



ISCO NEWSLETTER

The Newsletter of the International Spill Response Community
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*Evaluating & Addressing Potential Underwater Threats
Washington DC – June 6-7, 2011*

News

DEEPWATER HORIZON – ONE YEAR ON

It happened on April 20, 2010. The anniversary has prompted a flood of articles and news stories but we can only highlight a few for you.

April 22 - NRDA Trustees Announce \$1 Billion Agreement to Fund Early Gulf Coast Restoration Projects - Under an unprecedented agreement announced today by the Natural Resource Trustees for the Deepwater Horizon oil spill (Trustees), BP has agreed to provide \$1 billion toward early restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the spill. The Trustees involved are: Alabama, Florida, Louisiana, Mississippi, Texas, the Department of the Interior (DOI), and the National Oceanic and Atmospheric Administration (NOAA). The Department of Justice provided assistance in reaching the agreement. [Read More](#)

April 22 - Deepwater Horizon Joint Investigation Team releases preliminary report covering issues under Coast Guard jurisdiction - The Joint Investigation Team charged with examining the explosion on board the mobile offshore drilling unit Deepwater Horizon and resulting oil spill – comprised of representatives of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) and the U.S. Coast Guard – announced Friday that the Coast Guard members of the team have released their findings related to issues under Coast Guard jurisdiction.

The findings, which comprise Vol. I of the Joint Investigation Team Report, cover five aspects of the disaster – including the explosions on the Mobile Offshore Drilling Unit (MODU) Deepwater Horizon; the resulting fire; evacuations; the flooding and sinking of the Deepwater Horizon; and the safety systems of the MODU and its owner, Transocean. The findings released today do not include an analysis of what led to the loss of well control or other aspects of the investigation that fall under BOEMRE jurisdiction.

Volume I can be found online at <http://marineinvestigations.us/> under the marine casualty reports section. It details 61 conclusions, 54 safety recommendations

News (continued)

and nine administrative recommendations. It is not a final report; this volume comprises recommendations to the Commandant of the Coast Guard. A review and response to these recommendations will be completed in the coming months.

April 18 - US oil spill containment firms may work together-BP - Two competing oil spill response systems developed for the Gulf of Mexico in the aftermath of the massive BP oil spill may eventually join forces, a BP executive said on Monday. Exxon Mobil and other oil majors formed the non-profit Marine Well Containment Company (MWCC) to develop a system to rapidly respond to major spills after BP's oil spill exposed the lack of equipment available to contain a deepwater spill. Helix Energy Solutions Group Inc also developed a separate response and containment system for Gulf producers after the BP drilling disaster.

At the first meeting of a new government advisory panel on offshore drilling issues, the Ocean Energy Safety Advisory Committee panel questioned whether having two separate safety systems was practical when there was limited design expertise in that area. [Read more](#)

April 18 - BP Blowout One Year Later: Drilling Safety an Explosive Issue - Hundreds of activists protesting fossil fuels marched to the Department of the Interior's headquarters today and swarmed inside, calling for the abolition of offshore oil drilling, coal mining and tar sands extraction. The demonstration was timed to mark the one year anniversary of the BP Deepwater Horizon blowout on April 20, 2010 that killed 11 workers and spilled 4.9 million barrels of crude oil into the Gulf of Mexico.



In the picture: Dr. Thomas Hunter chairs the Ocean Energy Safety Advisory Committee (Photo courtesy Sandia National Lab)

On the government side, the new Ocean Energy Safety Advisory Committee held its first meeting today, setting deepwater drilling safety, oil spill source containment and cleanup as its top priorities.

Chaired by former Sandia National Laboratory Director Dr. Tom Hunter, the committee is made up of [15 scientific, engineering and technical experts](#) from federal agencies, the offshore oil and gas industry, universities and research organizations.

The committee will advise the Secretary of the Interior through the Director of the Interior Department's Bureau of Ocean Energy Management, Regulation and Enforcement, BOEMRE. This is the agency that once was the Minerals Management Service until internal corruption was exposed in a report by the U.S.

