4580	MLML.SHIPS	Prince@MLML .CALSTATE.EDU
Steve Rabalais	LUMCON	504-851-2808 504-851-2874	LUMCON	
Tom Smith	U of Alaska	907-224-5261 907-224-3392	T.SMITH.UAF	
Entire RVOC			RVOC.OPERATORS	



# Ship management in a quality code quandary

In ship management circles, today's buzz word is "quality." But *which* QA codes make the most sense?

**N**EVER mind the width, feel the quality. After years of rapid growth, ship management companies are now worshipping at the altar of quality with all the fervor of recent religious converts. Highly sensitive to critics who have branded them as little more than surrogate cost and corner cutters, ship managers both individually and collectively are embracing the twin doctrines of integrity and excellence.

"The buzz word is certainly 'quality,'" says Captain Frank Preece, fleet director for Isle of Man based Dorchester Maritime. "On the technical side, owners expect you to give them high quality expertise. On the manning side, they expect crews to be highly trained and fully qualified. And overall they're looking for a quality, integrated service."

Dorchester, which manages about 50 ships on behalf of around 10 clients, is one of a growing number of ship managers currently seeking to comply with ISO 9002 quality assurance standards. But Preece readily admits that compliance with ISO 9002 is very costly in both management time and expense.

"You get sucked into costs because all of the auditors insist on going through a fixed routine," says Preece. "And it's not just to qualify; the expense continues." But despite the cost—which he says "must already

run into tens of thousands of pounds"—Preece is utterly convinced of its importance to Dorchester's future. "We are simply going to have to be qualified — our future business will depend upon it."

Although Preece denies that Dorchester is under any pressure from its clients to satisfy a recognized

says Preece. "Our target (for compliance) is March 1994," he adds.

Dorchester has yet to apply for membership of ISMA—the International Ship Managers' Association—though general manager G. J. Perry says that, as a Schulte Group member, "we obviously support ISMA's aims." Membership of ISMA is a future possibility for Dorchester, in which case ISO 9002 accreditation would obviously be a useful step towards meeting the somewhat broader ISMA QA code.

## ISMA AND ISM

Despite its increasing popularity, ISO 9002 is not universally embraced by prominent ship managers seeking official recognition of their quality service. Douglas Laing, responsible for quality assurance and business development with ISMA member Denholm, describes ISO 9002 in isolation as being "completely meaningless to the shipping industry."

Speaking in a purely private capacity, Laing personally feels that ISMA's code of ship management standards is the most appropriate quality assurance benchmark for ship operations. He argues that the relevant aspects of ISO 9002 are incorporated into the voluntary ISMA code. He also believes that because Denholm is accredited under the ISMA ship management code it should automatically be in compliance with the International Maritime Organization's International Safety

Management (ISM) code.

The ISM code is designed to provide an international standard for the safe management and operation of ships and for pollution prevention. It was formally adopted in London last month (November) by IMO's 18th Assembly. In May this year, IMO's influential Maritime Safety Committee is expected use it as the basis for a new chapter in the International Convention for the Safety of Life at Sea (SOLAS) 1974.

### WHAT DIFFERENT QUALITY CODES COVER

	ISMA	ISO 9002	IMO	ISM	DenV
Business Ethics	✓				
Organization	✓				
Personnel	✓				
Safety	✓				
Environmental protection	✓				
Contingency planning	✓				
Operational capability	✓				
Cost efficiency/purchasing/contracting	✓				
Maintenance/maint. standard	✓				
Technical support	✓				
Insurance	✓				
Accounting	✓				
Cert. & compliance, rules/regs	✓				
Cargo handling & cargo care	✓				
Communication procedures	✓				
Management agreement	✓				
Records	✓				
Auditing body	✓				
Quality system	✓				
Document control	✓				
Internal quality audits	✓				

international quality assurance standard, he does concede that "if clients are going through it themselves, it has to involve ourselves."

"But yes, we will get a benefit. No doubt it will make us more efficient. Whether that is cost effective is another matter. But one has to say that, yes, it's worth while."

Dorchester, which is a member of the international Schulte Group, is being audited by the international classification society Lloyd's Register,



# Cyprus: Ship management's center stage

**W**ITH more ship management companies based there than anywhere else, Cyprus can claim to be the center of the ship management world. And while the International Ship Managers' Association (ISMA) may be headquartered in London, it is registered as a company in Cyprus, which is certainly an ISMA stronghold. Cyprus is thus likely to play a prominent part in efforts being made by ISMA to gain official recognition that companies that are ISMA code accredited are automatically in compliance with IMO's ISM code. ISMA is understood to be hopeful of gaining IMO's support for this. But ultimately the decision will rest with individual flag administrations. Among flag administrations likely to be lobbied early by ISMA is the Cyprus Department of Merchant Shipping. With Cyprus now controlling the world's third largest open registry fleet, its recognition of the ISMA code would provide a valuable precedent for other registers.

Meanwhile, the island's ship managers continue to add to their fleets.

With some 200 ships under management, Columbia Shipmanagement, the largest of them, reports that it has attracted additional tonnage from eastern Europe in the last couple of months and is negotiating a newbuilding in Poland for its parent Schoeller Holdings.

Managing director Captain Dirk Fry says that Columbia's experience as a certified member of ISMA has been "quite positive" and "a very good sales point" in gaining new clients.

Though Fry has not seen any recent changes in the type of shipowner turning to third party ship management, he sees that an added incentive for smaller owners to enlist the assistance of professional ship managers could be the difficulties such owners may face in complying with ever increasing regulatory burdens. Among these, of course, will be IMO's ISM


code. This, points out Fry, "is based on IMO Resolution 680 which is also covered by the ISMA code, so there should be very little, if any, changes necessary for ISMA members to comply with the ISM code."

The Schulte Group's Hanseatic Shipping is another prominent Cyprus ship manager that has been adding to its managed fleet. The majority of the 20 ships added last year, according to managing partner Captain Joachim Meyer, were newbuildings—including double hull, double bottom crude carriers

and human resources management.

Hanseatic is soon to start construction of its new Marine Training Center in Cyprus and, in addition to its present Hanseatic Marine Training School, also operates the LPG/LNG training ship Annabella. These facilities, says Meyer, "have substantially contributed to the current and future continued availability of well-trained professional staff for the very highly sophisticated fleet under management."

One individual who has played a major role in helping to make Cyprus both a major ship management center and a leading open register flag is former presidential maritime advisor Zenon Katsourides. Lately, he has been following the advice that he earlier gave others and has established his own Cyprus-based ship management company, Sea-Praxis—the first ship management company to be run from Cyprus by Cypriots. The company now owns four ships outright. All are geared bulk carriers—each with four 25t cranes—special strengthened for carrying ore. Average age of the fleet is 1.5 years. Additionally, the company



**STRATEGIC LOCATION and positive attitude to shipping have helped Cyprus attract more ship managers than any other center**

manages two Greek-owned bulkers and two tankers. A further two ships are expected to come under Sea-Praxis management shortly and the company is acquiring a 27,000 dwt bulker built in 1982/3. This will bring the fleet total to 11. Besides Katsourides himself, the Sea-Praxis staff includes managing director/operations manager N. Mavreas, an assistant operation manager, two marine superintendents, a port captain, a spare parts/store clerk, an accountant and two secretaries. All are Cypriots or married to Cypriots and most have worked for Katsourides in the past.

With its present office strength Sea-Praxis believes it can easily increase its activities to cover 100 owned/managed ships—and an office extension is already being built.

Meyer attributes Hanseatic's successful past year to two things: a strict quality assurance regime and a "continued and even further increasing commitment towards training and

assured of widespread recognition, if not meticulous adoption.

IMO is urging member governments to implement the code on a national basis as soon as possible, and is suggesting that priority be given to passenger ships, tankers, gas carriers, bulk carriers and mobile offshore units. It is not likely to enter into force until 1988, though some administrations may require earlier compliance.

The IMO code establishes safe management objectives and requires a safety management system to be established by the shipowner or operator. It is described by IMO as laying down "standards for ship management which are much more detailed than anything that exists so far."

IMO's initiative was warmly welcomed by Peter Cooney, managing director of ship manager Acoma

"This will have the effect of making the safety management code mandatory in the countries which have so far ratified the SOLAS convention," confirms IMO information officer Roger Kohn.

More than 120 countries, whose merchant fleets make up more than 96% of world tonnage, have ratified SOLAS. Thus, in theory at least, the new safety management code seems



## GE Capital buys into V. Ships

**T**HE world's biggest financial services company, GE Capital Corporation, now has a presence in the third party ship management business. It has taken a 20% stake in V. Ships. Based in Monaco, and with associated companies in New York, N.Y., Cyprus, the U.K., India and Italy, V. Ships is a first rank ship manager with around 150 ships under its management umbrella.

According to GE Capital, the investment in V. Ships will enable it to "pursue more extensive shipping projects." An official joint statement noted: "With the increased focus on the environment and quality assurance, GE Capital

believes its investment in V. Ships will enable it better to address these issues on a worldwide basis, in conjunction with its other partners in the industry."

A number of observers see the move as a sign that GE Capital could be positioning itself to help meet a much forecast shortage of capital in shipping. If that is the case, a link with a top level ship management company could make a lot of sense. In any event, GE's involvement with V. Ships must be seen as giving added credibility to the ship management industry as a whole—or at least to the companies at the top end of the spectrum.

U.K. "I am very enthusiastic about it," he says. "It's one of the more important initiatives we have seen from IMO. It means quality standards are here to stay and there's no use whining about it."

Cooney accepts it will take some time before the IMO code has any major impact on sub-standard ship managers. However, he is convinced that with rig-

orous verification and enforcement by port and flag state controls, the code will have a positive impact.

Acomarit, which provides full management services for a fleet of about 185 ships and crewing for a further 25, was one of the first ship management companies to receive a quality assurance accreditation.

"We've been accredited under the

Det norske Veritas SAP system for two years," says Cooney proudly. He maintains that DnV's quality management for safe ship operation and pollution prevention meets all relevant ISO 9002 standards and is very close to IMO's international safety management code.

"The DnV SAP system only differs from the IMO concept cosmetically," adds Cooney.

For this reason he expects Acomarit U.K. will have little if any difficulty meeting all aspects of the IMC code. Should a formal verification process be necessary, however, he says Acomarit would welcome it.

"Don't forget, in this office we are audited five or six times a year—by oil majors, shipowners, and classification societies. And every time someone comes in, we always learn something from their visit."

Acomarit is probably the largest ship manager outside the ISMA umbrella. Cooney says Acomarit has no immediate plans to join ISMA but adds diplomatically that it's "always under consideration."

However, the imminent adoption by IMO of a mandatory safety management code, binding on ISMA

members and non-members alike, seems almost certain to diminish the chances of an application form being completed by Acomarit.

"If the IMO code becomes mandatory," asks Cooney, "why have ISMA?"

"The main reason for ISMA's existence," he continues, "was its laudable aim to establish minimum voluntary standards. But once you have international legislation doing the same thing, do you really need ISMA?"

### COMPARING CODES

ISMA's current president, Captain Joachim Meyer, managing partner of Hanseatic Shipping Company, Cyprus, says that ship managers who believe that the ISM code is comparable to the ISMA code "have not studied both."

A comparison between the ISMA code and other major codes available to the industry today, he says, "clearly marks that the ISMA code extensively exceeds any other."

"The ISMA Code," says Meyer, "is for those who want to demonstrate that all facets of their business will be subjected to internal revision and control as well as to external audit. It is an exercise to demonstrate to admin-

istrations, underwriters, bankers, clients and any other interested third party, the determination of ISMA member companies with respect to improved standards in the day to day affairs of running a ship."

Meyer believes that managers who are satisfied with the ISM code will merely be settling for "something that is demanded from them anyway, in a mandatory fashion." By contrast, "those who have opted for the demanding ISMA option have opted for the most advanced and the most comprehensive systems and control vehicle in the industry."

Andrew Linington, a spokesman for NUMAST, the British trade union that represent merchant marine officers, applauds ISMA's attempts at improving ship management standards but still has some doubts.

"We welcome what they've done but we've always had reservations about something that's policed only by its members," he says.

Meyer says this perception about self-policing is "simply incorrect." Each ISMA member is responsible, internally, for ensuring continued compliance with the code through an internal audit process. But, explains

Meyer, "ISMA has also established from the outset, an audit body consisting of three classification societies: Lloyd's Register, Germanischer Lloyd and Det norske Veritas, who jointly conduct external audits on board an ashore." Only if the audit body and its audit committee finds that the code being complied with will the ISM member be issued a certificate. The audit body will this year be enlarged to a maximum of six societies (ISM has been in negotiation with Bureau Veritas, the American Bureau of Shipping and Japan's NK). According to Meyer, "this will enlarge the external audit base and minimize the risk of external audits being biased."

Meyer says the classification societies are the "only available bodies who have the expertise, experience and knowledge in house to execute audits of all facets of a ship manager's day to day work."

"I personally do not know a method that ensures more external policing than the chosen system," he declares.

There is little doubt that ISMA has at the very least provided a much needed focus for the loftier aspirations of individual ship management companies. It has also filled a vacuum



by providing a collective voice and strategic direction for ship managers at a time when the industry was under concerted attack for alleged shoddy standards.

Some of the better aimed brickbats hurled at the industry articulated concerns at the quality of crews employed by some ship managers. Although there are still ship managers who pay too little attention to crew training and qualifications, most reputable managers have long recognized the fundamental importance of seafarer quality.

"I think the quality of crew is the single most important issue," says Acomarit's Cooney, "You can't have any kind of quality assurance without quality crews."

"Of course, it's a competitive and extremely cut-throat industry. Fee income is not nearly enough to fully justify the cost of meeting the highest standards. But I'm certain that initiative like the IMO code will help weed out the sub-standard operators."

Acomarit, which has strong links with the former Soviet Union and still manages ships for Sovcomflot, has just under 5,000 seafarers employed its total fleet of 210 vessels. About half are

from the former Soviet Union.

The break-up of the Soviet Union and the communist bloc has bought valuable time for a ship management industry faced with an increasing shortage of qualified seafarers. Nonetheless, although Russian and other ex-Communist bloc sailors are generally well-schooled in basic seafaring skills, both careful recruitment and supplementary training is often required to match men or women with specific jobs and ships. Extra training for engineers required to operate

**"Quality of crew  
is the single most  
important issue..."**

medium-speed diesels and special instruction for deck officers on tankers and gas carriers are fairly common requirements, says Dorchester's Preece.

Many of the larger and some of the smaller ship management companies have established their own in-house training facilities or have special arrangements with maritime colleges.

Dorchester, which is one of the largest employers of Polish seafarers, runs its own training program in Poland with two full-time English teachers, says Preece.

"We have a tailored training program for all our clients," adds Preece. He estimates that Dorchester's total training budget is "well in excess of \$3 million a year. And it's up to us to spend it in the most effective and efficient way."

Depressed freight rates, soaring insurance premiums, increasingly tougher safety rules and intense competition for cargoes and charters means ever greater pressure on owners to get the best possible service from their ship manager.

#### MAKING QUALITY WORK

Although an increasing number of ship managers are recognizing the quality route to success, it is misleading to ignore the fact that there remain a minority who view cost and corner cutting as the road to survival.

"The whole quality issue is balanced on knife-edge," says Laing. "A lot of people are knocking it, saying it won't work—We've got to make it work." **ML**

# CHANGE.

World energy requirements have increased dramatically and oil has played a major role in meeting those needs. The 7th edition of the *Tanker Handbook for Deck Officers* focuses on the changes experienced in the development of better oil transportation, as well as LNG (liquid natural gas) and chemical ships. With a host of new regulations covering the pollution of the sea by oil, building of new ships and the modification of older vessels it is necessary for all concerned to keep abreast of all the regulations; national and international. These regulations are mentioned throughout the text with a section devoted to regulations of oil pollution.

In addition to numerous photographs there are many fold-out diagrams provided throughout this large volume. Detailed charts and illustrations of: tanker arrangements, individual decks, ballast arrangements, cargo pumping & piping, and many other charts / illustrations are included to correspond with the text.

An entire chapter speaks to training and safety regarding tanker emergencies and has been updated to keep you current. In addition to expanding the subject matter to meet modern requirements Captain Baptist has also attempted to retain material covering older ships to provide the reader with the broadest viewpoint and an improved understanding of the oil tanker and its operation. Hardcover.....\$95.00

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# Reducing the accident and injury toll at sea

## Massachusetts Maritime Academy opens a dialogue on how industry and educators can help cut injuries and fatalities

**E**VERY year, the United States Coast Guard conducts 30,000 investigations of accidents and pollution incidents. Increased awareness of potential danger was the focus of a two-day Marine Occupational Health and Safety Conference held at the Massachusetts Maritime Academy, Buzzards Bay, Mass., last November. This conference, a first for the academy, opened a dialogue between industry professionals on prevention of accidents and fatalities through training—both on the job site and at an academy level.

The conference was cosponsored by the academy and Arco Marine, whose president, Captain Jerry Aspland, believes that a three-credit course on occupational health and safety (OHS) should be required for cadets. To begin implementation of such a program, Arco Marine presented the academy with a \$12,000 grant for the development of a new curriculum covering OHS.

In a conference presentation on "What is Marine Occupational Health and Safety?" Aspland and Heidi Goebel, manager of safety,

health and environmental protection at Arco Marine, gave examples of how the company has implemented its own preventative STEP (Safety Through Employee Participation) process. STEP focuses on OHS as the workers' individual responsibility.

