THE MARINE CHEMIST NEWS

DEVOTED TO THE DEVELOPMENT AND DISSEMINATION OF METHODS FOR EVALUATING AND ELIMINATING HEALTH AND FIRE HAZARDS IN THE MARINE INDUSTRY

OCTOBER, 2004

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THE CHAIRMAN'S NOTES - One of your Association's primary goals is to disseminate information to its members who can in turn provide information to their clients. For the past couple of years we have been in a transition from paper to the electronic mode and have probably not performed as well as you are accustomed. We recognize that and are taking action to make improvements.

The MCA website has been updated and will contain meeting information and a list of training topics well in advance of the seminars. There is also a special topics section added to the website. It will include information such as the data from the diesel-vapor monitoring project, general and theoretical information on the use of a PID, and other topics that are under consideration. We hope to see this section of the website evolve into a place where you and your clients can go for information. For those of you that prefer not to utilize a computer the newsletter has been re-activated. If you have any suggestions on how the website or newsletter can be improved, please contact your sectional representative.

Very importantly, OSHA's 1915 Subpart P was issued as a final rule on 9/15/04. Shipyards have 90 days to become compliant: Dec 14 is the deadline. It is strongly recommended that all chemists read the standard and inform their clients. There are several new requirements that will affect shipyards. Areas of interest include; the introduction of a written fire safety plan, a "35-foot rule" for assigning fire watches, new training and recordkeeping requirements for fire response personnel, new requirements for the handling of oxy-fuel hoses, and several others. The standard can be obtained from the OSHA website.

DIESEL EXPOSURE MONITORING PROJECT - Last year, volunteers of the MCA have collected monitoring data on a variety of vessels on a variety of processes that have a potential for exposure to diesel oil vapor. The MCA was asked to help communicate our findings to our industrial partners. During the data collection several interesting observations were made and several important questions generated. The data and questions were presented to marine chemists who attended our seminars this past year. For those of you who could not attend a summary follows.

Initial Openings - The concentration of diesel vapor during the initial opening of tanks was determined to be between 6 - 1350 ppm. A major factor is the location of the vessel and the ambient temperature. Obviously in cold winter months vapor concentrations will be depressed. Nevertheless, levels in excess of 1000 ppm were frequent in temperatures above 70 degrees when tested with a PID prior to ventilation being applied to the tank.

During tank cleaning - Diesel vapor during tank cleaning operations was determined to be between 40 - 1400 ppm (PID & vapor badges). Major factors include temperature, the type of cleaning performed and, most importantly the amount, type and location of ventilation used

during the operation. High-pressure washing appeared to create a higher concentration of vapors. Properly locating exhaust ventilation can significantly reduce vapor concentrations. Worst-case scenarios were identified in tanks that had only one means of access, limiting the ventilation.

After tank cleaning - The concentration of diesel vapor after tank cleaning was completed was between 6 – 321 ppm, with general tank conditions and the amount of ventilation apparently being major factors. Tanks with significant pitting and poor coating systems appeared to produce higher vapor concentrations. It is difficult to determine if the condition of the tank or inadequate ventilation was the primary cause for elevated readings because ventilation was not consistently applied.

At marine chemist certification - The concentration of diesel vapor at marine chemist certification was reported between 0 – 82 ppm, with the upper level posing a problem for chemists. In accordance with ACGIH, readings above 75 ppm (5 times the TLV) do not allow using an adjusted work schedules to permit unprotected entry, even for short periods of time. Any reading over 5 times the TLV requires respiratory protection (i.e., "Enter With Restrictions"). For the most part ventilated cleaned tanks contained less than the TLV of diesel vapor.

Questions:

What is the IDLH concentration for diesel vapor? If there is no published IDLH then 10% of the LEL as published by NIOSH should be used and is enforceable by OSHA. (This is reiterated in an OSHA letter of interpretation dated 10/11/95 and signed by John Miles.)