Inspector General last May, about a month after the BP well blowout. [Read more](#)

April 14 - Critics challenge Coast Guard clean up efforts in Grand Isle - On Grand Isle, a busy scene of clean up machines and workers remove remnants of tar balls on the island almost a year after the BP oil disaster. The U.S. Coast Guard says it's a daily ritual, but as a Coast Guard representative updated the public on the cleanup efforts, some residents had looming concerns.

The U.S Coast Guard though, says almost 92 percent of Louisiana's shore line is now clean. As for tar balls still surfacing across the Gulf Coast, those overseeing the clean up say much of it is not oil.

Some critics say the problem is bigger than the tar balls they're collecting along the coast line. They say there are huge areas of oil nearby that's simply not getting cleaned up. [Read more](#) [Thanks to Don Johnston of ISCO Associate Member, DG & Hazmat Group for providing the link to this story]

April 20 – National Geographic - Why Did Huge Oil Plumes Form After the Gulf Spill? - Scientists may have partially cracked a lingering mystery of the [Gulf oil spill](#): why [huge plumes of oil spread for miles underwater](#) instead of rising to the surface as slicks.

These plumes were caused in part by [unprecedented amounts of chemical dispersants injected near the leaking Deepwater Horizon wellhead](#) in an effort to better disperse the oil from forming big globs—much like grease-cutting soaps do for dirty dishes. At the time when the plumes were first discovered, attention had focused largely on tracking them and predicting their impact on marine life.

But a bigger question is why the plumes formed at all. After all, anyone who's ever seen the sheen of oil on a puddle or shaken a bottle of salad dressing knows that oil floats. "Oil and water don't naturally mix," said [Richard McLaughlin](#), an applied mathematician at the University of North Carolina, Chapel Hill. What happened is that the dispersants broke the oil into micro-droplets that merged with the deep-sea water, then rose slowly, said McLaughlin, who was researching ocean-mixing problems like these well before the Gulf oil spill.

But the water at the seabed isn't the same as at the surface. Not only is it colder, it's saltier and therefore denser. The result is that the micro-droplets didn't float all the way up. Rather, they rose to the level at which they were the same density as the surrounding water—and stayed there, according to lab experiments by McLaughlin and colleagues Roberto Camassa and Brian White. [Read more](#)

April 20 - 1 year after spill, 3,200 Gulf wells classified as active are really abandoned - One year after a deadly oil-rig explosion set off the worst offshore spill in U.S. history, the environmental minefield of abandoned wells in the Gulf of Mexico is worse than first thought, with no quick solution in sight. A government list obtained by The Associated Press shows that in addition to 27,000 oil and gas wells that were sealed with cement and abandoned without any regular monitoring, another 3,200 old wells have quietly been left unused without any cement plugging to help prevent leaks. [Read more](#)

JAPAN NUCLEAR CRISIS UPDATE

April 21 – **IAEA Briefing** - Overall, the situation at the Fukushima Daiichi nuclear power plant remains very serious, but there are signs of recovery in some functions, such as electrical power and instrumentation.

At a press conference held at 11:00 (Japan local time) on 21 April, the chief cabinet secretary, Mr. Edano, announced the establishment of a no entry zone around Fukushima Daiichi nuclear power plant, as well as basic policies concerning temporary re-entry. As of midnight (Japan local time) on 22 April 2011, the area within 20 km of Fukushima Daiichi nuclear power plant is announced as a no entry zone.

Chief cabinet secretary, Mr. Edano, also announced a re-designation of the evacuation zone around Fukushima Daiichi nuclear power plant. He announced that "the size of the evacuation zone around the station would be reduced from 10 km to 8 km," and that "the order to evacuate based on the incident at Fukushima Daiichi nuclear power station would be lifted from areas farther than 8 km around the station." [Read more](#)

April 23 - **No-entry zone sealed, residents fear they will never return home** - The 83-year-old man spoke with tears in his eyes. "It's all over. It is better to just die." He had just learned his small farm would be sealed off at midnight April 21 inside the government's no-entry zone around the Fukushima No. 1 nuclear power plant. Like many with properties within a 20-kilometer radius of the crippled plant, he feared the worst—that he would never see his home again. [Read more](#)

April 17 - **Tokyo Utility Lays Out Plan for Its Reactors** - The Tokyo Electric Power Company laid out an ambitious plan on Sunday for bringing the reactors at its hobbled Fukushima Daiichi nuclear power plant into a stable state known as cold shutdown within the next nine months and for trying to reduce the levels of radioactive materials being released in the meantime.