Arco Marine employees attend safety meetings on issues such as industrial hygiene, waste management, and environmental regulation compliance. The STEP process includes behavior reviews and a system of posted daily reminders and stresses the role of department heads. Since the inception of the process in 1992, Arco Marine has experienced a 50% decrease in lost-time injuries, said Goebel.

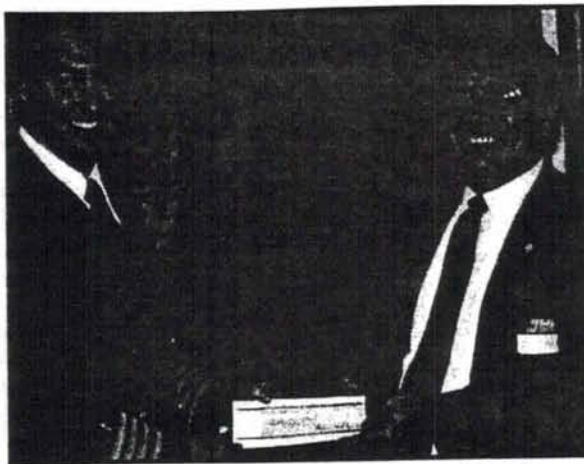
### CUTTING EDGE

Captain Thomas Bushy, dean of continuing education at the Academy and director of the conference, cited Arco Marine as being on the cutting edge of occupational safety and health. "They are doing what we all have to do," he noted.

In a "USCG Injury Report" seminar, Commander Steve Sheek, USCG, supported Arco Marine's thesis that the human factor is directly

related to on-the-job accidents. According to Sheek, operator error due to lack of knowledge or proficiency is the cause in 60-80% of the accidents and casualties investigated by the Coast Guard. To determine whether a mariner was aware of and properly assessed a potentially dangerous situation, the Coast Guard uses what it terms the Marine Investigation Module. It starts from the premise that one casualty can be the result of several events, such as operator fatigue, which could have been prevented. The module allows the Coast Guard to analyze personnel management, knowledge and proficiency, mental influence, rules, regulations, policies, and communication during an incident. Once inputted, this information can be helpful to companies and educators in determining areas of OHS areas where workers need further training.

In a presentation on "United States Coast Guard and Marine Occupational Health," Lieutenant Steven Danielczyk, USCG Hazardous Materials Branch, focused on existing and pending regulations in the industry—



**Arco Marine's Captain Jerry Aspland (right) presents Captain Thomas Bushy with a \$12,000 grant for development of an OHS curriculum at Massachusetts Maritime Academy.**

including new regulations on confined space entry. A draft is nearing completion which concentrates on pre-entry testing and recommends that entrants be trained in oxygen, toxins, flammables, corrosives and advised of their potential hazards. In addition, Subpart B to OSHA Maritime Standard 29CFR1915, expected in 1994, will deal with confined spaces and explosive

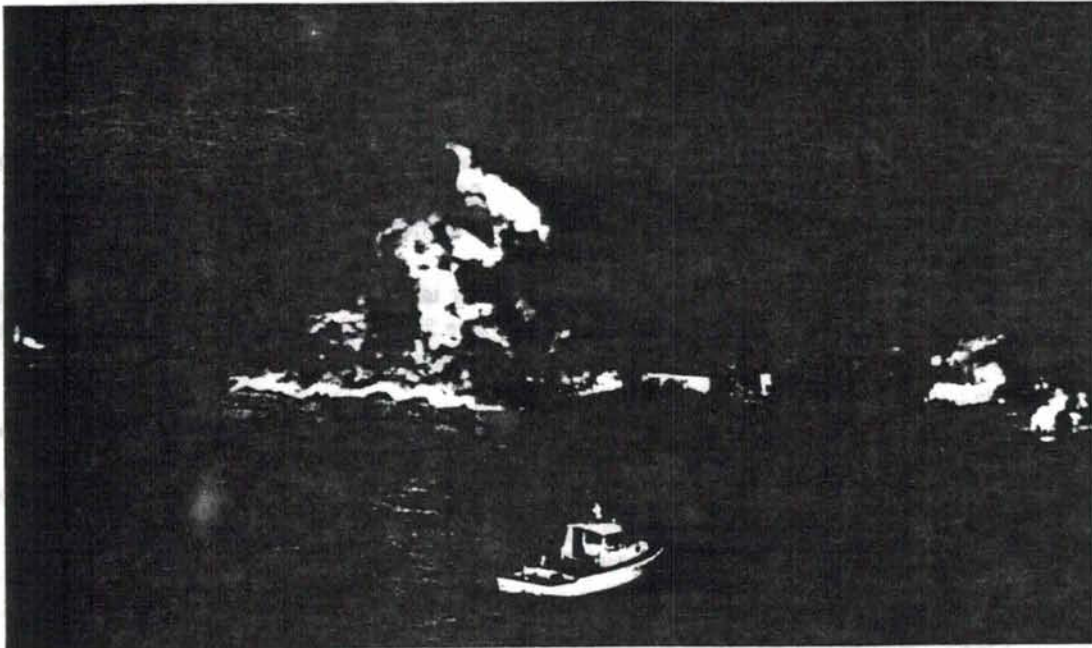
atmospheres. Subpart P, also due this year, will cover specific requirements for fire watches. Danielczyk advised conference attendees to make a health risk assessment of confined spaces and determine a need for safe work practices.

Future IMO regulations will deal with noise levels on ships, he also pointed out. To protect crew from noise that cannot be engineered out, operators of vessels 1,600 gt or more, both in port and at sea, will be required to limit noise in all spaces to a target of 80 decibels in a 24 hour period. Spaces must undergo initial surveying with testing repeated if conditions change.

Other sessions included: "Confined Space Entry," by Guy Colonna, chief chemical and marine engineer at the National Fire Protection Assoc.; "Marine Benzene Exposure Issues," conducted by Edward Willwerth, a certified marine chemist and industrial hygienist with Atlantic Environmental & Marine Services; and "OSHA and the USCG," led by Captain Bradley Wellock, an assistant professor at the Academy. **ML**



# The polluter pays



By *ENS Gregory Rainey*

Title I of OPA 90 is based on the "polluter pays" principle. It assigns specific financial responsibility to vessel owners and operators for damages from and clean up of oil spilled from their vessels, and seeks to ensure prompt payment.

If no responsible party can be identified or if he or she has spent to his or her limit of liability, an oil spill liability trust fund pays for the uncompensated removal costs and damages. This billion-dollar fund is administered by the National Pollution Funds Center, a Coast Guard headquarters unit in Arlington, Virginia.

Should the polluter be identified later on, all expenses from the trust fund would be billed to this responsible party. If a polluter denies designation as the responsible party, the fund will temporarily pay for removal and damages while legal action against the polluter is pursued.

[OPA 90 is enforced by the Coast Guard in the coastal zones and by the Environmental Protection Agency (EPA) in the inland zones.]

## Damage categories

Costs associated with pollution incidents are either for damages or removal. There are six categories of damage described in OPA 90:

- 1- natural resources (the destruction or loss of the use of natural resources and the costs of assessing damage);
- 2- damage to or destruction of personal or real property;
- 3- loss of subsistence use of natural resources;
- 4- net loss of government revenues (taxes, royalties, rents, fees or profit);
- 5- loss of profits or impairment of earning capacity resulting from injury to property or natural resources; and
- 6- costs of providing increased levels of public services in response to the incident.

---

When it comes to oil pollution,  
*"tis better to be over insured  
than not insured at all."*

---

### Liability

OPA 90 holds a responsible party liable for all federal costs, including that of monitoring the potential threat of a spill. Government costs to assess whether further action is required will usually not be charged to a responsible party. However, in cases where the federal on-scene coordinator finds that an oil pollution incident or a substantial threat of one has occurred, all federal costs, including those for monitoring, will be charged to the responsible party. (OPA 90 treats a substantial threat of a spill in the same manner as it treats an actual spill.)

The maximum amounts of liability in OPA 90 are based on vessel type and tonnage. (OPA 90 increases a responsible party's limits of liability over those in older legislation, and broadens the scope of damages that party should be required to pay.)

### Liability limits

- for tank vessels 3,000 gross tons or less are \$1,200 per gross ton, or \$2,000,000 total, whichever is greater;
- for tank vessels greater than 3,000 gross tons are \$1,200 per gross ton, or \$10,000,000 total, whichever is greater; and
- for all other vessels, \$600 per gross ton, or \$500,000 total, whichever is greater.

*Continued on page 38*

*A high price to pay -- Nine lives were lost and 30,000 barrels of oil spilled when the tank vessel Sansinena exploded in Los Angeles Harbor in 1976.*





*Continued from page 37*

These liability limits are not absolute. Under some circumstances, OPA 90 may subject a responsible party to unlimited liability. The circumstances include: negligence; vessel-related federal safety or operation regulation violations, which are the proximate cause of a casualty; failure to report an incident or refusal to cooperate with government officials. Under such circumstances, a responsible party may be liable for all removal expenses and damages.

### **Financial responsibility**

The government ensures that responsible parties can meet their liability limits by issuing certificates of financial responsibility. The Coast Guard issues the certificates to owners or operators of vessels who submit evidence that they can meet their maximum levels of liability for potential clean-up costs and damages. All vessels over 300 gross tons operating in United States waters are required to have these certificates on the vessels for which they are issued, and are subject to Coast Guard and customs inspection.

Owners and operators of vessels up to 300 gross tons do not have to have certificates of financial responsibility, but they are still subject to OPA 90 liability provisions. If a small uninsured vessel 300 gross tons or less is designated as a source of oil pollution, the owner or operator would still be liable for removal costs and damages associated with the spill, up to his or her limits, as established by OPA 90.

### **Conclusion**

OPA 90 significantly increases the costs that spillers are required to pay. All shippers must ensure that they can pay for the full scope of potential costs as outlined in the law.

It is said that "an ounce of prevention is worth a pound of cure." For vessel owners and operators insuring themselves against oil pollution or the threat of a spill, this is particularly true.

*ENS Gregory Rainey is a staff member of External Affairs of the National Pollution Funds Center, 4200 Wilson Boulevard, Suite 1000, Arlington, Virginia 22203-1804.*

*Telephone: (703) 235-4709.*

## **National Pollution Funds Center**

The use of a one-billion dollar oil spill liability trust fund was established under OPA 90 to cover certain uncompensated oil removal costs and damages incurred after marine oil spills by vessels or facilities. The administration of this fund was delegated to the National Pollution Funds Center, an independent Coast Guard unit established on February 20, 1991.

The National Pollution Funds Center is the fiduciary agent for the oil spill liability trust fund and the portion of the EPA super fund accessible to the Coast Guard. (The super fund was established by the Comprehensive Environmental Response Compensation and Liability Act for response and remediation of hazardous waste incidents.) Both are federally-managed funds that distinctly support liability and compensation regimes pertaining to pollution from oil or hazardous substances, respectively.

In accordance with OPA 90 and other pertinent laws and regulations, the National Pollution Funds Center conducts programs to accomplish five principal objectives:

- provide funding to permit timely removal actions;
- initiate natural resource damage assessments (oil only);
- compensate claimants who demonstrate that certain damages were caused by oil pollution;
- recover that which is owed by parties responsible for oil pollution costs and damages; and
- certify the financial responsibility of vessel owners and operators.



# MIB Update

January - February 1994

Volume I, Issue I

## Sex and The Seafarer

By MARTIN C. SEHAM, ESQ.

By virtue of a Supreme Court decision rendered in the latter stages of 1993, there has been a substantial increase in the exposure of Maritime employers to charges that they are responsible for sexual harassment based on gender. Seaboard, the problem will almost always involve charges levied by women. (*Harris v. Forklift Systems, Inc.* November 9, 1993. See related story on page three).

*Martin C. Seham, Esq., Senior Partner with the New York City-based law firm of Seham, Seham, Meltz & Petersen, has been a member of the bar since 1957. Mr. Seham's concentration is in Labor Relations; Public Utility; Litigation; and Trade Association Law. He is also a noted author on legal and legislative issues.*

A few short years ago the law of the land required that there be a personal impact on the individual employee of the allegedly harassing conduct. This particularistic approach was really undermined as early as 1986 with the Court decision in the case of *Meritor Savings Bank v. Vinson*. It has now had its culminating articulation in the *Forklift* case.

The standard, which the court represents as a "reaffirmation" of the *Meritor* case states that the law is violated when the workplace is permeated with discriminatory behavior that is sufficiently severe to create a discriminatory, hostile or abusive work environment. This does not mean that the *individual* is no longer protected from abusive treatment on the basis of isolated or private acts. In other words, the individual is not prey to depredations aimed at her exclusively. On the other hand, there need not be any single individual who is so affected by the workplace atmosphere that she cannot tolerate continued employment. Under the Court's ruling it is the oppressive quality of the total environment that must be judged. This valuation as to whether an environment is "hostile" or "abusive" comes by looking at all the circumstances. These may include the frequency of discriminatory conduct, its severity, the

*(Continued on page two)*



## Sex and The Seafarer

(Continued from page one)

physical quality of the conduct and its interference with work performance. Physiological harm still plays a role but becomes one of several relevant factors. To repeat the message again, the employer is responsible for the total quality of the workplace as one free from gender abuse.

As is true with most decisions of the Supreme Court, the details of the responsibilities placed on the employer will be left to the lower Courts as they are confronted with particular cases and individual complaints. There are, however, some observations we can make based on the general approach of American labor laws and "hints" that come from the Court's decision. For instance, it is well established that the propriety of various types of conduct is generally judged on the basis of the nature of the workplace itself. This kind of judgment comes up in cases involving discipline, insubordination, physical aggression and the like. Arbitrators and the Courts have generally held that a curse or a shove on the factory floor may be allowed where the same kind of conduct in the computer operations office would be grounds for

serious discipline.

As a matter of historical fact and literary embellishment, Seafarers at work are often diamonds in the rough. Language that would curl the hair of an accountant may barely make a ripple of reaction from the Chief in the engine room or any other seagoing position. Thus, we can say with some certainty that the workplace environment aboard ship is different from that expected in the other workplaces and allows the Seafarers a certain latitude of conduct. Nonetheless, we believe the total impact of the Court's decision will be to raise both the consciousness of females and the level of reasonably accepted behavior by male employees.

The Court actually makes a point of noting that a single epithet is unlikely to result in a sustainable charge but we believe that a pervasive course of using such language would invite a harassment charge against the company. We have encountered Seafarers who in ordinary discourse are able to interject the four-letter words between syllables as they speak. While linguistic dexterity of such a demonstration is to be admired, the toleration of that kind of language might very well be considered a "pervasive" practice.

Another example that comes to mind would be the display of Playboy centerfolds. The taping of these pictures to the inside of a personal locker would strike us as totally inoffensive. On the other hand, plastering a room with pictures of naked women might very well offend a female Seafarer and others as well.

In this regime of expanded responsibility, there are a few things a company may do to protect itself and comply with the law.


First there must be a written and published statement of the company's policy against sexual harassment. If a vessel carries women on the particular voyage, they can be "lightly" interviewed to discover whether there are any complaints. At the end of the voyage all the concerned personnel should be available and if there is a complaint, an appropriate investigation can take place. If there is some physical quality to the harassment — such as the posting of pornographic pictures — immediate action should be taken.

In short, as Willy Loman said in Arthur Miller's *Death of a Salesman* — "attention must be paid." In the Maritime context that is the best advice that can be given. No one in the Maritime industry can stand the nightmare of seeing the law on sexual harassment turn into another personal injury business. The best way to avoid that calamity is to pay attention and to take action.

*In related news...* Rep. Kennedy's (D-Conn.) H.R. 224 is currently pending in the Education and Labor and Judiciary Committees, while Sen. Kennedy (D-Mass.) has proposed S. 17 which is pending in the Senate Labor and Human Resources Committee.

These bills, titled the "Equal Remedies Act of 1993", would lift caps on punitive and compensatory damages in the Civil Rights Act of 1991 and the Americans with Disabilities Act. Current laws limit compensatory and punitive damages to \$300,000 for companies with in excess of 500 employees.

## THE 1994 MIB DIRECTORY



The 1994 MIB Directory is on its way! To defray the cost of publication, MIB is accepting advertising from corporate sponsors. This year's directory will feature over 3,000 listings and will be circulated among thousands of risk managers and human resource managers nationwide.

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## *Supreme Court Loosens Standard for Sexual Harassment*

The Supreme Court announced a broad definition of sexual harassment which will enable plaintiffs to win lawsuits without having to show that the offensive behavior caused psychological damage or left them unable to perform their jobs.

Previously a plaintiff had to show that sexual harassment made the workplace so hostile that it caused severe psychological injury or other damage. Now, sexual harassment may be determined to exist when the environment is perceived as hostile and abusive. No single factor is required to constitute the occurrence of sexual harassment.

The decision, *Harris v. Forklift Systems Inc.*, involved a manager, Teresa Harris, who quit her job after being the subject of sexual innuendos. Charles Hardy, the company's president, continuously made demeaning comments aimed at Ms. Harris. For example, Hardy asked her in front of other employees if she obtained a certain account by having sex with the client.