What monitoring equipment should be used to determine if an IDLH concentration exists? Using a conservative LEL value for diesel as 0.6%, 10% LEL equates to 600 ppm. Should this calculated value be considered IDLH? Should a combustible gas meter or a PID be used to determine IDLH? Collected data clearly shows a significant difference with the two monitoring devices. Combustible gas meters indicating 1% LEL and PID indicating 700 ppm for the same space have been recorded as a common occurrence. Are you at the IDLH? Research indicates (and instrument experts verify) that CGIs typically have an error of 4-10 times actual (low) when monitoring diesel vapor, and the error increases with the molecular weight of the hydrocarbon. This seriously underestimates the actual concentration of vapors. The PID incorporates a correction factor to produce a much more accurate reading. As safety professionals it is clearly prudent to utilize the more accurate monitoring device to determine if an IDLH condition exists.

How can cleaners enter an atmosphere containing 1000 ppm diesel vapor in the Maritime Industry? They can't without violating the standard. More ventilation and time are required to further evacuate the vapors to a concentration below 600 ppm (a calculated IDLH using LEL at 0.6% for diesel).

Can you wear a half face respirator in an atmosphere containing a concentration of diesel vapor greater than 15 ppm but less than 150 ppm? Because of the skin notation for diesel fuel exposure in the ACGIH handbook one could draw the conclusion that no exposed skin is permitted in atmospheres above 15 ppm. A half face respirator assigned a NIOSH protection factor of 10 times the 15 ppm TLV, or150 ppm, but does not provide facial protection. Does this mean we cannot use half face respirators?

Diesel has been assigned a "Skin" notation by ACGIH, indicating skin contact with the material poses a significant mode of exposure. MCA contacted ACGIH for a clarification of what the skin notation actually means: I.e., is it their intent to eliminate the use of half face respirators when dealing with diesel exposures above the TLV. We have not received a response. The generally held position is that as long as there is no mist (liquid) present, and the vapor is no condensing on skin from a saturated atmosphere, the situation is one involving vapor exposure only, and no significant liquid contact will take place on exposed skin.

Importantly, in the 2004 TLVs & BEIs handbook ACGIH published that they are looking at individual TLVs for vapor and aerosol for diesel fuel. Although this makes no promises it indicates that the MCA's effort for reconsideration to be given to the TLV are not going un-noticed.

Finally, I wish to extend my sincerest thanks to the chemists and their industrial partners that generated this revealing data, especially Lamar Lebauve, Jeff Carr and Dave Bennett.

Greg Grondin, CMC 676, MCA Chairman

SECRETARY'S DESK -

Elections in 2005 - The MCA is scheduled for elections this spring. As a reminder:

- The election is for the office of Chairman-Elect.
- The term is for two years, after which the Chairman-Elect becomes Chairman, the Chairman becomes Past Chairman, and the Past Chairman becomes a living legend.
- To run for election a candidate must be nominated in writing by at least one member of each of the MCA's three sections. In addition, the candidate must send a letter to the Executive Committee expressing their commitment to serve. (Nominations and the candidate's letter for this year's elections must be received to the MCA Secretary by March 15 of 2005. Reminders will be sent in January.)
- Letter ballots will be sent to all members and must be returned by April 30th, 2005.
- Installation of the new officers will take place on the first day of our Annual Seminar (July 25, 2005, Portland Oregon).

The Chairman-Elect's duties include being present at and assisting Executive Committee Meetings and serving as Chair of the Education Committee for their term. Upon assuming the position of chairman, they chair ExCom meetings (Usually three each year, held in conjunction with seminars when possible) and serve as spokesman for the Association as needed. Duties of the Past Chair include serving as chair of the Nominations and ethics Committees. In addition MCA officers may be asked or volunteer, as possible and willing, to assist the Association on any number of tasks and committees that serve our profession, and the health and safety of our industry and its workers. Expenses for this work are reimbursed by the Association's established policy.

Service to your profession is a wonderful and rewarding experience, and, though sometimes challenging, is a way to come to meet and know your fellow professionals, be part of our common family, make important contacts in our industry, and understand your profession in a manner not possible any other way. The Chairmen, representatives and the other officers of your association over the past few decades have done tremendous front-line service for our industry and its workers. Please consider your vote, and if interested and available, a potential candidacy, and support the process with a prompt return of your considered ballot.

MCA Meetings in 2005 - The meeting locations and dates for the spring sectional and annual seminars has been fixed.