The blueprint for action represents Tokyo Electric's most concrete timetable yet for controlling the reactors and improving safety at the plant, which was damaged by a massive earthquake and tsunami nearly six weeks ago.

The first part of [the plan](#), expected to take three months, would include building new cooling systems, critical to preventing catastrophic releases of radioactive materials. The company then hopes to cover three badly damaged reactor buildings and install filters to reduce contamination being released into the air. [Read more](#)

April 19 - **TEPCO aims for cold shutdown in 6-9 months, but no guarantees** - Tokyo Electric Power Co. has presented a two-stage scenario to stabilize the crippled Fukushima No. 1 nuclear power plant, but it is unclear whether its goals can be achieved as scheduled. At least six months will be needed to achieve a cold shutdown of the reactors, which means bringing core temperatures under 100 degrees, according to the company's road map announced April 17. [Read more](#)

April 19 - **Robots detect dangerous spike in reactor 3 radiation** - Robots sent in to explore the Fukushima No. 1 nuclear plant have found high radiation levels in three reactor buildings that may seriously hinder efforts to bring the plant under control, Japan's nuclear watchdog said Monday.

On Sunday, two U.S.-made robots checked radiation, temperature and oxygen concentrations in reactors 1 and 3 to see if they were safe for repair crews to enter to get the crippled cooling systems back online. [Read more](#)

April 20 - **TEPCO starts to pump out turbine 2 unit** - Tokyo Electric Power Co. started Tuesday pumping highly radioactive water at its Fukushima No. 1 nuclear plant's reactor 2 turbine building into a nearby storage facility, a crucial step toward restoring the reactor's dedicated cooling system, the government nuclear watchdog said. [Read more](#)

Two pages of useful reference documents assembled by the Energy Institute [Look at these documents](#)

ITOPF DESIGNATED AS VISITING PROFESSOR AT THE WORLD MARITIME UNIVERSITY

Statement released on April 21: ITOPF is pleased to announce its acceptance of the appointment of Visiting Professor at the World Maritime University (WMU), effective from April 2011. The appointment, initially for a five-year period, recognises the vital and extraordinary teaching contribution that ITOPF offers to students of the Masters of Science in Maritime Affairs programme, particularly the Maritime Safety and Environmental Administration Specialization (MSEA).

Many of the WMU's graduates from developing countries subsequently take up senior positions in their government administrations. The foundation that is provided by the WMU's teaching programme ensures that these graduates are fully aware of the IMO's regulatory framework for shipping and, thereby, able to further its aims and objectives. ITOPF will contribute to the lecturing programme of the WMU by sharing its extensive practical knowledge of the fate and behaviour of oil in the marine environment and illustrate best practice in responding to spills using case studies. Alex Hunt will be the first visiting professor under this new appointment. We look forward to supporting the WMU in this way. <http://www.itopf.com/news-and-events/>

EUROPE TO PRESS OIL GIANTS ON DISASTER CLEAN-UP RESPONSIBILITIES

European Union Energy Commissioner Günther Oettinger is preparing legislation that would force oil drillers to clean up pollution up to 200 nautical miles off Europe's coasts.

The current EU "polluter pays" principle only applies to spills within a distance of 12 nautical miles.

"We're doing everything to make sure that catastrophes, like in Fukushima or a year ago in the Gulf of Mexico, don't happen in Europe," Oettinger told German daily Die Welt on Wednesday.

A spokeswoman for Oettinger said the EU already had legislation in place governing oil platforms, but nothing dealing specifically with platforms far out at sea.