It is important for all managers to be aware that the Supreme Court has said a person's job performance does not have to suffer for there to be sexual harassment. In fact, a plaintiff does not have to prove a "tangible effect" from harassment. Instead, courts will look at all of the circumstances to determine if the workplace is a hostile one. These circumstances might include

- ✓ *Frequency of the discriminatory conduct*
- ✓ *Severity*
- ✓ *Is the behavior physically threatening or humiliating?*
- ✓ *Does the behavior interfere with work performance and/or cause psychological harm?*





# Newsletter

VOLUME 13, NUMBER 2

FEBRUARY 1994

## U.S. COAST GUARD PROPOSES RULES REQUIRING EPIRBs ON UNINSPECTED VESSELS

By Supplemental Notice of Proposed Rulemaking (SNPRM) the U.S. Coast Guard (USCG) proposes to amend the uninspected vessel regulations by requiring a 406 MHz satellite emergency position indicating radio beacon (EPIRB) on certain uninspected passenger vessels and vessels engaged as vessel assistance towing vessels. The proposed EPIRB requirements would apply to those vessels operating more than 3 nautical miles from the coastline or more than 4.8 Km (3 statute miles) from the coastline of the Great Lakes, with exemptions under specific circumstances. Exemption criteria, specified in detail in the proposal, relate to factors such as hours of operation, operating distance offshore, operation in company with another vessel, radio equipment carried on board and proximity to a VHF coast station.

A Category 1 (Float-free, automatic activation) 406 MHz EPIRB is specified in the proposal except for vessels less than 11 meters (36 feet) in length and vessels of any length with positive flotation. Vessels meeting the length and/or flotation requirement may substitute a Category 2 (manual activation) 406 MHz satellite EPIRB mounted at or near the principal steering station of the vessel.

The proposed rules would implement the "EPIRBs on Uninspected Vessels Requirements Act", requiring uninspected commercial vessels to carry alerting and locating devices, including EPIRBs, as prescribed by regulations. The proposed rules also address requirements for visual distress signals on all uninspected commercial vessels when operating in coastal waters.

Comments must be received by the USCG on or before June 17, 1994. Copies of the SNPRM have been mailed to RTCM members on the active Special Committee 110 list. Copies are available to other RTCM members on request to the RTCM Office by facsimile to +1-202-347-8540, by telephone to +1-202-639-4006 or by mail to the address listed on this Newsletter. Request Document ALFA WHISKEY ALFA.

## HAVE YOU RECEIVED YOUR SAN ANTONIO MEETING PROGRAM?

Copies are available from the RTCM Office, by FAX: +1-202-347-8540, by Tel: +1-202-639-4006 or by mail to the address listed on this Newsletter. Meeting is open to both RTCM members and non-members.

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## U.S. NATIONAL OCEAN SURVEY PLANS PRODUCTION OF DIGITAL RASTER VERSIONS OF NAUTICAL CHARTS IN 1994

The U.S. NOAA National Ocean Service plans to begin production of digital raster versions of its nautical charts in 1994. They are produced by scanning unscreened black and white film positives of color separates used in the chart printing process. The scanning is done at 762 dots per inch to produce files that also are used for computer-assisted chart revisions. Using software the scanned color separate files are registered together on a workstation. Each color separate file is assigned as color and a priority to produce a color composite on a computer screen that is similar to the corresponding paper chart. The digital raster nautical chart image is then geo-referenced to the earth's surface using the same projection system as the corresponding paper chart. After a lossless compression using NOS and shareware software, each nautical chart will fit onto two to three 3.5" floppy diskettes in an NOS format at 254 dots per inch. The NOS data set will include a documentation file and programs to display and convert the raster files to other formats such as PCX, TIFF and Scitex Handshake.

A new raster version will be issued concurrently with each new paper chart edition. The major uses for the raster files are expected to be as base layers in Electronic Chart Systems and Geographic Information Systems. The raster images probably will be distributed both individually on floppy diskettes and collectively on CD-ROMS for regional coverage. Final value-added features and distribution media are to be determined in cooperation with a Cooperative Research and Development Agreement (CRADA) partner from the private sector.

## U.S. FCC RULE CLARIFIES COMMERCIAL OPERATOR LICENSING

By final rule the U.S. Federal Communications Commission (FCC) has amended Title 47, Part 13 of the U.S. Code of Federal Regulations to specify that the FCC rather than Commercial Operator License Examination (COLE) managers will grant examination credit when appropriate and that applicants who desire examination credit must submit documentation supporting their request. Copies of the Final Rule are available to RTCM members on request to the RTCM Office by facsimile to +1-202-347-8540, by telephone to +1-202-639-4006 or by mail to the address listed on this Newsletter. Request Document ALFA WHISKEY BRAVO.

## U.S. FCC ANNOUNCES SHIP INSPECTION SCHEDULE

By Public Notice the U.S. Federal Communications Commission (FCC) has announced the schedule of ship inspection opportunities for 1994 in two listings: (1) FCC office locations near which inspections are generally available on request and (2) Other locations with specific inspection dates available. Copies of the Notice are available to RTCM members on request to the RTCM Office by facsimile to +1-202-347-8540, by telephone to +1-202-639-4006 or by mail to the address listed on this Newsletter. Request Document ALFA WHISKEY CHARLIE.



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January/February 1994

## BEND RATIOS CRITICAL TO CORDAGE, ROPE SAFETY

One of the most critical areas in any rope's application is the bend or D/d ratio. Any sharp bend in a rope or cord, under load, decreases its strength substantially. Simple knots, for example, are really a series of sharp bends and they can reduce a rope's strength by 50% or more.

As shown in Fig. 1, the D/d ratio is concerned with the bending of the rope or cord as it is worked in use. Most data provided on fiber rope is based on tests done under static loading conditions in a straight line pull; while the great majority of actual applications involve dynamic loading as well as having the rope bending while in its dynamic mode.

The most common bending mode is working over a sheave or pulley, as in a winch line, block and tackle or halyard. Not as often recognized are applications involving chocks, fairleads, bollards and cleats, winding on a drum and even the size of an eye splice. Under load, all of these situations result in fiber stress, friction and abrasion; and when the D/d ratio is too small these forces are intensified which can lead to accelerated wear and premature failure.

The basic D/d ratio is usually related to the use of a rope over a sheave. Generally accepted values are as shown in Fig. 2. These values relate to the rope being cycled, that is working over a sheave under load over a period of time; with the objective of providing optimum durability within reasonable size constraints. A larger diameter would be considered to result in less wear, while a smaller diameter would result in greater wear. The groove cross-section is also critical. A fiber rope tends to flatten somewhat under load so 10% should be added to the rope diameter to protect against excessive abrasion and friction by "pinching". A smooth, rounded section (Fig. 2) is best; although with high modulus fibers some engineers espouse a slightly flattened groove to reduce the tension differential between the inside and outside diameters. A sheave that is designed for wire rope is NOT recommended because the smaller V in the groove required to accommodate the wire can result in excessive abrasion of the fiber rope as it works over the sheave.

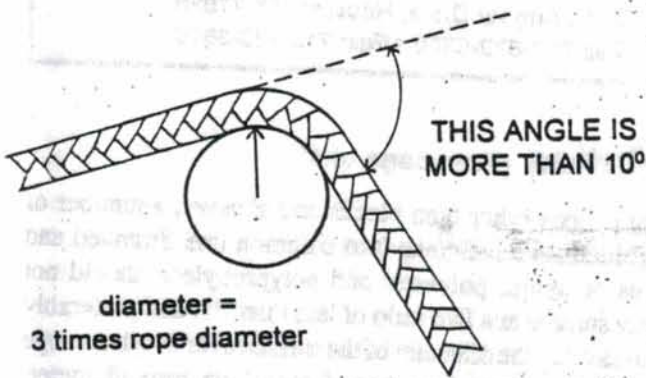


Fig. 1: Rope Bending Over A Bollard

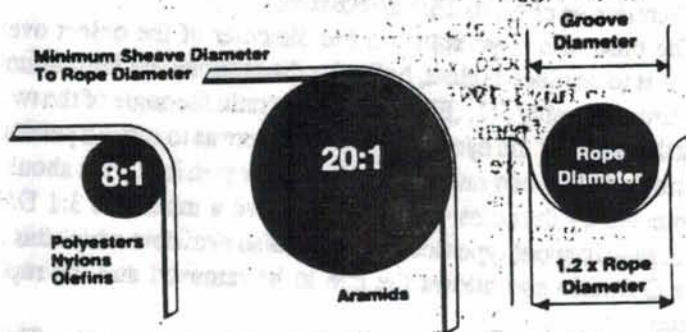


Fig. 2: D/d Ratios For Fiber Rope Over A Sheave

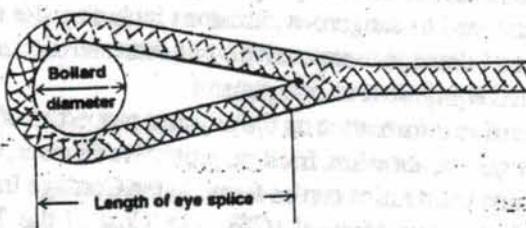


Fig. 3: D/d Relation of Eye Splice Over A Bollard

(to page three)



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617-253-0438**Technical****R&W Research and Testing, Inc.**5716 Armour Drive, Houston, TX 77020  
Tel: 713-672-8300 • Fax: 713-225-3615**Bend Ratios (from page one)**

For applications other than blocks and sheaves, a number of bend ratio guidelines have come into common use. Stranded and braided ropes of nylon, polyester and polypropylene should not bend over any surface at a D/d ratio of less than 3:1 and preferably 5:1. That is to say that the diameter of the surface over which the rope is bending should not be less than 3 times the rope diameter. Durability of the rope increases substantially as the diameter of the surface over which it is worked increases. It is generally felt that wirelay constructed fiber ropes using high modulus fibers should use D/d ratios as close to 16:1 as possible.

The ratio of an eye splice to the diameter of the object over which it is to be placed (cleat, bollard, piling) should be a minimum of 3:1 and preferably 5:1. (Fig. 3) With this ratio the angle of the two legs at the throat of the eye will not be so severe as to cause a parting or tearing action when under load. Wherever possible, eyes should be protected by thimbles which should have a minimum 3:1 D/d ratio. A plastic spool type thimble unit is also available which has a higher D/d ratio and allows the eye to be removed and the rope replaced.

The term "under load" has been used here frequently. This should always be considered to be the Working Load Limit (WLL) of the rope as determined by the selection of a design factor for a specific application and then using it to divide into the Minimum Breaking Strength of the rope to be used. The consequences of using undersized D/d ratios and stressing ropes higher than their Working Load Limits can lead to dangerous situations including life threatening "snapback", damage to expensive equipment and catastrophic failure of related equipment or components.

More extensive information on the physical properties of fiber and ropes, elongation, abrasion, friction, protective finishes, design factors, WLL and bend ratios can be found in the Cordage Institute Technical Information Manual (CIB 1/2). Cost of the TIM is \$25.00 plus \$5.00 shipping and handling. Send orders with check or money order to Cordage Institute, 350 Lincoln St. #115, Hingham, MA 02043.



# Lubricating wire rope

## ...inside, outside, around and through

By Barbara McGrath

*Getting a handle on the ins and outs of wire rope lubrication can be almost as tough as holding a well-lubricated rope while it's in use. A collection of experts in the field make the subject a bit easier to understand.*

**E**nvision wire rope as a complex mechanical system. Whether used as a dragline, tow line, elevator cable, or bridge guy line, it is made up of moving parts. Those parts are forced to continuously adjust to one another during often high stresses in hostile environments.

Consider a hoist rope on a large dragline. As the rope moves over the sheave, it is pulled, bent and compressed simultaneously. Metal to metal contact stresses the outside of the rope as it enters and leaves the sheave. Inside, wires contort and abrade one another.

Sometimes the hoist rope is forced to then move over another sheave in a reverse bend. The closer the two sheaves are, the more stress the rope will experience because the strands will not readjust themselves.

### The best lubricant for the job

Almost anyone in the wire rope industry would agree that, with few exceptions, wire rope needs lubricant protection.

According to the Roebbling Wire Rope Handbook<sup>1</sup>, fatigue tests were conducted with two sections of 9/16" dia. 6 x 19 wire rope. One was lubricated and one was dry. The lubricated rope lasted 2.4 times longer on the 10" tread dia. sheave, and 5.2 times longer on the 24" tread dia. sheave.

	10" Tread Dia. Sheave Sheave/ Rope Dia. Ratio = 18	24" Tread Dia. Sheave Sheave/ Rope Dia. Ratio = 43
Dry Rope	16,000 Bends	74,000 Bends
Lubricated rope	38,700 Bends	386,000 Bends

But when users and manufacturers begin to discuss specifics, such as types of lubricants, additives, environmental

issues and application methods, opinions diverge.

For instance, here are some basic lubricant compounds used for manufacturing or re-dressing:<sup>2</sup>

- asphaltic
- petrolatum based
- combination (asphaltic and petrolatum)
- soap (stearate) thickened
- inorganic thickened
- greases (pumpable)
- amorphous polypropylene
- resin based
- linseed/castor oil

And here are some of the additives:

- corrosion inhibitors
- anti-wear additives
- water displacing additives
- polymers (tack & adherence)
- plasticizers (low temp)
- anti-oxidants
- polar additives (wetting)

Lubricants must not be highly acidic or alkaline, which can deteriorate the rope and threaten the environment.

### Hostile environments

Key to choosing the correct lubricant is knowing the rope's application and in what environment it will be used.

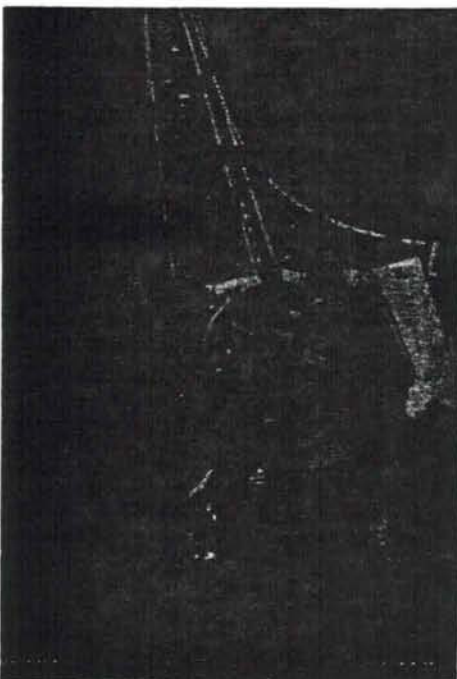
For instance, with applications like the dragline discussed above, the lubricant must have additives that cause it to remain pliable as the rope is used. As the strands inside the rope move against each other, the lubrication can wear off in spots. "A good lubricant will redistribute itself evenly between the strands—a characteristic known as 'self-healing,'" says Bill McAlaine.

The marine environment is one of the most hostile for wire rope. At sea the wire is subjected to high corrosion from wind-blown salt air, as well as from short immersions in salt water during lowerings. The zinc corrodes first, and how quickly it corrodes depends on a number of factors:

—the depth of water in which the rope is used. Oxidation is a kind of corrosion.

The closer the rope is to the surface of the water, the higher the temperature, and the more reactive the oxygen is. So, the rope will corrode faster when it is closer to the surface of the water.

—the temperature and chemical content of the water. In a study by Grignard Company in 1969, with the assistance of the Woods Hole Oceanographic Institution, Oregon State University, the Halan Company and U.S. Steel, an experiment was performed where specimens of bright steel wire, galvanized wire and electromechanical cable were submerged for three months in three different locations. The results showed "accelerated rates of corrosion...ultimately traced to a combined effect of chemical levels in the water and the temperature of the sea water."<sup>3</sup>



Lower viscosity lubricants can be sprayed or poured, as shown here on the Mid-Hudson Bridge. (photo by Grignard Company)



Location	Solids (Sodium Chloride)	Temp.
Oregon	3.71% Total Solids	44°F
Mass.	3.61% Total Solids	40°F
Antigua	3.98% Total Solids	84°F

### How thick, how hot?

In many applications, the lubricant's tolerance to fluctuations in temperature is a major concern. In hot desert climates, for instance, the wrong lubricant will literally drip off the wire. At low temperatures, it may flake or crack.

Lubricants vary in viscosity, and viscosity always varies with temperature.

"There are many different standards for measuring lubricant viscosity," explains Bob Kirkpatrick, President of The Kirkpatrick Group, Inc. Most commonly used are: "NLGI" (National Lubricating Grease Institute), "Saybolt" (Sus), and "Centistoke" (Cst). Laymen and experts alike have difficulty making conclusive comparisons between the standards. There are few, if any, complete comparison charts that provide accurate cross reference between the standards. Most lubricant manufacturers use only one or two measurement specifications when preparing technical data. To avoid confusion...we...use the terms "Pourable" for low viscosity and "Nonpourable" for high viscosity when referencing given wire rope dressing

ranges. Pourable (Low Viscosity) wire rope dressings range from SAE 90 weight oil density upwards to NLGI #0 a near equal to molasses. Nonpourable (High Viscosity) wire rope dressings range from NLGI #1 (consistency of soft butter) to NLGI#3 (consistency of thick peanut butter).

"Ambient temperature must be considered when measuring dressing viscosity...As an example: NLGI pourable dressing grade #0 at 85 degrees may easily become #1 or #2 nonpourable at 40 degrees. Prior to operation, check your

viscosity...In extremely cold temperatures, it may be necessary to pre-heat wire rope dressing to assure it is easily pumped and applied to the wire rope."