Annual Seminar:
Monday 25 July- Wed. 27 July 2005
(ExCom Meeting, Sunday 24 July)
Hilton Portland & Executive Tower
921 Southwest Sixth Avenue
Portland, Oregon 97204-1296
503/226-1611
www.portland.hilton.com

Gulf-Inland Sectional Seminar:
(ExCom Meeting, Sunday February 27
Saturday, February 26
New Orleans Hilton Hotel
504/469-5000

Atlantic Sectional Seminar:
Sunday, March 13
Norfolk Hilton Hotel
757/466-8000

Pacific Sectional Seminar:
Saturday, March 19
InnSuites Hotel
Tucson, AZ
520/622-3000

Les Blaize has done a terrific job in selecting the hotel and activities for the Annual Seminar to be held in his home city in Portland. The MCA hasn't been there in almost 20 years but those of us that went there for the last one had a really wonderful time. Many thanks to Les and Barb for work already done and in expectation of a great time.

Demographic Survey - At the request of the MGHC and MFSA Committees, the most current data was assembled to paint a picture of how well we are replacing ourselves. A quick glance at the back page gives a snapshot of where we are as a profession after seven years. On the up-side we've increased the size of our profession by about 9% and the numbers have been climbing slowly but steadily since our last survey. On the down-side, we've aged a professional average of four years in the last seven - we ideally should be steady on that score. Nevertheless, there is some confidence that in the back of every practicing chemist's mind is the responsibility to replace himself with someone who will be a credit to the industry and profession. Becoming a marine chemist isn't easy, but it's a great and distinctive profession that can provide a good living in the right place, and essential service to a potentially dangerous and essential industry.

Have you located yourself on the charts on the back page? Where are you in meeting that responsibility?

MACOSH INITIATIVES - The Industry-Labor-Government MACOSH (Maritime Advisory Committee for Occupational Safety and Health) Committee has met twice this year (March 3-4, June30-July 1, 2004, in Washington, D.C.), and has had an impressive list of accomplishments. The Committee is considered a great success and OSHA has complemented the Committee as one of its most valuable and productive. They have developed instruction tools along with OSHA, and commented on a number of health & safety issues affecting the marine industry. The issues, presentations and discussions of OSHA's standard and guidance activities included the proposed standard for hexavalent chromium, maritime enforcement, alliance and partnerships, outreach activities, homeland security, longshoring safety issues, emergency preparedness efforts as well as a report on the MACOSH work groups - but, up to now, little affecting marine confined space work in general, and SCP and CMC issues in particular.

The year's final MACOSH meeting is scheduled for December 7-8, however, and as a result of two developments, confined space work-related matters may be in the Committee's crosshairs. First were the surprising legal developments surrounding lawsuits filed in federal courts by Trinity Industries, Inc., (involving appeals of OSHA citations involving a dual fatality that occurred in 1995). They were decided by OSHA's Review Commission, and upheld upon appeal to district federal courts. The Review Commissions findings seem incredibly poorly informed and have an impossible burden implied by their interpretation for the marine industry and the use of CMCs and SCPs. In addition, the new 29CFR1915 Subpart P, "Fire Protection in Shipyard Employment" has been promulgated and is effective on December 14, 2004. A host of questions about exact interpretation of the new standard have surfaced, and even though Subpart B is <u>not</u> affected by Subpart P, hot work safety and interpretation issues and discussion should involve SCPs and CMCs because they are closest to the issues in the field. All MACOSH meetings are open to the public. The MCA will have observers at the next meeting ready for comment as asked and as necessary.

ASA SHIPYARDS: Formerly "Big Six" now, really, "Big Two" - Since the majority of US shipyard workers are employed by just six shipyards, it's important to keep track of who represents the movers and shakers in the industry. ASA (American Shipbuilding Association) represents the largest shipyards in the U.S. Those shipyards currently (still) consist of Avondale, Ingalls, Newport News (which are Nothrop-Grumman owned companies), and NASCO, BIW and Electric Boat (which are General Dynamics owned companies). Furthermore:

On 5/30/04 Bath Iron Works (BIW) largest union, IAMAW Local S6, voted (reportedly 80% in favor) to accept the company's proposed 4-year contract.