"The majority of the oil drillings do not take place within these 12-mile zones, but beyond that, until the 200-mile zone," Marlene Holzner told Deutsche Welle. "So we do intend to extend this jurisdiction to the 200-mile zone so that all the oil drillings we have in Europe are within this directive.

"We just wanted to learn from the US experience, and we are now trying to close this loophole," she said.

"The second aim is that once a disaster happens, we would like to make sure that the company has to pay a remedy for the whole situation, and that it has the financial means [to do so]," she added. "We would like to avoid a situation by which something happens, you have the damage which is already really bad, but then it is the public authority or the citizens who have to pay for the damage caused." [Read more](#)

ABIDJAN CONVENTION MOVES TO PROTECT AFRICA'S COASTS FROM OIL SPILLS

Nairobi, 20 April 2011 - The coastal waters of West, Central and Southern Africa - from Mauritania down to the tip of the continent in South Africa - are of vital importance to the region's economy. The marine ecosystems and coastal areas support rich fisheries and tourism and are also home to numerous busy ports.

But over the last three decades, rapid development, pollution and improper use of resources have had a damaging effect on coastal ecosystems. Erosion and flooding are also likely to be exacerbated by climate change.

The Abidjan Convention - administered by the United Nations Environment Programme (UNEP) - is an umbrella agreement that addresses pollution, overfishing, dumping at sea, exploration of the sea bed and other activities that can impact on the health of marine and coastal ecosystems.

Now a new focus has been added to the work of the convention: reducing potential risks from oil spills.

Earlier this month, at the 9th Convention of the Parties (COP) to the Abidjan Convention in Ghana, governments from 19 of the 22 countries sharing the West, Central and Southern African coast of the Atlantic Ocean agreed to create an Oil Spill Contingency Plan and establish a regional centre for co-operation in case of oil spills and other emergencies. [Read more](#) [Another report](#)

BRUNEI: BIGGEST EVER OIL SPILL EXERCISE BEGINS

April 19 - Seven crewmembers were reported dead and three more missing after an offshore collision between a cargo vessel, carrying a load of 80,000 cubic metres of crude oil, and a tugboat, 54 nautical miles (100 kilometres) off the Seria Crude Oil Terminal in Belait district yesterday.

Authorities are on high alert as reports have confirmed an oil leak from the ruptured cargo vessel Bou Lung Ghu after colliding with the CABALANAH at 2.20pm. Excessive amount of oil is spilling from the leaked oil containers into the sea and rushing towards the Brunei's coastline. A total of 27 crewmembers were involved in the accident.

This was the scenario to test the National Oil Spill Contingency Plan (NOSCOP) capability of controlling damages in case of an oil spill. Described as the biggest oil spill exercise ever conducted, it is being conducted by the Marine Department in collaboration with 11 government agencies together with Brunei Shell Petroleum Company Sdn Bhd. [Read more](#)

USA: LEADING WATER ASSOCIATIONS JOIN FORCES TO BRING KEY ISSUES TO CONGRESS

The two largest water associations in North America today combined forces for the first time to push for smart approaches to water infrastructure finance and regulation through more than 400 meetings on Capitol Hill.

The American Water Works Association (AWWA) and the Water Environment Federation (WEF) brought more than 170 delegates from water, wastewater and stormwater utilities in 49 states and Puerto Rico for the tenth Water Matters! Fly In.

"Assuring reliable and safe water resources and infrastructure must be a top national priority," said AWWA President Joseph Mantua. "Our water and wastewater systems are critical to the protection of public health and safety, our economy, and the quality of life we enjoy." [Read more](#)

USA: STATE DEPT. RELEASES UPDATED EIS ON KEYSTONE XL

April 18 -The State Department late last week released a supplemental Environmental Impact Statement about the Keystone XL pipeline. Environmental groups say that while this report is an improvement on the first one, it still does not take the environmental threats of the project seriously enough.