Where ropes are being stored, Nonpourable lubricant may protect the rope with a heavier film. Relatively recent advancements in pressure lubricators manufactured by companies like The Kirkpatrick Group make it possible to force heavier oils into the inner parts of the wires. When this is possible, it is sometimes preferable, since more highly viscous lubricant affords greater strand-

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### Numerical Relationships Among Viscosity Classification Systems

ISO VIS Grade	SAE Crankcase Oils	SAE Gear Oils
2		
3		
5		
7	5W	
10		
15		75W
22	10W	
32	20	
46		80W
68	20W	
100	30	85W
150	40	90
220	50	
320	60*	
460	70*	140
680		
1000		250

\*Not part of SAE classification



to-strand protection.

But, for certain applications, and where a pressure lubricator is not available, thinner oils are preferred. They can be applied by spraying or simply pouring, and drip into the inside of the rope readily. Lower viscosity lubricants must be re-applied frequently.

*In confined spaces, or where motors might produce sparks, avoid using inexpensive petroleum solvents. They have a low flash point, which can present a serious fire hazard.*

#### From the first drawing

Before considering field dressing (re-lubricating), a user may need to start where lubrication begins: with the wire rope manufacturer (OEM). At intervals while the rope is manufactured, the OEM applies lubricant. This lubricant differs from the type used to re-dress the rope. But it is important to be aware of the OEM lubricant applied, since the re-dressing lubricant may interact with it, causing unforeseen problems.

The type of lubricant and the amount added is determined by the manufacturer based on his information about the future use of the rope.

"A wire rope may be lubricated at three intervals during its manufacture," explains Bill McAlaine, v.p. & business manager of Allied Kelite, "once at 'stranding' (when the wires are joined to form strands), once at 'closing' (when the strands are formed to make rope)

and sometimes after the rope is made, to provide an added level of protection.

"As the wire is drawn, it passes through a 'soap', Bill adds. "which is designed to facilitate lubrication between the wire and draw dies.

"However, it is not designed to protect the wire in use. If anything, it actually causes us problems, because the soap left on the wire often absorbs water. (Many drawing soaps contain borax, which is highly hydrophilic.) Applying a lubricant at stranding over a moisture laden soap/borax film can cause moisture encapsulation and result in premature corrosion. We build water displacing properties into our stranding lubricants, which helps address this problem. However, the best practice is to take the last wire reduction without lubricant to help minimize the amount of water-absorbing residual film left on the wire surface."

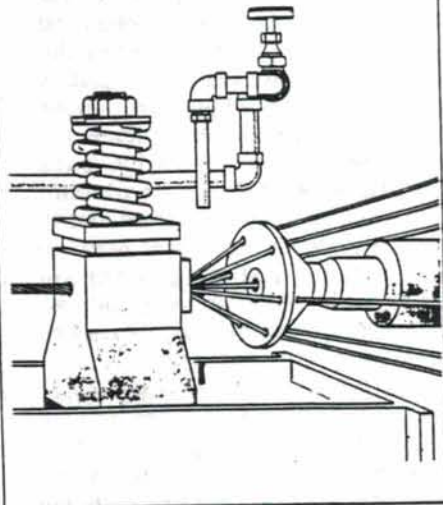
If a termination is added, lubrication should be re-applied. "It is important that the juncture of the strand and socket be inspected periodically," advises Emile Grignard "because of torsional twisting, which subjects it to corrosion."

#### The core of the problem

Once the customer receives new rope, he should store it inside a building and away from direct sunlight, or at least cover it with a tarp if it has to be left outside. Turn the storage reel periodically to prevent the lubricant from seeping to

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Low Temperature



The OEM often lubricates the rope during stranding and closure, and sometimes again after the rope is manufactured.

the bottom, especially where temperatures are high or the lubricant is very fluid.

When the rope is put to use, field dress it immediately. Like devious enemies, moisture and pollutants can invade the wire quickly, corroding the core of the rope. (Note that we are referring to a

*(continued)*

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wire, rather than fiber, core.)

"Corrosion damage is impossible to estimate and must be avoided in order to maintain necessary strength and safety. A corroded rope is reduced in strength for various reasons. First, metallic area is lost by chemical or electro-chemical action. Second, corrosion mars the smooth finished wire surfaces, resulting in erratic contours which form stress raisers. These stress concentrations are very susceptible to failure by crack propagation as the rope bends and stretches during operation. Third, corrosion hinders normal movement between wires, creating a binding condition which increases stresses to an indeterminate extent and speeds corrosion-fatigue fracture growth."<sup>1</sup>

A major concern in re-dressing should be the compatibility of the lubricant with the OEM lubricant. Incompatible materials can cause dangerous results: the re-dressing lubricant may not penetrate the wire sufficiently; components of the OEM lubricant may leach out; or the reapplied dressing may flake away.

*If in doubt, consult the OEM. According to law, the wire rope manufacturer should tell the customer how to field dress the rope.*

And, cautions Al Lucht, president of Wire Rope and Metallurgical Engineering Services, "a basic requirement for all lubricant is that it must stick to the rope and not fall off. Strange as it may seem, this is not always an easy problem to resolve. One can read all the advertisements and listen to the vender, but the only way to find out is to use the wire rope and try it in the intended application. If the lubricant does not stick (adhere) it will do absolutely no good at all."

Here are some lubricant related field problems:<sup>2</sup>

*adherence*

- Film is too heavy for the rope speed.
- Field dressing or rig wash is softening the film.
- Stranding lubricant is wrong.

*corrosion*

- Lubricant is poorly matched to the environment.
- Film thickness is wrong.
- Adhesion and film integrity are poor.

*low temp. flaking*

- Lubricant is wrong for the application.
- Lubricant was overheated during application.
- Film thickness is wrong.

*dry rope*

- Field dressing is inadequate.
- Penetration at the "point of twist" during the manufacturing process is poor.

*dry core*

*melt-off/throw-off*

- Field dressing is wrong.
- Melting point is low or viscosity is above the melting point.
- Film thickness is wrong for application or temperature at which it is being used.

*internal wear*

- Rope is dry.
- Contaminants are infiltrating rope.

*wash-off*

- Field dressing or OEM lubricant is wrong.

In the worst scenario, the wrong re-dressing compound will form a solid film in the valleys of the outer layer, insidiously trapping moisture and dirt in the rope, and causing it to deteriorate faster.

**Re-lubricating: how often?**

Testing is key to finding out how well the lubricant is protecting the rope, and establishing a re-lubricating schedule.

Since each rope application varies, it is impossible to specify a uniform re-dressing time interval. It depends on many factors, including the type of load, frequency of use, and kinds of environmental exposures.

For certain ropes used consistently in the same environment and under the same conditions, rope re-dressing can be performed at reasonably predictable intervals. For instance, when using a hoist dragline, frequent lubrication is a must.

"As a general rule, the entire length of the rope should be lubricated every eight hours on a machine operating continuously. This procedure will vary depending on temperature. And lubricant temperature depends on ambient temperature, which can be affected by wind, heat sources and humidity...An average dragline uses about 55 gallons of wire rope lubricant per month."<sup>4</sup>

But in many cases, the rope needs to be visually checked frequently for broken wires and corrosion. Even stationary wire rope like guy wires and suspension cable should be inspected periodically because of damage caused by atmospheric contaminants. It is vital that the lubricant is soft so that it can be easily wiped from the rope surface. Lubricants that harden cover defects, presenting a hazard. They can indirectly cause serious injury or death.

Here is a sample visual inspection for galvanized rope used by Grignard Company:

Periodically the wire rope should be visually inspected to determine the condition of the strand, and if there is a question on the coating, the following procedure should be followed:

—Remove the residue that is present with a pencil eraser or fine steel wool, but don't use too much pressure that will remove the coating.

—Make a concentrated solution of copper sulfate with water (dark blue) and

apply it to the test area with a saturated cotton ball or cloth. Wear rubber gloves. —If there is no chemical reaction, the coating of lubrication is present. If the test area turns black, the coating is not present, but zinc is. If it turns copper color, then there is no zinc or coating present."

**Re-lubricating: how much?**

As a general rule, it is better to re-lubricate lightly and frequently rather than heavily and infrequently. The concern should always be keeping the inside strands lubricated consistently.

"Flooding a rope haphazardly, then permitting it to run dry between these erratic applications, does not offer as good protection as small, yet frequent additions of fresh lubricant."<sup>1</sup>

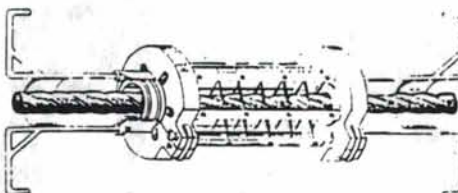
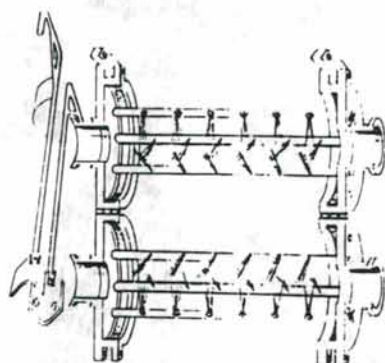
Traditionally, lab tests have been used to evaluate lubricant effectiveness.

"The laboratory tests often do not evaluate a rope under load. Consequently, they are not able to determine the extension of rope life with proper lubricant usage.

"A better method of evaluating lubricant effectiveness is to test a rope by the NDT procedure at periodic intervals throughout its service life. The rope is passed through a sensor head that determines the rope's loss of metallic area (LMA) and local faults (LF) such as broken or missing wires. The NDT method, while not eliminating the visual rope inspection, provides advantages in that it allows determination of the structural integrity of the internal rope parts and requires less downtime for testing. Researchers at the Bureau of Mines Spokane Research Center evaluated NDT data on various ropes by comparing the LMA and LF and noting the trends."<sup>5</sup>

**And...how?**

Once the wire rope is in use, a major



Cable cleaners like the Universal Cable Cleaner have brushes to clean the valleys of the rope, where dirt is embedded. (photo by Grignard Company)



concern when re-dressing should be first removing the water and dirt that has become trapped in the rope. If the rope is lubricated without first being cleaned, the existing moisture and pollutants will still cause corrosion and abrasion. And, they will prevent the lubricant from adhering to the rope uniformly. As a result, the rope will deteriorate faster.

There are many cleaning methods. Any good method should remove dirt and liquids not only on the surface, but in the "valleys" between the strands, where it can become embedded, and work its way inside the rope.

As mentioned before, a primary concern in preparing a rope or cable to receive a field dressing compound is that it is free from entrained water. Re-lubricating rope without first removing internal moisture will, rather than inhibiting corrosion, accelerate it. Some wire rope dressing compounds now contain additives that will combine with water to prevent corrosion.

Here is a sample cleaning and re-dressing procedure:

—Strands must be examined for any build up of residue in the valleys between the wires. If, upon examination, there is a build up of residue in the valleys between the wires, the valleys must be cleaned with a cable cleaner to allow the lubricant to penetrate the outer wires into the core of the cable and to combine with entrained water.

—If the residue of old lubricants and coating is just present on the crowns of the wires, then a wire brush may serve the purpose.

—After the valleys are free of any residue that would restrict the flow of lubricant, they should be dressed.

—If there is a large salt deposit in the valleys of the wires, a fresh water wash forced air dry procedure should be used.

—Follow recommendations concerning the temperatures of the rope and atmosphere required when applying lubricant.

Cleaning systems are available to remove old lubricant and grit while the rope is in use. Most scrape the rope clean as it passes through the system.

Lubricating can be done many ways, including wiping and spraying. But a lubricating system is usually preferred. A good lubricating system re-dresses the rope uniformly with less lubricant waste. With pressure, it forces the lubricant into the core, where it is needed most. And the higher the pressure, the deeper the lubricant penetrates, especially if the strand is under tension. Like a cleaning system, it can also be used while the rope is in use, cutting downtime dramatically.

#### Imperfect pitch

Concern about lubricating wire ropes began only in fairly recent history, according to Al Lucht. As Chief Wire Rope Engineer of American Steel and Wire (U.S. Steel) in 1963, he first became



High-pressure lubrication systems can clean and lubricate rope while in use. The Kirkpatrick Wire Rope Lubrication System, shown here, lubricates rope travelling up to 250'/min., depending on lubricant viscosity. (photo by The Kirkpatrick Group)

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aware of extensive problems with wire rope corrosion and oxidation. Back then, lubricants applied while manufacturing wire rope were basically asphaltic.

"AS&W had extensive files which dated back to the late 1800's. In a random perusal one day, I read a report dated around 1913. Wire ropes were used extensively with sailing vessels (windjammers) used to carry freight across the oceans. At that time AS&W had a wire rope mill in Worcester, Massachusetts where it was the practice not to coat wire ropes. They were furnished dry without any lubrication. Naturally, these ropes, when used on sailing vessels traveling the salt water seas, corroded rapidly."

The report stated that hemp ropes, which were coated with pitch, lasted much longer. AS&W began coating their wire ropes with pitch obtained from Jamaica. Life of the wire ropes remarkably improved.

Years later the pitch was replaced by asphalt, which was a bi-product of oil refining. Asphalt, the dregs of the refining process, didn't resist corrosion well, was a poor lubricant, and differed from shipment to shipment—but it was cheap.

"When I entered the scene," Al Lucht says, "[research and development] was mixing different types of lubricants such as petrolatum (petroleum jelly) and asphaltic and adding anti-oxidants, etc.,

to try to improve various characteristics." But there was a problem in that the mix varied with the person mixing.

"To help resolve our problems, our Monroeville, Pennsylvania Research Laboratory developed a specification for a petrolatum-based general purpose lubricant which was then used for 90% of our products. It was very successful. Our rusting and corrosion problems and oxidation problems disappeared as if by magic."

Various compounds were added to the mixture, including corrosion inhibitors, anti-oxidants, water displacing additives and compounds designed to withstand very high pressures.

#### Lubricants for the '90's

In recent years, the spotlight has turned to environmental issues. In marine use particularly, regulations require that the lubricant does not leave a sheen on the water surface. Also, disposal of lubricant containers, and even the lubricated wire rope itself, is now an environmental consideration.

"The use of additives is like going to the drug store and taking pills to counteract whatever ailment you have or do not want to get," Al Lucht says. "This era has seen a big change in the quality of lubricants used for wire rope. The lubricants cost more. But they are good and present a savings in wire rope use."

<sup>1</sup>Roebbling Wire Rope Handbook, The

Colorado Fuel and Iron Corporation, 1966.

<sup>2</sup>Provided by Allied-Kelite, A Witco Company.

<sup>3</sup>Handbook of Oceanographic Winch, Wire and Cable Technology, Second Edition, Alan H. Driscoll, ed., 1989.

<sup>4</sup>"Making Wire Rope Last Longer," by K. L. Barden and F.J. Klaus, Coal Age, March 1972.

<sup>5</sup>"Evaluation of Lubricants to Increase Wire Rope Life," by Jack E. Fraley and Grant L. Anderson, Spokane Research Center, Bureau of Mines, U.S. Department of the Interior, Spokane, WA.

Special thanks to those who contributed information for this article:

•Emile Grignard, president of Grignard Company, Inc., New Jersey, manufacturing the Pre-Lube series of wire rope lubricants.

•Robert Kirkpatrick, president of The Kirkpatrick Group, Inc., Texas, which designs and sells lubrication systems.

•Wilbert A. (Al) Lucht, president of Wire Rope and Metallurgical Engineering Services, California; and retired Chief Wire Rope Engineer of American Steel and Wire (U.S. Steel).

•William McAlaine, V.P. & business manager of Allied Kelite, A Witco Company; and formerly general manager of The Hodson Corporation, specializing in formulating and marketing wire rope lubricants. ■

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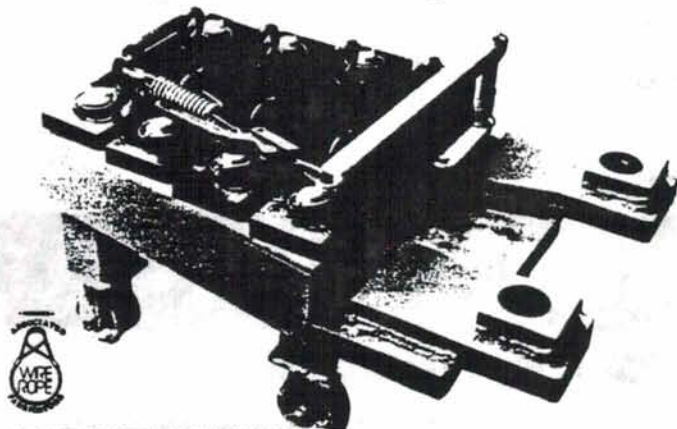
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# Cutting the costs of building to U.S. requirements

**F**OR some time, leading U.S.-flag operators such as Sea-Land Service and APL have maintained that a maze of U.S. Coast Guard regulations makes building or reflagging ships to U.S. registry requirements unnecessarily expensive. They have claimed that it can cost \$10 million more to build a ship to Coast Guard rather than international standards.

APL and Sea-Land have 13 container-ships under construction outside the U.S. Both would like to flag them U.S., but are unlikely to unless U.S. Coast Guard regulations are substantially altered.

Now the Coast Guard seems to have heard what the industry is saying. And a new buzzword has emerged. It is: "equivalency."

Vice Admiral Arthur "Gene" Henn, the Coast Guard Vice Commandant recently criticized APL and Sea-Land for complaining about the incremental costs of building to U.S. requirements while allegedly overlooking the considerable cost-savings possible by acquiring foreign-made components acceptable to the Coast Guard as equivalent to those built in the U.S.

Henn insisted, "If you don't take advantage of equivalency provisions, if you use a monkey-see, monkey-do approach, then there can be a \$10 million difference. But if you use U.S. C.G. equivalency provisions, you come up with a delta of basically no difference in costs."