BIW has been certified to ISO 14001 and OHSAS 18001 standards. The 14001 standard ensures that a company has a comprehensive environmental management system in place and the 18001 standard addresses the safety system within the shipyard. BIW is the first shipyard in the country to hold both certifications.

ACCIDENTS – Quite a pile of them that have been accumulating - some already discussed but not included in the Newsletter. Most are marine in nature but some are just too interesting to ignore mentioning. (The editor disavows any notion that he has been picking on China - it's just that that's where some really interesting news is coming from. Honest)

Tow Boat Burns - The large towboat M/V CLAY GRIFFIN had the misfortune of being watched over by a less-than-perfectly attentive fire watch on June 18, 2001. While at Bollinger's Houston Shipyard and under a marine chemist's certificate, the required and posted fire watch was reported to be bored and elected to help his employer out by attending to necessary welding elsewhere. Someone interrupted the welders some time later to inform them that the boat appeared to be on fire. Burning a shell plate against stored engine filters on a shelf inside the vessel evidently did the trick. The Waterways Journal indicated that fighting the vessel fire caused the floating drydock it was on to partially sink. The fire damaged the forward stores, the vessel bunkroom and lounge, and did a good deal of smoke damage. The fire went to three alarms and involved some eighty firefighters. There were no reported injuries or environmental releases, and Bollinger repaired

the vessel. It is assumed that the overall happenings livened up the bored fire watch's evening. (Thanks to John Bell and Jim Bishop)

Hit and Run – Joe Schneider sent copy of a Reuters news clip indicating some bad practices are world-wide. This past June 6, 2001 Romania issued an arrest warrant for three men associated with the Maltise tanker M/V ANOPOLIS after an accident killed ten welders while in the port of Constana on the Black Sea. One of the three men sought evidently forged papers amounting to a local hot work permit. The other two are being sought for "causing death by negligence. The forged certificate indicated the vessel was gas free, but the accident proved it to be "a dangerous floating bomb", according to Romanian Privatization Minister Ovidiu Mussetescu. The Reuters' article states the "workers' statements show they were put under pressure to start repair work under unsafe conditions." (And you thought it only happened in the US....)

Chinese Accidents - In July, 2001 at least 22 people were crushed to death when a huge, brand-new crane toppled over in a Shanghai shipyard, one of a string of deadly accidents that highlighted China's woeful safety standards. The Xinhua news agency said 11 people were still pinned under the wreckage of the 600-ton gantry crane and there was little hope of getting them out alive. Three people were seriously injured and hospital doctors told Reuters their chances of survival were slim. Employees at the Hudong China Shipbuilding plant in the port city's Pudong district said the crane collapsed on a group of workers and engineers on Tuesday morning. With ribbons and flags still attached from a ceremony on Monday before the enormous crane was put into operation, it lay crumpled on its side amid rusty iron support pillars. The cause of the accident was not immediately known. People living in the shipyard workers quarters 100 yards away said the crane toppled around 8 a.m. Safety standards in China have plunged to such depths the issue has become one of the biggest threats to the credibility of the government. Public anger rose along with the death toll from a series of fires, explosions and building collapses. In an attempt to control the bad news, and limit political damage, new rules issued last month said only Xinhua could report on accidents and natural disasters. They were widely ignored. Accidents are often linked to corruption and negligence and are widely seen as evidence that government at all levels has lost touch with the concerns of ordinary Chinese. After a 2001 blast killed at least 42 people in an east China school, most of them children, Premier Zhu Rongji apologized to the nation and said provincial leaders would be held personally responsible for future lapses. But there was almost no let-up in the carnage. The same week, part of an oil drilling control platform riding on a flatbed train carriage worked its way loose and cut a swathe of destruction along a 10-mile stretch of track. At least 22 people were killed and 15 injured as a metal arm jutting from the speeding train scythed down electricity poles and hoardings. - (Reuters) (And as a progress report, just last week (i.e., October 2004), scores of miners were killed in a gas explosion in a Chinese coal mine.)