The EPA had rejected the State Department's first EIS on the project, calling it "inadequate" and giving the report its lowest rating for accuracy. That prompted the department to agree to issue a more complete supplemental report. But the environmental groups fighting the pipeline say that the new report still skirts key issues. [Read more](#)

UKRAINE RAISES \$785M TO SEAL CHERNOBYL UNDER NEW 'SHELL'

The ruined nuclear reactor at Chernobyl is to be sealed within a 20,000-tonne steel shield designed to prevent any further radiation from escaping for 100 years. It would be large enough to enclose St Paul's Cathedral in London, or the Statue of Liberty.

Governments from around the world have pledged \$785m (£480m) at a conference in Kiev, a week before the 25th anniversary of the nuclear accident in [Ukraine](#) – on 26 April 1986 the reactor suffered explosions and caught fire. This brings the total raised for the Chernobyl safety works to \$1.8bn.

Twenty-eight governments have so far offered money. The [European commission](#) was the biggest contributor with \$143m at the Kiev Nuclear Safety Summit. The US pledged \$123m and Britain, which still has more than 300 hill farms in Wales under radiation restrictions following the fallout from Chernobyl, will contribute \$50m. The European Bank for Reconstruction and Development announced an extra \$172m. Japan, Italy and Canada are considering whether to contribute. [Read more](#)

CANADA: CLEANING OLD WELLS IN ALBERTA'S ORIGINAL OILPATCH IS A TIME-AND MONEY-CONSUMING EXERCISE

An interesting article describing a problem that isn't unique to this location. "Calgary developer Ken Till was on his way to making a fortune during Alberta's last boom when his plans ran smack into the legacy of the province's original boom.

Till was building the first phase of a new residential neighbourhood in Turner Valley five years ago when workers discovered a small natural gas leak. The source was a 1927-vintage well, the third drilled by the now-defunct McLeod Oil Company Ltd. into a massive oil and gas reservoir underneath his Everwood Estates development. "Had it not been for McLeod No. 3, I would have been a wealthy man," Till laments.

In a town that celebrates itself as the birthplace of Alberta's oil and gas industry, it's not unusual to have to clean up old oil sites - some dating back to the First World War - as new lands are developed.

So Till called the province's energy regulator, who in turn brought in the industry-funded organization that deals with old wells whose owners have gone bankrupt, or are long buried. The re-drill and repair on the leak cost Alberta's Orphan Well Association \$2.3 million and took more than a year of work. The McLeod No. 3 well has now gone down in the association's books as its most expensive cleanup in southern Alberta.

For Till, it was 2008 before he got the allclear to begin selling lots again. By then, the economic recession had struck. "We missed the 2007 real estate boom," the developer says with a sigh. "We would have sold every lot we had."

It's hard to go for a walk in Turner Valley without passing near a well, or pipeline, and McLeod No. 3 is just one example of the cleanup the town grapples with in order to grow.

The inheritance from past booms, and the province's first taste of oil and gas wealth, is always present in the town built around the Dingman No. 1 well, which gushed in 1914 and reeled in investors and speculators from miles around. [Read more](#) [Thanks to Don Johnston of ISCO Associate Member, DG & Hazmat Group for providing the link to this story]

JAPANESE CHEMIST DEVELOPS POWDER THAT CAN CLEAN FUKUSHIMA WATER

[French nuclear engineering company Areva SA will lend its services to treat the pools of radioactive water at the troubled Fukushima Daiichi nuclear power plant](#), lifting a crucial obstacle hindering repair efforts. But a Japanese chemist claims he has developed a powder substance in less than a month that he says could decontaminate the toxic water 20 times faster than the French method, thereby significantly accelerating progress toward the ultimate goal of cold shutdown.



In the picture: A worker wearing protective suit points at his rubber boots to show the level of water being submerged at the second basement floor of the crippled Fukushima Daiichi nuclear power plant on April 8.

Tomihisa Ohta, a professor at Kanazawa University's graduate school of natural science and technology, says his white powder, made up of an assortment of natural minerals and chemicals, would essentially capture the radioactive materials from the contaminated water in a process that could treat 1,000 tons of water in an hour. Areva's treatment system can remove radioactive material from 50 tons of water an hour.