In fact, he insisted, "if we can't get [the difference] down to \$100,000, then all of us ought to be fired. Quite simply, you can do it smart and do away with the delta, or be not so smart and pay additional money."

Today, said Henn, "We do things with equivalencies that the U.S.C.G., back when I was a lieutenant commander, thought of as heresy. Now you can do a handshake on it, so long as it's legal, ethical, and fair. Anything that is, we'll O.K. in a heartbeat."

Things may not be quite as simple as Henn implies. In an ideal world, anyone wanting to know if a particular type of, say, foreign made piping was acceptable as U.S.C.G. equivalent would merely look in a manual, as is routine with classification society approvals. Unfortunately there is no such printed Coast Guard source of information.

All that can be done is to ask if the item is equivalent. If the Coast Guard

doesn't come up with the answer, a costly engineering analysis will be required. According to APL Vice President Gene Pentimonti, this could cost about \$1 million.

Captain Gordon D. Marsh, Chief of the Coast Guard's Marine Technical and Hazardous Materials Division, tells Marine Log that one reason that engineering equivalency analyses are costly is that the industry itself urged the Coast Guard to treat the results as proprietary data. Thus the Coast Guard can't tell Shipowner X that an item is equivalent, even though Shipowner Y has already demonstrated its equivalency via analysis. Shipowner X is thus forced to carry out a costly duplicate analysis.

The good news is that an agreement has now been reached by all parties involved, including the Shipbuilders Council of America, that at least some of this information can be made much more readily available.

### CLASSIFICATION SOCIETIES MAY DETERMINE WHAT'S EQUIVALENT

Captain Marsh is the point man on equivalencies and is the final arbiter of what is acceptable. One project that he's now working on is delegating to classification societies some of the Coast Guard's authority to accept equivalencies. With that accomplished, he insists, "a lot of this problem will disappear, because one of the problems associated with U.S.C.G. requirements and how they're implemented on vessels is that we don't develop lists of type-approved vendor equipment, while the class societies do."

For starters, ABS will receive this new authority, but it is likely to be joined later by Det Norske Veritas and by Lloyd's Register.

Captain Marsh notes that the traditional "high cost-drivers" have been so-called U.S.C.G.-Approved Equipment for Lifesaving. The Coast Guard has refused to accept testing to other flag-administrations' implementing standards as equal to the testing it required at U.S. labs or at the few European labs it allowed to be used.

For active firefighting equipment, the Coast Guard accepts manufacturers' systems in total, then looks to organizations such as Underwriters' Laboratories (UL) for the components.

But the Coast Guard will now look closely at what standards other flag-administrations are applying and what sort of test procedures they require to see if it can reverse its classic position

on this issue, at least in some cases.

Classification societies traditionally make SOLAS evaluations of the component and material levels of piping and electrical systems on behalf of flag-administrations. But U.S.C.G. regulations are heavily dependent on domestic standards such as ASTM, ASNE, and the National Electrical Code, and organizations such as UL.

Captain Marsh concedes, "This has always caused a problem for overseas construction because the supplier base for an overseas shipyard is not familiar with U.S. domestic materials standards."

One odd aspect of equivalency is this: There are only *some* items for which the Coast Guard has formal standards, such as high pressure steam systems, steering gear systems, ballast and high pressure hydraulic systems. But there are a lot of other areas, such as cooling water systems and lube oil systems, where there are no such standards.

Even so, many parties escalate their compliance costs by subjecting even non-required systems to testing, because, says Captain Marsh, "they're in a rut."

He adds: "We intend to be much more flexible in what's required in these standards comparisons and essentially allow classification societies to make the call on whether an item is or is not equivalent, rather than the Coast Guard being the final authority. The societies will determine the level of data and analysis that they feel is needed to reach an equivalency determination."

U.S.C.G. requirements not required by classification societies or SOLAS will be scuttled. One prime example is a half-century old U.S.C.G. requirement for cargo ships to have a third bilge pump. SOLAS requires only two.

Not everyone is likely to be happy about easing equivalency. As reported in our March issue, the National Shipbuilding Research Program's Panel SP-6 on Marine Industry Standards is backing a research program aimed at eventually creating a data base identifying foreign standards for shipbuilding equipment, materials and components and comparable standards accepted by the Coast Guard for U.S.-flag vessels. That has drawn fire from a U.S. marine equipment manufacturers group, the Marine Machinery Association. Last month it wrote letters to Deputy Secretary of Defense John M. Deutch asked that DOD "see to the early termination of this wasteful and harmful research program," which it sees as encouraging U.S. yards to use foreign products.

by Joel Glass  
Washington Editor



# A better way to secure crane wire ropes, wedge and socket connection problem appears solved

The double saddle clamp shown in the accompanying Fig. 1, was invented by Timothy G. Galarnyk of Eau Claire, Wisconsin. He has applied for a patent on the clamp, which we described and illustrated in our October 1993 issue, pages 10 & 12. Now trademarked the "Piggyback" clip, it will be available exclusively through Columbus McKinnon Big Orange hardware distributors.



Fig. 1.

For decades the method of securing wire rope on a wedge and socket connection has been less than acceptable. However, it now appears this concern has been satisfactorily resolved.

The development of a double saddle rope clip ("Piggyback"™) by an 18 year veteran in the heavy construction industry appears to be a resolution to this problem. Crane and rigging experts, such as Bob De Benedictis agrees it's the best answer. All testing done by the manufacture of the "Piggyback"™ clip have shown no adverse effects to the rope.

Figure 1 illustrates the new clip. The clip uses two rope saddles and a long "U" bolt to secure the dead end of the rope while holding this dead end to the live line - without compressing the live line.

At least three prior methods have been used which posed various problems and hazards.

Figure 2 illustrates a loop method of securement. Common problems with this method include: A) The loop catching on other rigging or on equipment such as a pile driving hammer and leads, resulting in a dangerous disruption in the load hoisting. B) The dead end loop, left unsecured, vibrates and eventually shears off at the wedge top and becomes airborne producing a serious safety hazard for personnel and equipment. C) The use of excess rope is required for this loop method. D) As the rope diameter increases in size, the function of the loop becomes more difficult.

Figure 3 illustrates the use of a short piece of wire rope clipped to the dead end. Problems with this method include: A) Vibration produces the same shearing problem as occurs with the loop method. B) This method also may catch on other rigging or equipment. C) Excess rope is wasted when producing the short rope piece.

Figure 4 illustrates the use of a single rope clip securing the dead end



Fig. 2.



Fig. 3.



Fig. 4.

to the live line. The biggest problem with this method is: A) Crimping the live line negatively affecting the live rope's rotation, elasticity and strength. B) Attachment of this clip to the live line commonly produces a load transfer from the live line to the dead end which seriously affects the integrity of the wedge/socket connection. C) whenever the socket is removed and then reassembled, the rope must be cut to remove the section from the live side that was distorted and crushed by the clip.

Figures 1, 2, 3 and 4 use a 6 strand rope and follow recommended procedures for length etc.

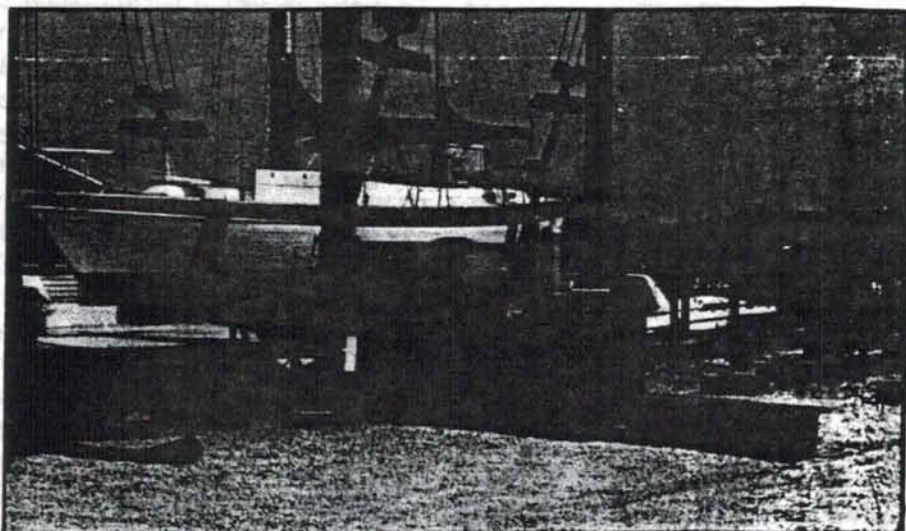
The new "Piggyback"™ clip has been designed to overcome the disadvantages of prior methods. The double saddle of this "Piggyback"™ clip is made to allow the live section of rope to freely pass through one saddle of the clip. The live line is allowed to freely rotate and remain flexible with the "Piggyback"™ clip is attached. There is no compression or load on the live line. The dead end is clipped securely with the second saddle thus curing this connection.

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The RGF Environment Systems has been active in the marine field since 1985, keeping marina owners, boat yards and other interested people alerted to the latest EPA regulations and compliance.



Pictured above is the Ultrisorb water recycling unit manufactured by RGF Systems to recycle the water left from washing boat bottoms to EPA standards. Over 1,000 of these units are said to be on location throughout the world.

## EPA Makes Waves

Recent expansion of environmental laws and regulations regarding discharge of water containing contaminants impact both the boat owner and the marina operator. Boaters for the most part usually try to be environmentally responsible in the operation of their crafts. Likewise, marina operators realize that their livelihood comes from the water and clean water is important. The new laws and regulations make it imperative that all boaters and marina operators recognize their impact on the environ-

ment, and assure that their impact is minimized under all circumstances.

The Clean Water Act and the EPA regulations which it has produced now require that the discharge of all contaminants into or onto the nation's waterways be controlled. In the past decade large industrial dischargers, usually identified by the EPA as "point sources," were forced to clean up their acts. Now non point sources of discharge, such as that resulting from storm water runoff, are being targeted. Boat bilges are one potential source of contaminated storm water runoff. Fueling operations, boat cleaning, winterizing, maintenance

and repairs, improper storage of items such as solvents, used oil, and old batteries, and bottom painting are typical marina activities which can produce contamination. Storm water can wash this contamination into the ground or nearby water. Under current rules such discharges can result in clean-up costs, fines and even criminal prosecution when flagrant violations are detected.

Owners of boats and marinas can expect little sympathy if caught discharging any contaminated water overboard. Even an ounce or less of light oil mixed with the bilge water will produce a visible sheen on the water. This is identified by the EPA as a reportable discharge (800 numbers exist for the owner, or anyone else who witnesses such a discharge, to report it to the EPA). An automatic bilge pump which dumps oily bilge water overboard can quickly place a boater at odds with the EPA. For even a small discharge large fines are possible, since the EPA tends to try to set examples for others in the actions. Clean-up costs can also result, which are in addition to the fine. Offenders identified as chronic can face more serious consequences in the form of civil and possibly criminal actions brought by state or federal agencies.

The solutions of the past are no longer sufficient to assure that contaminants do not reach the waterways which we use. Such common

*(continued on page 34)*



## EPA MAKES WAVES

*begins on page 30*

solutions as having a package of oil sorbent material bouncing around in the bilge cannot assure that oil and other potential contaminants such as grease, solvents, and other substances are removed from the bilge water prior to discharge. Although the oil sorbent bundle may be capable of separating oil which it contacts, it is not likely to contact all oil, especially when storm water quickly enters the bilge and must be pumped out quickly. Also, oily sand and grit which is in the bilge will be pumped overboard without any impact from the oil sorbent material.

**Marina operators** are constantly faced with potential problems resulting from overfills when fueling boats at their docks, spills resulting from boat mechanical work such as oil changing, winterizing, spring make-ready, bilge drainage while boats are in dry storage, cleaning operations, painting, and many other normal work activities. Contaminants can either enter the ground on which the marina sits or runoff to the local waterways. Both pose problems to the marina. Should the contaminants seep into the ground the land will gradually become contaminated. When the land is sold an environmental survey will be required and the contamination will be discovered. At this time the current owner will be faced with the cost of removing the contaminated soil at his expense. Currently contaminated soil removal and disposal costs are in the \$300 per cubic yard range. It is likely they will increase with time. If the contaminants are washed from the property with storm water runoff and detected, the marina operator faces fines and clean-up costs. It's a no-win situation.

**Are solutions available** to the boat owner and the marina operator? Yes! The solution is to proceed with a three-step program. The steps are simple and logical. First, try to eliminate any possible sources of contamination. Second, try to eliminate or minimize dis-

charge through purification and reuse of the water (recycle water just like cans and bottles). Finally, if elimination and reuse is not possible, such as in the case of storm water discharge from the bilge, then apply modern technology to remove the contaminants prior to discharge.

**The boat owner** should install a bilge purification system to process all bilge water prior to overboard discharge. The system will be sized to accommodate the normal capacity of his bilge pump system and designed to remove oils, greases, and solids in an efficient manner. The RGF MINISORB system is one solution specifically designed for boat bilge applications.

**In addition** to the installation of an overboard treatment system, the boat owner should also strive to eliminate unnecessary fouling of his bilge. Bacteria growth can be kept in check by occasionally adding some chlorine in the form of bleach or other commercial products designed for this purpose. The residue which remains trapped in the bilge purification system is conveniently removed, usually annually after the completion of the boating season. The main absorbent media is where the grease and oils will collect and it should be disposed of properly (like one would dispose of an auto filter). The solids which have been collected should also be disposed of in a similar fashion if they contain grease and oils.

**The marina operator** is faced with several alternatives with regard to his environmental problems. The problem of overfilling can be solved with an overflow catch system and sound refueling procedures. A simple catch system is a funnel-like device which fits over the fuel dispensing nozzle and is connected to a small tank to catch overflow. A small suction attachment is also placed over the fuel vent, with a hose again feeding back to the small tank. This system effectively prevents any overflow from dumping into the water. However, it cannot handle overflows from situations where the individual props the nozzle of the diesel line at

full open and leaves the area. This must be prevented through application of good fueling procedures which are strictly enforced. The high cost of a 50 gallon diesel clean-up when spread over an area of marsh land necessitates procedures be enforced, even to the extent of losing a customer who refuses to comply.

**Additional options** which a marina operator must consider would include the installation of a drain pad which collects wash water and other substances such as paint from marina operations. The water collected can be processed through a water recycling system such as RGF's ULTRASORB line and no discharge results. Testing has also been successfully performed on RGF's systems which are designed to process the water for discharge. The testing was performed by government agencies at large commercial fishing boat yards. The RGF recycling systems eliminate the need for runoff permits (required after March 1992) and reduce the possibility of a contaminated release. The RGF discharge systems allow permit limits on release of contaminants to be met where water cannot be recycled. The only other option available is to cease to perform any operations which could result in a waste stream. This would severely limit a marina's operations and revenues.

**The EPA Storm Water** rules require the marina operator to have in place an emergency plan and equipment to respond to a spill. A risk evaluation is performed to determine the worst type of spill which could reasonably be anticipated. An emergency plan to handle this spill would then be required to be in place and personnel trained to respond. Emergency response kits can be constructed and stocked by the marina operator or can be purchased as a unit. Many factors influence the type of spill which may be possible and the quantity of contaminant which may have to be contained and recovered. Most of the items in an emergency response kit, such as boom sections,

*(continued on page 48)*



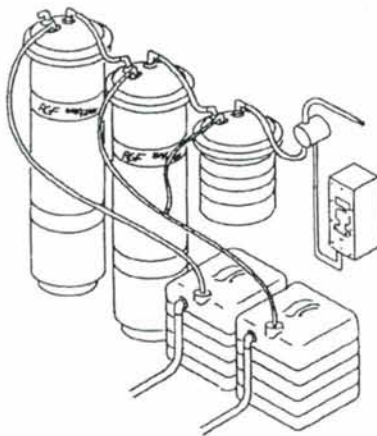
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**EPA MAKES WAVES** *begins on page 30*

are relatively inexpensive. Other items such as oil water separators and skimmers cost more. Where several marinas are located in reasonably close proximity it may be possible to develop a joint plan and share the equipment to minimize the overall cost and still have adequate hardware on hand.

Another area to be considered by the marina operator is his fuel storage tanks. If he has underground storage tanks (UST) he may have to replace these tanks with new non corrosive fiberglass tanks or double walled steel tanks. Leakage monitoring will also likely be required. Above ground tanks pose other types of problems. This is an area the marina operator may wish to consult with local authorities on to get proper guidance.

Contact **Ronald G. Fink**, President, RGF, Inc., 3875 Fiscal Ct., Ste. 200, West Palm Beach, FL 33404.

**RGF ENVIRONMENTAL SYSTEMS, INC.**

3875 Fiscal Court

West Palm Beach, FL 33404

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## LEGISLATION

# New IMO rules are on the way

New amendments to SOLAS, MARPOL and other conventions mean shipowners face significant regulatory changes

**D**ESPITE accusations of foot-dragging and bureaucratic inertia, IMO (the International Maritime Organization) has, over the last few years, disgorged a large number of new shipping safety and anti-pollution regulations. Of equal, if not greater, significance, IMO has also taken long-overdue steps to speed up its implementation procedures and those of its member states. The system of tacit acceptance, heavily encouraged under the leadership of Secretary-General Bill O'Neil, has already played a major role in accelerating the implementation process. Basically, "tacit acceptance" means that countries that are signatories to a convention will automatically be bound by any changes in that convention unless they specifically opt out.