Tank Car Accident –"If you haven't heard, there was a confined space double fatality not too far from here. (Where?) Here's what I've heard so far but be cautioned, this information is from a "usually reliable" source but is very preliminary and may turn out to be wildly erroneous. Two employees were to clean a railroad tank car that had contained soybean oil. The first worker entered the tank and became unresponsive. The second worker stayed topside, yelled for help but did not enter the tank. A third employee came to the scene and entered the tank. Both entrants died. Soybean oil tends to oxidize and form a thick rubbery layer. To preserve the oil the tank normally has a nitrogen atmosphere. In this case (with an empty tank) the space was apparently inerted with nitrogen.

The third employee (second fatality) was the safety director. He reportedly had a monitor on his belt when he entered. These incidents are very disturbing because they are so easily prevented. Understanding the nature of the space, pre-entry testing, ventilation, non-entry retrieval equipment -- the list goes on." (Submitted by George Hutcheson, AIHA CS Committee, September 4, 2001)

Custom's Agent & Crew Members Killed - Three men, including a U.S. Customs agent, died in the hold of a ship that was bringing in scrap metal to a steel mill in August 2002 in LaPlace, LA.

At about 3 a.m., the men apparently went into an area of the hold that had an insufficient amount of oxygen, passed out and died. Mike Palmer, assistant chief, LaPlace FD, said crewmembers had removed one of the men when firefighters arrived. Firefighters with SCBAs entered the hold and removed the others.

Thomas M. Murray, 52, a U.S. Customs senior inspector, went into the hold for a routine inspection. The ship's captain and a crewmember followed him after the inspector did not return. A second Customs inspector and a crewmember were hospitalized.

The ship, the Panamanian-flagged Sakura I, had docked at the Port of Gramercy to make a delivery to Bayou Steel Corp. The vessel had come from Santo Domingo, Dominican Republic. The freighter was undergoing a routine inspection before its transfer to Bayou Steel. (Thanks to Troy Corbin, Source: The Daily News - August 30, 2002, & OSHA Report)

Galveston Dual Fatality - Two men were killed Thursday, August 29, 2002, while working aboard an oil rig moored at Pier 34 in Galveston. Galveston fire, police and emergency medical service personnel worked for more than three hours to recover the bodies of two men trapped in a platform about 40 feet down inside one of the rig's legs. GFD Batallion Chief Mike Varela said it was believed the workers suffocated while cleaning inside the rig's leg. An EMS worker at the scene said that the oxygen level in the leg measured at 8 percent. Donning SCBAs, firefighters were lowered into the platform leg. Once they reached the bodies, they were moved to the bottom where contractors had cut through the side of the leg. Firefighters commented it was "hot and dark" in the rig's leg, and that oxygen levels were dangerously low. The victims were not wearing breathing equipment.

The rig, the Diamond Ocean Quest, was reportedly in port for routine repairs. The legs, typically filled with either seawater or drilling mud for ballast, were being cleaned and checked for subsurface damage. A firefighter said that the rig had been sealed for five years and had just been opened the day before the accident.

Repeat Canadian Shipyard Fatalities - In what was claimed as a worker's fatal mistake compounded by the instinctive loyalty of friends, three men were killed while repairing a barge in New Westminster, British Columbia, Friday, January 10, 2003. The trio of shipyard workers died from a lack of oxygen in a sealed vessel space. Another three men, including a firefighter who tumbled more than twelve feet while attempting a rescue, were injured.

Events began when one worker, reportedly (by the yard owner) acting on his own, entered a tank on the barge Sea-Link Rigger as it was docked for maintenance at the Westminster Marine Services LTD.'s yard in New Westminster, B.C. The worker had been assigned to straighten the bolts and the seals of the vessel's hatches prior to the vessel's being returned to work. The incident began when one worker noticed one man failed to take the morning break. Another workers went to find him. When he didn't come back they followed, one after another, right up to the incident involving the fireman. According to the yard owner, all his men were supposed to work on the hatches, only - no one was to enter the spaces below. When the last man killed was entering the space, others were nearby telling him not to enter - but he proceeded in an attempt to rescue those already in the tank. All the workers were friends

The last would-be rescuer, the fireman, entered and fell to the deck. He landed in about six inches of water, breaking ribs and injuring his shoulder. He was retrieved unconscious, but alive. Final score: three injured, three killed.

Canadian shipyards are required under their WCB [Workers Compensation Board] regulations to test the air before entering sealed marine spaces. (About five years ago a very similar accident occurred in Vancouver, B.C., and the response was to pour money into rescue equipment and emergency response training. Canadians have evidently avoided putting in place an effectively enforced testing program). (Thanks to George Blair, Don Sly and others. Source: "The Province", Sunday, January 12, 2003)

Worker Dies in Gas Station Explosion - In Lacy, Washington, a worker involved in inspection and repair of an underground gasoline storage tank was killed when something ignited vapor in the tank on Tuesday, September 2, 2003. The tank job was one of a series of routing inspection and repair jobs handled by the Tank Liners Central, under contract to Chevron stations. Workers take the tanks out of service, and work in them while inerted or (assumed) above the UEL while in air supplied respirators. The station was open for business at the time, and the worker, hurled through the air, landed in front of customers walking in the area fueling their vehicles. He was pronounced dead at the scene. (This is the third fatality involving workers doing this work that has been forwarded to the MCA in the last ten years.) (Thanks to Don Sly and George Blair. Source: KOMO 1000 news release.)

Slow Leak & Fast Lawyers - The odor of rotten eggs drifting over portions of West Baton Rouge Parish on Wednesday, August 1, 2001 was

attributed to chemical vapors leaking from a barge moored on the west side of the Mississippi River. Perhaps as no surprise, as of early that afternoon, attorneys had filed a class-action lawsuit against the barge's owners and operators, claiming that at least 2,000 people may have been affected by the chemical release. Louisiana State Police spokesman Johnnie Brown identified the chemical as sodium hydrosulfide solution. He stated that he didn't believe the vapors are harmful, but residents were asked to shelter in place for much of the day as a precaution.

"The smell itself is not cause for alarm," Brown said.

Officials became aware of the incident shortly before 9 AM when faculty members at Lukeville, Louisiana, Upper Elementary School notified the Brusly Fire Department of the pungent odor. The Fire Department made the decision to send the faculty and 400 students home.

He said officials with the state Department of Environmental Quality tested air in the Lukeville area within a half-mile radius of River Road and found no recordable readings of the chemical. A private company, Oil Mop Inc., was contracted to isolate and repair the leaking barge, moored on the west side of the river between Addis and Brusly, Brown said.

Crews determined the site of the leak to be a bad seal on a monitoring gauge, allowing vapors to leak off the vessel, Brown said. The problem was corrected and portions of River Road were reopened to traffic. The request for residents to shelter in place was lifted about 1:45 PM. The lawsuit, filed about 1:40 PM by three attorneys on behalf of four named plaintiffs and "others who are unnamed but present in the Brusly and Lukeville areas at the time of the leak, claims that the defendants "failed to report the release and it could have avoided exposing so many individuals had it properly notified authorities." The suit also asserted that the chemical caused upper respiratory to people in the area. It named American Commercial Barge Line LLC and Kirby Corp. as defendants. (Fast work!)

"This is a dangerous substance, but only if you're right on top of it," Coast Guard Petty Officer Kyle Niemi said. He said the Mississippi River remained open for traffic because the wind was carrying the material away from the river. The barge was taken to a fleeting area near Port Allen at Mile Marker 237 to remove the product and make repairs. (Thanks to Troy Hebert. Source: Westside Bureau)

Bouchard's Bad Year - When the BOUCHARD-125 blew up on March 4, 2003 while at a terminal in New Jersey, the NTSB and USCG, as expected, came together to investigate. The video clip of the explosion, caught by a remote camera some three thousand feet from the detonation, makes a spectacular teaching aid for anyone needing instruction about the need for care in the marine repair and fuels transportation industry. Two men were killed in an accident that blew the barge to pieces. About six weeks later (April 27, 2003), the B-120 hit a rock and released about 90,000 gallons of heavy F.O. into Buzzards Bay - the fourth major spill in that area in recent years. After reviewing records and testimony, NTSB and USCG were notified that the Justice Department was taking over the investigation of the Bouchard-125 explosion. (Source: Conversations with NTSB and Marine Digest & Cargo News)