Over the next 18 months to two years, the tacit acceptance mechanism promises to usher in a large number of amendments to two of IMO's most important conventions, those dealing with safety of life at sea (SOLAS) and prevention of pollution from ships (MARPOL). Coupled with changes to the conventions covering training, certification and watchkeeping; container safety; tonnage measurement and maritime traffic facilitation, these amendments will mean that shipowners will have to comply with a steady if unspectacular stream of new regulations, as flag and port states implement the convention requirements through their own national legislation.

This year has already seen the entry into force of the May 1991 amendments to SOLAS. Broadly, these cover the stowage, securing and carriage of grain and other cargoes. And, under amendments adopted in spring 1992, measures to improve the damage stability of RO/RO passenger ships will begin to take effect from October 1 this year. The beginning of October marks the start of an 11-year phase-in period for amendments to

the damage stability regulations that took effect on April 29, 1990. The October deadline applies to vessels that achieve only 70% of the modified SOLAS 90 standard. Vessels whose degree of compliance is between 70% and 75% will have until October 1, 1996 to meet the new requirements. Ships achieving between 75% and 95% of the new standard will have from October 1, 1998 to October 1, 2005 to comply.

A similar phase-in period is expected for the requirements for improved fire safety for existing passenger ships that are contained in the spring 1992 amendments. The improvements include mandatory requirements for

smoke detection and alarm and sprinkler systems in accommodation and service spaces, stairway enclosures and corridors. Emergency lighting, general emergency alarm systems and other means of communication are among other fire safety measures that are required.

### GRANDFATHER CLAUSES

Though the damage stability and fire safety measures will involve expensive modifications to most affected ships, IMO has eschewed its policy of exempting existing vessels through "grandfather clauses." There is little doubt that the horrific Herald of Free Enterprise and Scandinavian Star accidents prompted this deviation from IMO precedent.

In contrast, the December 1992 amendments to SOLAS do follow the tradition of restricting new legislation to new ships. Concerned chiefly with construction requirements for new tankers and fire safety standards for new passenger ships built on or after October 1, 1994, the new amendments enter force on that date under the convention's tacit acceptance provisions.

The main changes affecting new tankers concern access to cargo spaces and communications between

### IMO CONVENTIONS Status at April 1994

Title	Year of Adoption	Requirements for entry into force	Entry into force
<b>SOLAS</b>			
Protocol amendments	May 1992	Ships on date after entry into force of 1988 SOLAS and its protocols	Oct 1 1994
Protocol amendments	Dec 1992	Same as above	Oct 1 1994
Protocol amendments	Dec 1992 (IBC code)	Same as above	Oct 1 1994
Protocol amendments	Dec 1992 (NSC code)	Same as above	Oct 1 1994
<b>MARPOL</b>			
Amendment	1992 (IBC)	Tacit acceptance	1994
Amendment	1992 (BCH)	Tacit acceptance	1994
Amendment	1992 (Annex I)	Tacit acceptance	1994
<b>FAL</b>			
Amendment Annex	1988	Tacit acceptance	Sept 1 1994
<b>CSG</b>			
Amendment	1993	Tacit acceptance	Nov 1 1995
<b>TONNAGE</b>			
	1982	Adopted on by 25 states (more than 65% of world tonnage of merchant ships)	Oct 18 1994

\*Some exemptions to the tonnage measurement convention are scheduled to expire on this date.

by Neil Sinclair







ridge and engine room.

The new passenger ship fire safety standards are wider ranging. They embrace fire extinguishing equipment, fire detection and alarm systems, fire doors, fire integrity of bulkheads and decks, and passenger escape routes. Most of these new regulations apply only to ships carrying more than 36 passengers.

#### IBC AND IGC

Shipowners have only until July 1 this year to come into compliance with two amended codes that are mandatory under both SOLAS and MARPOL. These are the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (the IBC code) and the International Code for the Construction and Equipment of Ships Carrying Liquid Gases in Bulk (the IGC code). Both apply to ships built after 1986 under the SOLAS convention.

The most important changes to the IBC code cover the list of chemicals excluded from the code (chapter 18), cargo tank venting and gas freeing arrangements (chapter 18) and the summary of minimum requirements (chapter 17). Most of the significant amendments made to the IGC code are intended to reflect the technical changes introduced since it was adopted in 1983.

Closely related to both the IBC and IGC codes is the MARPOL code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH). Applicable to ships built before 1986, amendments adopted in 1992 will enter force on July 1 this year under the tacit acceptance provisions. Many of these amendments are simply intended to keep it in line with the IBC code. They include a new chapter VIII dealing with the transport of liquid waste and a new summary of minimum requirements (chapter VI).

Other MARPOL changes effective this year are the 1992 Annex II and Annex III amendments. Under Annex III rules have been updated that govern pollution by hazardous and noxious substances carried in package form. Also covered are provisions for packing, marking, documentation and stowage. Annex II will enter force on July 1, some four months after Annex III's taking effect. It covers pollution by noxious liquid substances in bulk and makes the Antarctic a special area.

#### OPA SENDS A WORRYING MESSAGE

The wide publicity invariably accorded pollution incidents and seri-

ous loss of life at sea has helped O'Neil to prod IMO into a higher gear. Undoubtedly, too, U.S. unilateral action in implementing OPA '90 has sent a worrying message to the international maritime regulatory community. But there are still plenty of examples of a lethargic pace of legislation implementation. Not all can be blamed on IMO bureaucracy. Indeed, when it comes to procrastination—particularly if action costs money—the international shipping industry can be more than a match for IMO. The International Tonnage Measurement Convention (ITMC) is a prime example. Adopted way back in 1969, the ITMC applied to new ships built after July 18, 1982. Existing ships were given a 12 year grace period that expires on July 18 this year. Despite this relatively generous exemption, and its imminent expiry, IMO reports that there is still a "huge number" of ships which have yet to be remeasured. Privately, IMO sources believe that it is impossible for all affected ships to meet the July deadline. The classification societies and other bodies able to issue tonnage measurement certificates simply don't have the time or resources to handle the number of ships still requiring remeasurement.

Shipowners may have been slow to get their vessels remeasured, but they've been pretty quick off the mark when it comes to lobbying IMO for a further period of grace. All the indications from IMO's Albert Bank, London, headquarters are that there will be further concessions—particularly to "paragraph" ships. These are ships so-called because they are affected by the regulations of various countries that have separate sections, or paragraphs, for ships of different gross tonnages. Built to the maximum gross tonnage under given paragraphs, these ships will face more stringent requirements, and higher running costs, under the new measurement rules.

Far less controversial than the ITMC are amendments to the International Convention for Safe Containers (CSC) which enter into force in November 1995 and amendments to the Convention on the Facilitation of International Maritime Traffic (FAL) that enter force on September 1 this year.

#### BIG CHANGES TO STCW

Looming on the horizon are major changes to the landmark convention on Standards of Training, Certification and Watchkeeping (STCW). Although STCW was adopted in 1978 and came into force a decade ago, many of its provisions are still only advisory. A fundamental rewrite is now in

progress that promises to make many key STCW rules mandatory. In addition to getting more teeth, the convention will also be thoroughly revised in the light of the widespread use of modern technology—particularly the adoption of simulators for navigation and other training.

IMO hopes that the final text of a revised STCW convention will be agreed at its training committee's December 1994 meeting. If this can be achieved and the revised STCW

placed on the fast track of tacit acceptance, it could enter into force in 1977.

#### HERE COMES ISM

A little higher on the safety legislation agenda is the International Safety Management (ISM) Code. Adopted unanimously at the IMO Assembly last year, the ISM code is currently a recommendation. But IMO intends to give it mandatory status by adding it to SOLAS as a new chapter. The ISM amendment to



SOLAS will be one of the first things to be considered at next month's meeting in London of the IMO Maritime Safety Committee (MSC).

Also likely to be adopted next month are procedures to enable port state control officials to assess the ability of ships' crews to carry out their duties.

Further SOLAS rule changes and new regulations just over the horizon embrace mandatory ship reporting, enhanced inspections of oil

tankers and bulk carriers, and high speed craft.

A draft regulation will make a ship reporting system mandatory for use by all ships, or certain classes of ships, when adopted and implemented in accordance with IMO guidelines and criteria. These have yet to be fully developed by IMO, but are expected to be adopted by the 19th assembly in 1995. The effect will be to make it obligatory for ships entering or using a system to give their posi-

tion, identity and other information.

The enhanced survey program for oil tankers and bulkers is aimed at improving the safety of vessels of five years old and over, beginning in 1995. Adopted by IMO last November, the tougher inspection rules pay particular attention to corrosion. They reflect increasing concern at the aging of the world merchant fleet and the disturbingly high number of casualties to bulkers in recent years.

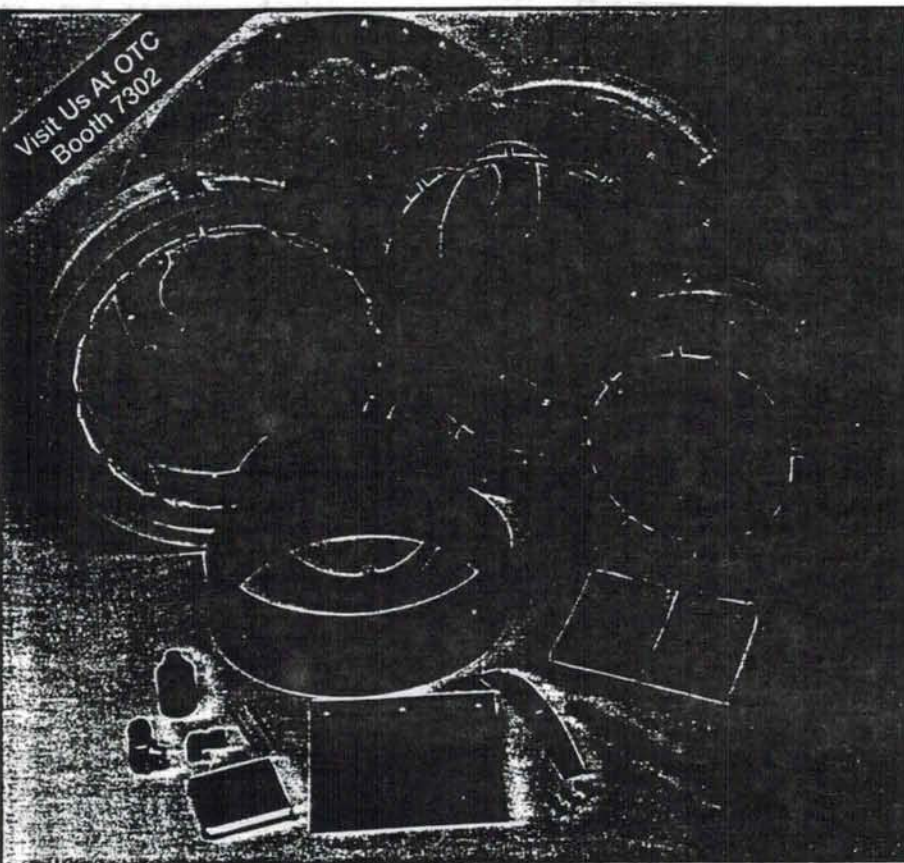
#### HIGH SPEED CRAFT

In proposing the addition of a new SOLAS chapter on high speed craft, IMO has—perhaps somewhat belatedly—recognized the special needs of these vessels. The high speed craft code (HSC) will apply to high speed craft on international voyages that do not proceed for more than four hours at operational velocity from a place of refuge when fully laden. It will also cover cargo craft of 500 gross tons and above which do not go more than eight hours from a port of refuge.

The draft HSC code, which is intended to include air cushion vessels (such as hovercraft) and hydrofoils, aims to ensure levels of safety that are equivalent to those contained in SOLAS and the 1966 International Convention on Load Lines.

Other SOLAS amendments under consideration for the next few years include changes to Chapter II-2, Chapter III and Chapter V and to the IGC and IBC codes.

These and other amendments are likely to enter into force considerably more rapidly than in the past. At the



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#### IMO'S O'NEIL: Trying to put international regulation on the fast track

moment, the SOLAS convention decrees that proposed amendments must be circulated for at least six months before adoption. It also says that they will enter into force a minimum of 18 months after adoption. However, O'Neil has asked the Maritime Safety Committee to consider a proposal to reduce these periods to three and 12 months respectively. **ML**

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## DNV creates <sup>ORV</sup> comfort evaluation standards

**D**ET Norske Veritas has developed an evaluation system for comfort on board passenger vessels and merchant ships. The DNV Comfort Evaluation consists of the Comfort Class notation and an advisory service dealing with seasick-

ness, called the Sea Comfort Index.

Comfort Class rules set standards for acceptable levels of noise, vibration and indoor temperature, humidity and fresh air supply. These standards also determine how the measurements are to be execut-

ed and evaluated, ensuring that an equivalent standard is maintained.

Ships are rated on a scale of 1 to 3 with 1 meaning "excellent comfort" and "acceptable comfort."

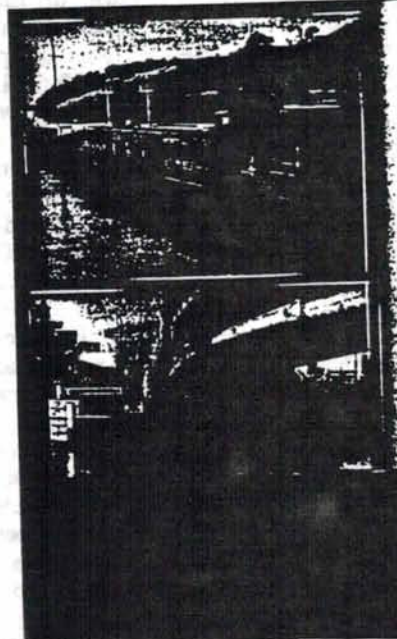
The standards differ slightly in public spaces and on board merchant ships and high-speed light craft.

DNV considers that only a few of the newest and most modern existing passenger vessels will comply with Comfort Class 1 and just a small number of existing ferries will meet the requirements of Comfort Class 3.

Sea Comfort ratings are currently offered as an advisory service but will eventually become part of the Comfort Class. The index is expressed as a number in the range 0 to 1, where 1 defines highest comfort with little or no risk of passengers being seasick. Variables which are rated are wave environment, vessel speed, vertical acceleration and exposure time.

### FOR THE RECORD ...

In our February article on quality assurance in ship management, the Det Norske Veritas system for Safety and Quality Management for Safe Ship Operation and Pollution Prevention should have been referred to as the DNV SEP system.



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## Solving COFR problem will be expensive

**A**T press time, it looked as though the Coast Guard was very near to issuing an interim final rule on the COFRs (certificates of financial responsibility) required by OPA '90. The proposed rules initially issued by the Coast Guard caused considerable concern to the P&I clubs. The clubs made it clear that they simply were not prepared to become "guarantors" as mandated by OPA. What they found most objectionable in the proposal was that, in their view, it exposed them to unlimited liability, stripped them of the normal legal defenses written into any insurance contracts and exposed them to direct legal action by pollution claimants.

Sources tell us that the clubs won't find much comfort in the interim final rule. It will be very similar to the original

proposal. It may, however, stretch out the implementation date so that the Coast Guard can continue to accept, for a time, COFRs issued under pre-OPA rules and backed by existing P&I policies' pollution cover.

### COMMERCIAL OPA COVER: AVAILABLE, BUT EXPENSIVE

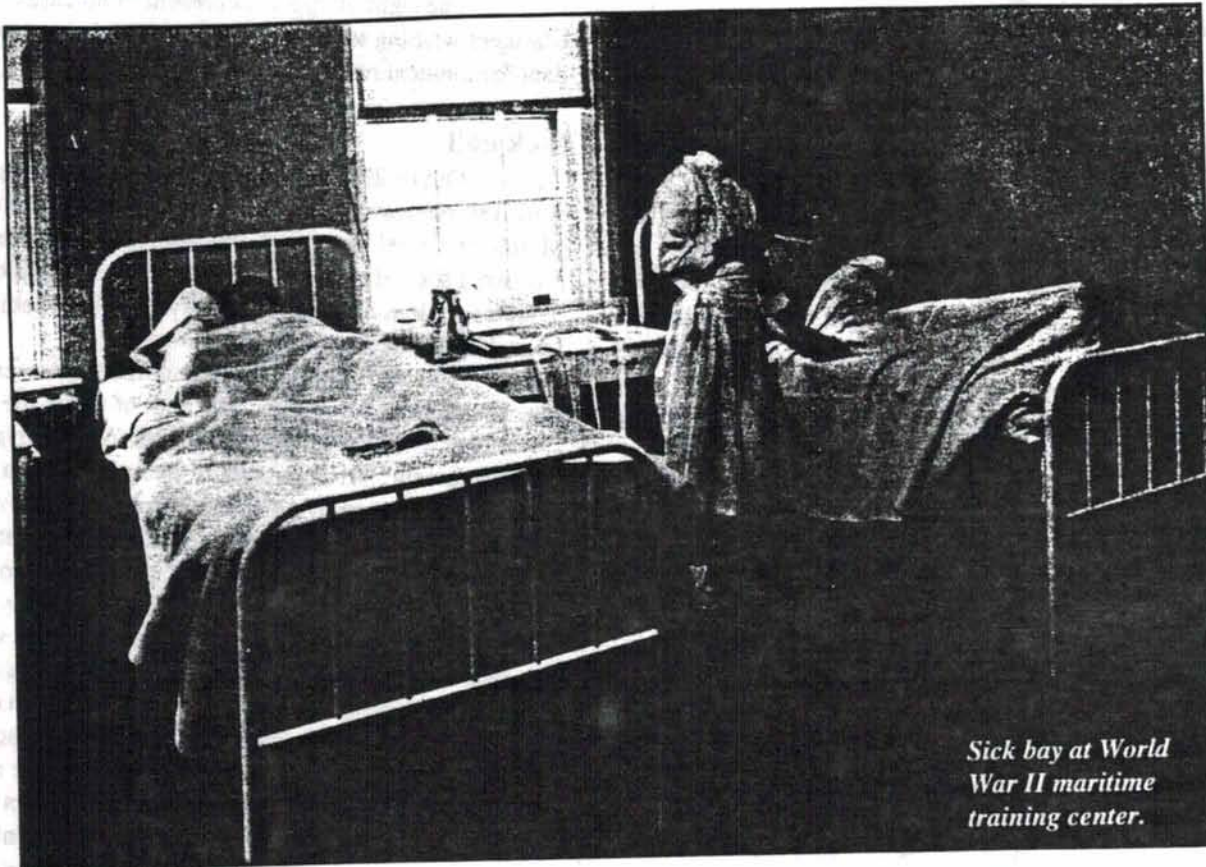
The most significant development is that at least two groups are proposing to offer OPA '90 pollution insurance on a commercial basis. It is understood that those proposing to offer this cover have been in discussions with the Coast Guard to ensure that the policies meet the requirements of OPA.