Chinese Sub Crew Lost - - On May 2, 2003 China announced that all 70 crewmembers of the 250 foot "Ming-class" submarine 361 died while taking part in exercises in the Yellow Sea. Citing only "mechanical problems" as the reason, the vessel was located submerged, snagged and towed back to an undisclosed Chinese port. (Source: Marine Digest & Cargo News)

Tank Blast Kills Florida Worker - A colossal explosion rocked the Florida town of Brandon on Wednesday Nov 17, 2003. Though neighbors first thought it was a terrorist attack, it was actually an explosion at a nearby gas station. One worker was killed, another critically injured and it left the neighborhood frightened and shaken. Officials said the blast was sparked by an electric saw used too close to vapors in one of the gas storage tanks outside a local market. The business had been closed for a few days for renovations, and the property owner was having the underground gas storage tanks removed and planned to sell or develop the land for other uses. The tanks were about 8,000 gallons, about 8 feet in diameter by 30 feet long and made of fiberglass-wrapped steel. Once the gasoline was removed, the tanks were hoisted above ground, where they sat for several days. On Wednesday, nine workers, including the victims, were removing gasoline vapors by filling them with an inert, non-explosive gas, officials said. Workers then used an electric saw to cut large

holes in one end of each tank, allowing remaining vapors to escape. But as the worker who was killed was cutting into the third tank, an explosion erupted and sent flames shooting into the convenience store. ``It appears right now that there was a breakdown of some sort in the process and that not all of the gasoline vapors were flushed out before the worker began cutting with the electric saw,'' officials said. The convenience store was empty, and no one else was hurt, officials said. Hillsborough Fire Rescue, the Hillsborough County Sheriff's Office, agents with the federal Bureau of Alcohol, Tobacco, Firearms and Explosives, Florida's Fire Marshal's Office and investigators with federal OSHA all responded. A record search of the cleaning company showed no history of safety violations. (Thanks to Joe Schnieder. Source: The Tampa Tribune, Nov 20, 2003)

Ethanol Tanker Explodes & Sinks - On Saturday, January 28, 2004, while in transit between New York and Houston, the 571 foot chemical carrier M/T BOW MARINER blew up and sank off Virginia. Six crewmembers were rescued and 21 lost. No reasons for the explosion were given by surviving crewmembers. No repair was known to be underway, most crewmembers were asleep, and the explosion appeared to originate near the bow tanks. Semi-automated tank cleaning may have been underway, however. The water-soluble cargo dissipated without trace, but the ships fuel left a slick six miles long and a mile wide. (Thanks to Robbie Walker & Guy Colonna)

H_2S on Navy Vessel Kills One - A Hull Maintenance Technician Fireman Apprentice on the USS JOHN F. KENNEDY (CV-67) was killed on April 6, 2004 while in Jacksonville, Florida while working on the vessel's CHT system. His work-mate was hospitalized. (This specific fatality, i.e., H_2S exposure while working on CHT systems, is evidently now the most common confined space fatality on US naval vessels.) (Thanks to Tom Littlepage)

Raging Hormones Divert Cruise Liner - The M/V LEDGEND OF THE SEAS was diverted on April 23, 2004 from Hilo to anchor off Honolulu. She was then boarded by 120 members of a joint FBI/USCG/Honolulu Police Terrorism Task Force to search the vessel for the source of two threatening notes left in the ship's public bathrooms. (I didn't know they had that many police and agents in Honolulu!) After ten hours the vessel was allowed to proceed and a 20 year old California woman was arrested, charged with writing the notes. The reason? - she didn't want to be on the forced cruise with her parents while her boyfriend was back on the mainland. It seemed a good way to end the cruise. It was effective - for her. She got a month in jail, pleaded guilty and was released after paying a $5,000 bond. She was also ordered to stay away from her boyfriend. (Source: Marine Digest & Cargo News)

TAKE TIME FOR TEN THINGS

1. Take time to work - it is the price of success.
2. Take time to think - it is the source of power.
3. Take time to play - it is the secret of youth.
4. Take time to read - it is the source of knowledge.
5. Take time to Worship - it is the highway of reverence and washes the dust of earth form our eyes.
6. Take time to help and enjoy friends - it is the source of happiness.
7. Take time to love - it is the one sacrament of life.
8. Take time to dream - it hitches your soul to the stars.
9. Take time to laugh - it is the singing that helps with life's blood.
10. Take time to plan - it is the secret of being able to have time to do the first nine things. (Source: Parish Cookbook, St. Philip's Church, Grafton, Massachusetts)

VESSEL POWER - In an article addressing emissions aspects of marine vessel propulsion, ("NOx Emissions from Marine Ships", Horst W. Koehler, Marine Reporter & Engineering News, June 2003, pp. 68-71.), the author gave a breakdown and useful snapshot of vessel propulsion types and distribution. The data used was for that available up to 2001, but the trend is clear.

The study classified the world's 89,100 vessels of greater than 100 gross tons. The power plant total of these vessels was 286,000 MW, or 3,830,000 horsepower. Approximately ninety-five percent of that power is now provided by diesel engines, with only 4% by venerable steam turbine or newer-age gas turbine (not otherwise broken down, but of course, the percentage of gas-turbines is rising while that of steam-turbine vessels is falling). The remaining less than 1% power was provided by "other, unknown or not determined" sources.

Of the diesel engine types, roughly four of every ten diesels is the slightly cleaner four-stroke design, the rest being the somewhat dirtier two-stroke design. Generally, the older, lower-rpm two-strokes are responsible for far lager amounts of all pollutants (NO_2, NO, CO and unburned/partially-burned hydrocarbons) than the newer higher-rpm four stroke engines. All included, the author indicated 86% of all marine vessel power plants were older unregulated designs and as such the source of far more pollution than would be emitted from modern designs.

The horsepower is provided Mr. Koehler found that the breakdown of vessel type was:

Vessel Type	% of All Vessels	% of All Vessel H. P.
Bulk & Combination Carriers:	7%	16%
Container Ships:	3%	16%
Crude Carriers/Tankers:	~1%	7%
Product Tankers:	10%	9%
Fishing (Processing/Factory):	26%	6%
Gas Carrier (All types):	~1%	3%
General Cargo:	27%	26%
Tugs:	14%	9%
Others:	11%	8%

(Of interest and not apparent from the above charts, however, is that the API estimated in the 1990s that, by displacement/total tonnage, product and crude oil tankers at approximate 11% of all vessel types, represent approximately 30% of all marine tonnage, and produce about 16% of all vessel types horsepower. Though tankers, especially crude carriers, are not the greyhounds of the ocean, they are dedicated to carrying more of a single commodity than any other vessel type - perhaps in all human history) and do so quite efficiently.

These vessels were estimated by the author as consuming about 281 million tons of bunkers - about twice that reported by the oil industry. (The reasons for the wide discrepancy, according to the author, may be that the oil industry's distribution data and it's definition of international bunkers differ from what actually winds up in vessel fuel tanks. The author based his calculations on performance and running data provided from various reports from actual vessel operations sources.) Interestingly and confirming what is widely held by all chemists, most of what is burned in marine vessel 'diesels' is not the cleaner DFM, but treated heavy (black) fuel oil: 191 million tons of HFO v. 90 million tons of DFM and lighter marine gas oil.

ROGUE WAVES - In a news brief entitled "Surf's up - Way Up", October 2004's Scientific American surprisingly noted that over 200 tankers and container ships have been sunk by bad weather in the past twenty years, and researchers believe that enormous "rogue waves" may often be the culprit. Most vessels are designed by their architects to withstand waves of up to 15 meters - an impressive pounding indeed. U.S and German researchers, however, analyzing just three weeks' global radar data, identified twenty-five waves over 25 meters - essentially an eight story buildings'-worth of water hammer traveling the oceans. After announcing the findings on July 21, the European Space Agency announced an intended two-year review and compilation of satellite data that will cross-reference large ship losses with rogue wave occurrences, and possibly forcasting conditions giving rise to killer waves. Not surprising, the study has already revealed that some rogue waves occur where multiple high-energy wave systems intersect.

A gaggle of future chemists at the MCA Annual Seminar held in Washington D.C.: The Russell, Dovinh, Bell, Nunn and Calton Kids having a great time.