The problem for shipowners—including non-tanker owners, of course—is that, because of the high cost of reinsurance, this commercial

pollution insurance will be very expensive. And those offering it are not doing so as an act of charity. It could thus add substantially to the costs of moving goods of all sorts to and from the U.S.

Meanwhile, shipowners should not expect too much relief from the possibility that the Coast Guard will extend its recognition of existing COFRs for some time. Word from sources in London is that the leading clubs could well decide simply to drop pollution coverage for ships trading in U.S. waters. The term being used in conversations over the claret in P&I lunching spots is "economic meltdown." That refers to the likely consequences of the withdrawal of cover. Should the clubs end U.S. pollution cover, they will likely cite their very real concerns over natural resource damage valuation as the principle reason.





*Sick bay at World War II maritime training center.*

## *Taking a close look at physical standards*

*Will my diabetes keep me from being able to renew  
my masters license this year?*

*The answer is, "No — not if you don't want it to."*

*By LT Cyndi Stowe*

New and old merchant mariners alike are learning that the Coast Guard looks at their physical status before issuing or renewing their licenses or documents. Your doctor's recommendation is taken into consideration as well as your medical condition, the medications prescribed, your control over the condition and your ability to function safely in the capacity of the license or merchant mariner's document for which you have applied.

The licensed mariner is, by far, the most essential element in a safe marine environment. It is the responsibility of the Coast Guard to ensure that mariners

are qualified in all respects. They must not only have the necessary knowledge and skills, but they must be physically capable of performing their duties in a reliable manner. When considering a mariner's physical condition, the Coast Guard's objective is to verify that the individual is able to stand an alert watch without being subject to a sudden onset of an incapacitating condition. The individual must also be capable of functioning in an emergency and not be a risk to passengers or fellow crew members. These standards apply to mariners in inland as well as in ocean service.

*Continued on page 8*



## Applicable rules

Federal regulations require that all new and renewal license applicants, and unlicensed seamen applying for qualified ratings must have physical examinations. The exam must document a mariner's visual acuity, color sense and general physical condition. (The only physical standards specified by the regulations are visual acuity and color sense.)

Regional examination centers screen physicals using Navigation and Vessel Inspection Circular (NVIC) No. 6-89, "Physical Evaluation Guidelines for Merchant Mariner's Documents and Licenses," published by the Coast Guard in 1989. These guidelines list medical conditions that may be disqualifying.

The guidelines, however, are just that - guidelines. They are not intended to be absolute or all encompassing. Some mariners may have a condition not on the list which would render them unable to perform their duties aboard a vessel. Others might be very capable of working at sea without posing any risk to passengers, shipmates or the ship, even though they have a listed condition.

If an applicant has a condition which might be disqualifying, the officer in charge of marine inspection can refer the case to Coast Guard headquarters where a physician can make a medical evaluation. The doctor can determine whether the applicant meets the established standard and, if not, recommend whether a medical waiver is appropriate or not.

## Medical waivers

Waivers are considered on a case-by-case basis and are essentially based on performance. Can the applicant reliably perform the duties associated with the license or qualified rating? There are several aspects to consider:

- A) the ability to perform routine duties;
- B) the susceptibility to sudden onset of an incapacitating condition; and
- C) the ability to respond to emergency conditions.

A good example of performance-based standards is the evaluation method used for applicants with paralysis, missing limbs or extreme obesity. They demonstrate their ability to perform necessary routine and emergency tasks before an evaluator under as realistic conditions as possible, usually underway.

In some cases, the applicants can perform the tasks unassisted. In others, special vessel arrangements or modifications may be necessary. An applicant's license or document may be limited to a particular vessel where the necessary modifications have been made.

Within the last several years, the commandant has delegated additional responsibility to the officer in charge of marine inspection to issue waivers for visual acuity and hearing, which are within certain parameters.

Other cases that the officer in charge feels should be considered for a waiver are referred to Coast Guard headquarters for consideration.

The right of appeal is present in all cases. Mariners wishing to appeal their cases to the commandant for medical review may do so.

## Sick call

Out of 23,000 licenses issued in 1993, there were 184 requests for physical waivers referred to the Merchant Vessel Personnel Division. These waivers requested special consideration for cardiac conditions, diabetes, vision, hearing, use of psychotropic medications, hypertension and seizure disorders.

The two most common conditions were cardiac problems and diabetes. For both of these, the Coast Guard will request specific tests for the physicians to review. In 85 percent of the cases of both conditions, the mariners were able to document good control over them and waivers were granted. In the other 15 percent, the Coast Guard identified poor control which could lead to the inability to function safely in the marine environment, presenting a risk for the vessel. These individuals were given the opportunity to gain better control of their conditions, usually through diet and exercise, and then submit their applications again.

These conclusions were drawn from the number of waiver requests by license type. Operators of uninspected towing vessels account for 30 percent of all waiver requests, although they only account for eight percent of the total licenses issued. Operators of uninspected passenger vessels take a close second.

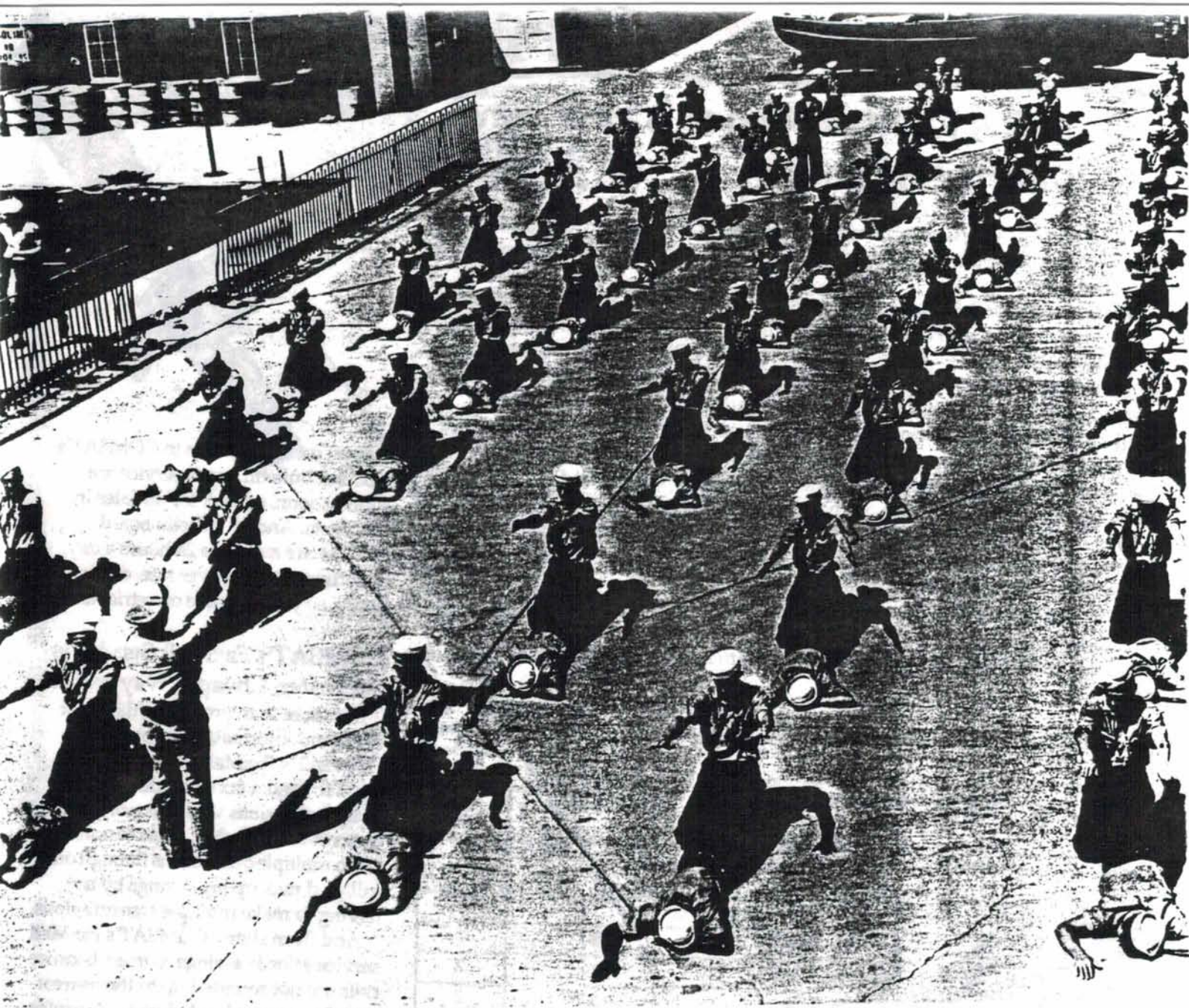
## Policy changes

Numerous appeals have prompted a closer look at visual acuity standards. In these appeals, the mariners' corrected vision met the standard in the regulations although their uncorrected vision was below the 20/400 limit for Coast Guard waivers. In the past, these appeals were denied based on concerns about how well a person with uncorrected vision below 20/400 could function if his or her glasses were broken or lost.

In certain circumstances, the Coast Guard will issue waivers to individuals with uncorrected eyesight below 20/400 if their corrected vision is satisfactory. (The Navy has granted waivers to personnel with uncorrected vision up to 20/800.) Such individuals will be required to wear sports-type unbreakable glasses with a fixed restraining strap. All individuals with vision waivers must carry spare glasses on the vessel.

In the past, the Coast Guard regarded conditions that were treated with psychotropic medications as disqualifying. However, there has been an increase in the number of mariners who are prescribed such medications for mild cases of anxiety or depression. These individuals have documentation from attending physicians and psychologists strongly recommending them





*Mariners are trained in artificial respiration during World War II.*

for continued employment on the basis of their ability to function safely with or without medication. The Coast Guard is taking a fresh look at these individuals case-by-case.

### **Advice**

The best advice is to "take care of yourself." The majority of medical problems dealt with by the Coast Guard come about over a long period of time. Early action on your part may slow or reverse their development.

Get your employer involved. Look closely at your diet and exercise. Start a medical monitoring program to identify potential problems early and make the necessary life—style changes now, before your career and health are in jeopardy.

If you are in doubt about your physical condition, start the renewal process early. You may apply up to one year before your license expires.

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*Photographs accompanying this article are of merchant marines at a training center on Hoffman Island, New York, during World War II.*

*LT Cyndi Stowe is a staff member of the Licensing and Evaluation Branch of the Merchant Vessel Personnel Division.*

*Telephone: (202) 267-6828.*



# COMSAT's FaxMail Service is Your News and Information Source

In COMSAT Mobile Communications' continuing efforts to provide a broad and diverse range of FaxMail bulletin boards to users, three all-new bulletin boards are now available:

**Seaman's Choice:** Provided by Walport Ltd., SEAMAN'S CHOICE is a monthly movie bulletin board offering videos to mariners at special prices. Mariners can order the videos listed in SEAMAN'S CHOICE via COMSAT and receive their videos when they arrive at their next port. Users can access this bulletin board by using FaxMail service code \*49. And there's no surcharge for access, either.

**Port of Philadelphia Information Bulletin Board:** This bulletin board provides information such as the vessels in port, vessels at anchorage, the weather for Delaware River ports, and the tides. The FaxMail service code used to activate this service is \*33. Again, there's no surcharge for this bulletin board.

**Globo Brazil News (Portuguese):** Globo News contains a two-page fax news update with Brazilian economic, political, sports and cultural news. Information in this bulletin board is the same as that appearing in O Globo.

Additional bulletin boards, providing the latest news updates and sports information in the appropriate language, from the U.S., Britain, Germany, France, Latin America, Norway, Italy, and the Pacific Basin are available from COMSAT and listed below:

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COMSAT MARIPRESS	U.S. and Int'l News in English (on weekdays)	\$5	2
COMSAT MARISPORTS	U.S and Int'l Sports (on weekdays)	\$5	
INSTANT!News	U.S. News (on weekends)	\$7*	2
INSTANT!News	British News	\$7*	2
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INSTANT!News	Japan News	\$7*	1
INSTANT!News	Italy News	\$7*	2
Pacific Ice Flow		\$20	1
Fish Forecasting		By subscription	2-3

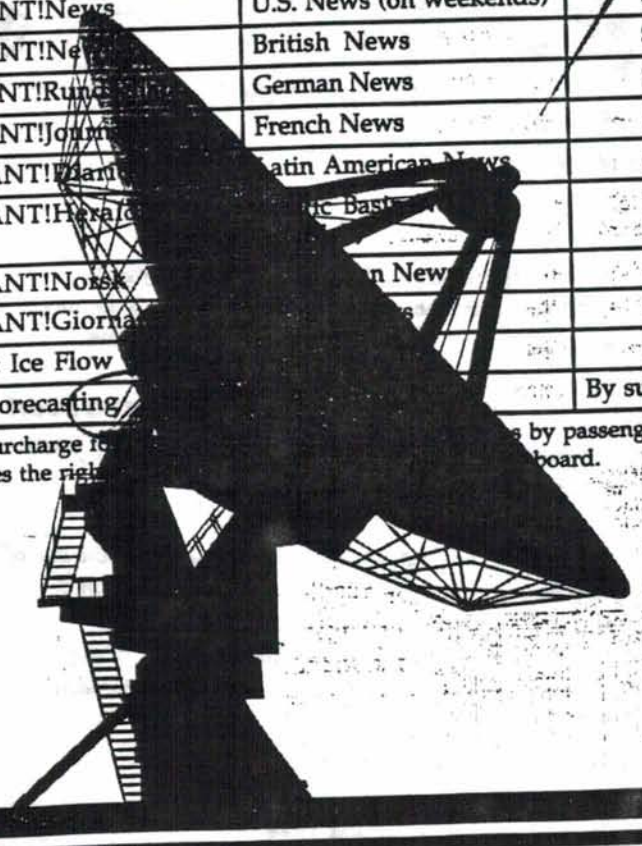
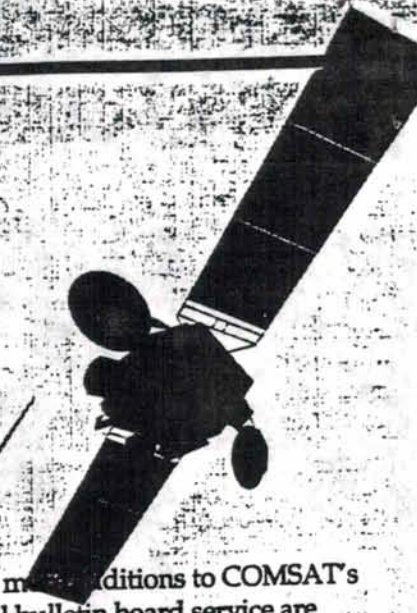
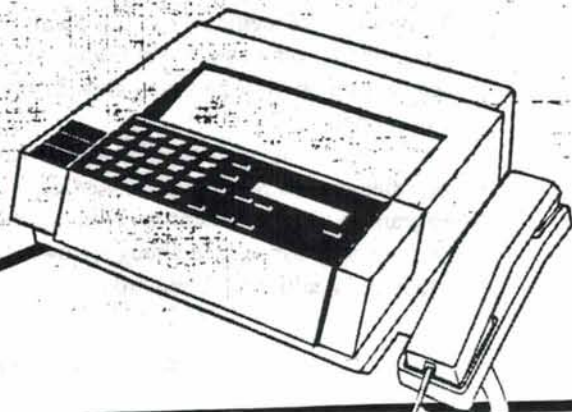
\*The surcharge for service by passenger vessels is \$23.00 and includes the right to use the bulletin board.

Even more additions to COMSAT's FaxMail bulletin board service are coming soon, so look for updates in Marifacts. And all bulletin board services are available 24 hours a day, including during lower rate, off-peak hours, so you can save on retrieval.

## COMSAT's FaxMail Service is the Faster, Cheaper Way to Fax

But more than providing the latest news and information to mariners, COMSAT's FaxMail service enables users to send a fax to single and multiple destinations with just one simple operation. From ship, users can send a fax to multiple destinations through one call, and rack up big savings by not having to make multiple transmissions. And from shore, COMSAT's FaxMail service affords savings to users because calls are not rounded up to the nearest minute, as most local phone companies do, which bill in total minutes only. But not COMSAT. Other FaxMail features include mailbox capabilities to send faxes during off-peak times, one-stop billing, and automatic retry.

For a complete kit detailing COMSAT's entire FaxMail service—and the savings it makes available to you—contact the Marifacts Editor. ■

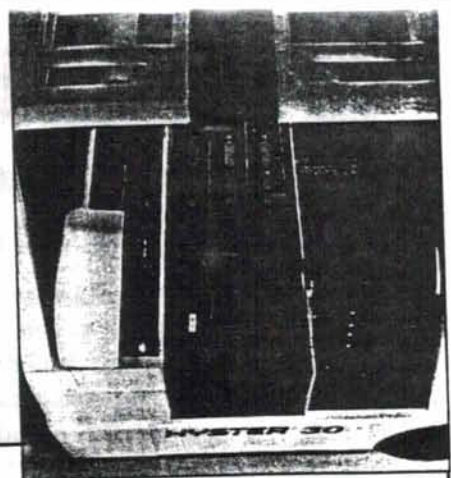




# Forklift batteries

## A guide to safe handling

A systematic and regular approach to forklift battery handling and maintenance reduces the potential for accidents, as well as increases battery life. Use this checklist for battery charging, handling and maintenance.



The swing-back fiberglass cover on this Hyster J30XM electric forklift provides full battery access.

### Battery charging

- Wear rubber apron, gloves, boots and face masks when handling, checking, filling, charging or repairing batteries.
- Always have fresh water available in case electrolyte is splashed on skin, clothing or eyes. If electrolyte is splashed into eyes, flush with water and call a doctor immediately.
- Lift batteries with mechanical equipment, such as a hoist, crane or lift truck with an insulated spreader bar. Move batteries horizontally with power trucks, conveyors or rollers. Safety shoes and hard hats are recommended. Metallic safety hats should be avoided.
- If acid is spilled on the floor, brush on a neutralizing solution, such as a mixture of one pound baking soda to one gallon water.

- The battery charging area should be restricted, with adequate ventilation and no smoking signs posted. Never use sulfuric acid solutions of over 1.400 specific gravity.
- Keep a type A.B.C. fire extinguisher on hand.

### Battery maintenance

- Check electrolyte level and specific gravity in different cells daily. Add approved water to each cell as often as necessary to maintain level above the separator protector and not higher than the covering ring. Do not overfill.
- Keep top of battery clean and dry. Monthly, clean and neutralize the top of the battery with a weak baking soda solution (50 grams per liter of warm water), followed by a water rinse. Ensure vent caps are firmly in place at all times.
- Keep a daily maintenance record of each battery. Protect your warranty.
- Give an equalizing charge at least once per month.

### Battery operation

- Specific gravity of a fully charged battery should read 1.280 to 1.300 per cell at 77°F. This can vary according to manufacturers.
- Never discharge a battery lower than 1.150 specific gravity at 77°F. Operation below 1.150 will shorten battery life.
- Never leave a battery in a discharged position.
- Never allow battery temperature to exceed approximately 115°F. If necessary, cease operation and allow battery to cool.
- Ensure that charger is in proper operating condition. Consult charger operating manual.

### Safe handling

- Never lay metal tools on top of a battery.
- Keep open flames and spark-producing sources away from storage batteries.
- Keep vent plugs in the cells at all times, except when taking hydrometer readers, adjusting specific gravity and electrolyte levels, or trouble-shooting or reassembling a repaired cell.
- Check batteries for acid leakage or signs of corrosion.
- When storing batteries that will not be in use for prolonged periods, keep in a cool, ventilated area, and give the battery a boost charge at least once per month. ■

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F.T.T. Limited, Scarborough, Ontario, Canada, provided the information for this checklist.

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## Overhead and underestimated

*Video stresses planned, careful operation of overhead cranes*

Overhead cranes are the Rodney Dangerfield of the industry—they get little respect because operations are repetitious and often routine. When accidents do occur, however, the results can be disastrous. The loads are big and there are always people around. Fighting complacency is perhaps the biggest challenge for supervisors. A new video from the Crane Institute of America, Inc., Maitland, Fla., called "Overhead Crane Safety," reviews the fundamentals of safe overhead crane operations.

This video warns that overhead crane operational hazards most definitely exist. If the crane drops the load, for example, or causes the load to collide with other objects or other workers, serious damage and injuries will occur. The first step to preventing such disasters is to make sure all operators are sufficiently qualified. Qualification criteria for different tasks vary; operators of pendant-operated overhead cranes are only required to pass a practical exam, for example, while operators of cab-operated overhead cranes must pass physical, written and practical exams. It is the responsibility of the supervisor to ensure all operators have received proper training and pass the required tests.

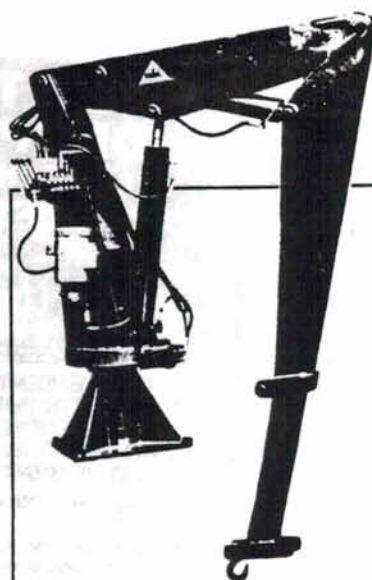
Properly functioning equipment also is crucial to safe

operations. Daily pre-operational inspections verify that the crane is in safe operating condition, and that deficient parts are repaired or replaced before work begins. All repairs must be approved by a qualified person before operations resume. Periodic inspections are more thorough, and should be conducted and documented by a certifier. The certifier identifies hazardous conditions and determines if disassembly of the equipment is warranted for further inspection.

Since dropping the load poses the most obvious threat, the video cautions that attention be paid to attaching and moving loads. The load sling or lifting device must be secured in the bowl of the hook; the load should then be lifted a few inches to check balance and positioning. To minimize swinging, the hook should be brought directly over the load, and the load lifted cautiously. The operator is warned to ensure nothing blocks the path of the load.

This video also discusses side pulling, lifting a load using two or more cranes, and commonly used hand signals. It has a running time of approximately 18 minutes.

To purchase "Overhead Crane Safety," call Crane Institute of America, Inc., at 800-832-2726.



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# Secure Setups

Video focuses on establishing safe mobile crane conditions

**R**equirements for mobile crane setup depend on the type of crane, the site location and the lifts to be made. How these factors are related and how they affect the lift are important things for operators and supervisors to understand, and are issues discussed in a new video from Crane Institute of America, Inc., called "Setup for Safety."

It is important that the ground be graded, level and compact, according to the video. Outrigger pads, designed to support the weight of the crane and the load under ideal ground conditions, may need to be supplemented with blocking or mats in more realistic settings to distribute the ground bearing pressure over a larger area. This video provides viewers an animated depiction of how the pressure of the crane and its load is absorbed by the outrigger floats, and how blocking and mats relieve some of the ground bearing pressure.

The video stresses that blocking must be rigid, tightly spaced and a minimum of three times larger than the float area of the outrigger. Blocking must be level and set square to the cylinder. The video explains that if more than one layer of blocking is required, it must cover an even greater

area than the single-layer blocking to avoid creating an unstable condition.

Timber mats also can supplement ground stability for crawler cranes. When properly constructed and bolted together, these mats ensure that the weight is distributed across all the timbers.

In addition to solid ground, the crane requires sufficient space to rotate, lift and boom out. To provide for this, operators and supervisors must see that the work area is clear. A rope or barricade should be set up around the crane and the area representing the swing radius of the counterweight. Account for at least two feet of clearance between the swing radius of the counterweight and any other objects, so a person can't get caught between them. Also, allow for the minimum distance between any part of the crane and overhead power lines.

"Setup for Safety" addresses several other issues regarding crane setup, including assembly and disassembly of lattice booms and leveling the crane. The video has a running time of 18 minutes.

To purchase "Setup for Safety," call Crane Institute of America, Inc., at 800-832-2726. ■

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## Grappling with gravity

*Adjustable chain slings help riggers cope with daily dilemmas*

In a perfect world, every load would have a center of gravity that was actually in the center. You would always have the ideal amount of head room, and it would be a breeze to maintain a 60° sling angle.

Here on planet earth, however, riggers have to lift irregular loads with offset centers of gravity. They must re-rig loads to accommodate low ceilings and less than ideal sling angles. Fortunately, in many applications, riggers can use adjustable chain slings to deal with such problems and make their jobs easier.

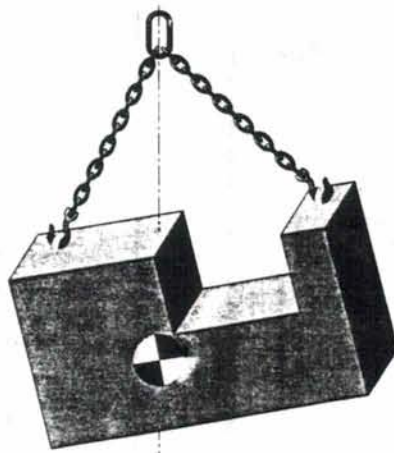
Adjustable chain slings incorporate a second hook, called a grab hook, attached

are available as well, providing a variety of possible hitch types. For example, the endless chain leg can be looped around the load and secured in the grab hook to form a basket hitch.

Some slings are welded to meet exact specifications for a given application—ideal for companies that perform the same types of lift on a regular basis—but they cannot be altered or repaired at the job site. For more general needs, mechanical adjustable slings are even more flexible. These are joined with removable pins, and lengths of chain can be replaced on site.

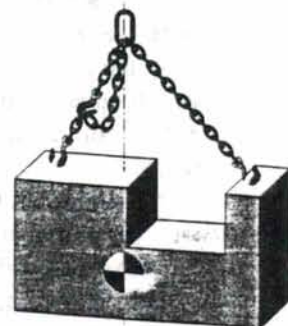
### Real-life applications

Riggers must always be aware of the center of gravity of a load in relation to the lifting points and the effect this has on the tension imposed on each leg of the sling. In figure C, for example, where slings with legs of equal lengths are used, the center of gravity is not in line with the point of the lift. This means that when the load is lifted, it will tilt until the center of gravity is below the crane hook. If adjustable chain slings are used, however, the leg over the heavier end of the load can easily be shortened as necessary. (See figure D.)



**Figure C:** If the center of gravity is not the physical center of the load, and slings with legs of equal lengths are used, the load will tilt until the center of gravity is below the crane hook.

**Figure D:** Adjustable slings shorten the leg over the heavier end of the load in order to balance it.



Adjustable slings are also helpful when you have an inappropriately small sling angle, or when you encounter a head height that is lower than anticipated. Say you've picked a load and are moving it when you come to an area where the ceiling is too low for the sling you've rigged. Rather than having to re-rig the load, with adjustable chain slings you can simply shorten the sling legs to achieve the appropriate head room. Again, bear in mind that slings lose capacity and tension increases as the sling's horizontal angle becomes smaller. This measurement should never be less than 30°, and a 60° angle is ideal.

Adjustable chain slings can be used in conjunction with synthetic and wire rope slings, as well, as long as the lifting environment is appropriate for each, and as long as all slings and attaching hardware are within their rated capacities for the anticipated tension(s).

When riggers approach a job where an adjustable sling is needed, they must understand all chain sling properties and proper uses. Although chain slings are more resistant to abrasion, corrosion and high temperatures than other types of slings, remember that some loads require more gentle handling than a chain sling can provide. All chain slings must be protected from sharp edges by some form of blocking material. A wooden blocking system provides a sturdy, yet soft, porous and non-abrasive surface. Riggers should never shock load a chain sling, and never hook a load with a kinked or knotted chain sling. Also, chain slings must be inspected according to safety requirements. ■

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**Figures A and B:** Kuplex® II mechanical adjustable slings from Acco Chain & Lifting Products Division



to the master link either directly or by a short length of chain (see figures A and B), which allows the rigger to essentially shorten a sling leg that is too long for a particular lift. The rigger takes in a length of the leg and secures it to the grab hook by one of the chain links (see figure B), bringing the leg to the desired length. Grab hooks attached directly to the master link allow the chain to be adjusted to its shortest possible length, making them useful in operations with limited head room. Hooks separated by a short length of chain are generally easier to work with, however. Adjustable slings can be purchased in the form of singles, doubles, triples or quads attached to a master link to suit different lifting requirements. Adjustable single- and double-loop slings

Information for this article was provided by Acco Chain & Lifting Products Division, York, Pa.





# Newsletter

VOLUME 13, NUMBER 3

MARCH/APRIL 1994

**U.S. COAST GUARD ANNOUNCES GPS IOC AND  
ACCEPTANCE OF GPS RECEIVERS TO MEET COAST GUARD  
EQUIPMENT CARRIAGE REQUIREMENTS OF 33 CFR 164.41;  
CAUTIONS MARINERS ON SYSTEM ACCURACY; OUTLINES DGPS PLANS**

The January 1994 RTCM Newsletter advised that the Navstar Global Positioning System (GPS) had achieved its initial operational capability (IOC) as defined in the 1992 Federal Radionavigation Plan (FRP) jointly issued by DOD and DOT.

The U.S. Coast Guard (USCG) has now announced that a GPS receiver meets the requirements for carriage of electronic position fixing devices as prescribed under the U.S. Code of Federal Regulations, Title 33, Part 164, Section 164.41. (Cited as 33 CFR 164.41)

When GPS reaches full operational capability (FOC) there will be 24 operational, production model satellites (Block II or newer) operating in their assigned orbits in six orbital planes. IOC means that 24 GPS satellites (any model) are operating in their assigned orbits, are available for navigation, and provide the Standard Positioning Service (SPS) levels of service as defined in the FRP. Further, any planned disruption of the GPS in peacetime will be subject to a minimum 48-hour advance notice provided by the DOD to the USCG GPS Information Center (GPSIC). A disruption is defined as periods in which the GPS is not capable of providing Standard Positioning Service as defined in the FRP. Unplanned system outages resulting from system malfunctions or unscheduled maintenance will be announced by the GPSIC as they become known.

The SPS is the standard level of positioning, velocity, and timing accuracy that is available to any user on a continuous worldwide basis. The horizontal positioning accuracy of this service is 100 meters (2 distance root mean square (2drms), 95% probability) and 300 meters with 99.99% probability. The SPS is affected by a process called selective availability (SA), which degrades the basic accuracy of the SPS to the specified level through adjustment and encryption of some of the signals and data. The more accurate (21 meters (2drms) horizontal accuracy) Precise Positioning Service (PPS) will be limited to authorized U.S. and allied military users and to those civil users who can meet specified requirements related to U.S. national interest, security requirements and need. Unauthorized users will be denied access to PPS through encryption of the signals.  
(Article Continued On Pg 2)

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**USCG ANNOUNCES GPS IOC; CAUTIONS MARINERS**  
**(Continued From Page 1)**

The USCG notes concern with regard to civil use of GPS for civil navigation, including, in particular, a problem in meeting integrity requirements. (Integrity is defined as the ability of a system to provide timely warnings to users when the system should not be relied upon for navigation.) Under GPS system operating practices certain operating parameters are monitored in the satellite internally and when detected, provide notification to users within six seconds. Other failures detectable only by the system control segment, however, may take from 15 minutes to several hours before users are notified. This is considered unsatisfactory for many modes and phases of navigation and is particularly deficient for the harbor and harbor approach (HHA) phase of maritime navigation.

The USCG also notes concern that GPS receiver latitude and longitude position readouts to several decimal places may mislead the mariner to system accuracy. The mariner needs to be aware that the SPS 100 meter 2drms accuracy means he can be anywhere within a radius of 100 meters of the indicated position 95% of the time. It also means that 5% of the time the actual position could be greater than 100 meters from the indicated location. The USCG notes that the mariner must be constantly aware of this fact and navigate with due caution, using all means available, particularly in more restricted locations such as harbor and harbor approach areas.

In U.S. waters both the integrity and accuracy required for harbor and harbor approach (HHA) navigation will be provided through augmentation of the GPS SPS by a USCG Differential GPS (DGPS) service now being implemented. The DGPS system uses a local reference receiver to detect errors in the standard GPS signals and transmit corrections to the user over USCG marine radiobeacon transmissions. The USCG DGPS system will provide a position accurate within 10 meters, with 95% probability and will reduce the integrity check of satellites from hours to seconds. The USCG plans to implement DGPS for harbor and harbor approach areas of the continental U.S., Great Lakes, Puerto Rico and most of Hawaii and Alaska by 1996.

**U.S. COAST GUARD SEEKS DOMESTIC OR FOREIGN SOURCES TO PROVIDE  
ON-CALL MF AND HF MANUAL MORSE RADIOTELEGRAPHY SERVICES**

By Notice in the Commerce Business Daily (CBD) the U.S. Coast Guard (USCG) has issued a sources sought synopsis to identify a potential domestic or foreign source who can provide on-call high frequency and medium frequency morse code radiotelegraphy services to the Coast Guard in the U.S. maritime search and rescue region of responsibility.

Telegraph and telephone responses to the CBD announcement will not be honored; correspondence should be addressed to Commandant (G-ACS-1A/MC0), 2100 Second Street, S.W., Washington, D.C. 20593-0001, USA. For additional information contact J.D. Hersey, Jr, USCG Headquarters (TTM), Telephone: +1-202-267-1358; Telefax: +1-202-267-4106.