"It's just that we're using an extremely fast method," said Mr. Ohta in an interview with JRT Wednesday. "The precipitation speed is different." Mr. Ohta said he developed his technology in conjunction with Kumaken Kougyou Co., a pollution cleanup company in Akita Prefecture. Kumaken Kougyou has been using powder developed by Mr. Ohta developed since about 2008. The company confirmed its links with Mr. Ohta, leaving the chemist to take the lead in discussing the new project.



Picture: The powder developed by chemist Tomihisa Ohta and Kumaken Kougyou Co.

Mr. Ohta said he reached out to Fukushima Daiichi operator Tepco and the government about a week ago when he finished developing the radioactive bent powder. Discussions are ongoing, he said. Relevant Tepco and government officials couldn't immediately be reached for comment.

Mr. Ohta attributes the gap to different chemical structures, but said he cannot speculate further since he doesn't know specifics about Areva's process. Mr. Ohta's technology has been tested in experiments, but as yet has not been used in industrial applications.



Picture: A beaker of water with a mixture of iodine and cesium during a water decontamination experiment conducted by Tomihisa Ohta and Kumaken Kougyou Co.

In Mr. Ohta's version, once the radioactive material is captured it then precipitates, drawing the irradiated parts out from the water, which then fall into a murky pile at the bottom of a container leaving the rest of the liquid clear much like an undisturbed snow globe. In experiments, scientists added 15 milligrams of powder to 100 milliliters of water steeped in non-radioactive cesium that had been dissolved at a density of 1-10 parts per million. (The densities of radioactive substances at Fukushima Daiichi are estimated at about 10 ppm; Mr. Ohta said the powder can handle densities as high as 100 ppm.) The purification process was completed 10 minutes later, according to Mr. Ohta, adding that the process would not take much longer than 10 minutes even if treating thousands of tons of water at a time. "Almost 100% of radioactivity will be removed (from the water)," said Mr. Ohta.



Picture: Ten minutes after the powder was stirred into the water mixture and captured the cesium and iodine substances.

Mr. Ohta said the substance could be used to help cleanup efforts at Fukushima Daiichi immediately as soon as several water treatment facilities are built like the unit being erected by Areva. Researchers did not use radioactive substances in the experiment, but Mr. Ohta said he's confident the powder would produce the same results regardless because the chemical properties are the same.

The powder's DNA was completed very quickly – in under a month. The base is modeled after a similar powder that decontaminates water laced with industrial and metallic pollutants, usually found near factories. Mr. Ohta tweaked the original prescription, which he began to devise six years ago, targeted towards heavy metals like magnesium, iron and cobalt, so the chemical components complemented radioactive isotopes iodine, cesium, strontium and plutonium. The chemist declined to disclose the exact composition due to patent reasons, but said the material is easy to obtain and rich in supply. [Read more](#)

Technology (continued)

POTENTIAL ALTERNATIVE TO OIL DISPERSANT UNDER DEVELOPMENT

A researcher at the University of Southern Mississippi is developing a two-step response kit for oil rigs and marine vessels to keep on board in case of an oil spill.

Robert Lochhead has developed many of the polymers, or large molecules, that perform important tasks in consumer goods - such as the ingredient that keeps conditioning shampoo from re-depositing dirt onto hair during the rinse.

The polymer not only disperses oil, making it degrade faster, but also keeps oil from sticking to natural materials -- such as feathers, grasses and sand. Less further along in development is the first step in his two-part kit: a mile-long, reusable polymer sheet to soak up oil.

"There are thousands of tons of oil spilled in U.S. waters every year, and what we're hoping is that the emulsifier and the sheet would be almost like a fire extinguisher on every vessel, on every oil rig, so as soon as you get an oil spill, you mop the top," Lochhead said. "And what you can't mop up, you emulsify so that it doesn't stick to anything."

A polymer is a large compound with repeating units of two or more ingredients. Lochhead can't say exactly what his new polymers are made of yet, since he hasn't filed patents.

"The material is not only biodegradable, it's edible," Lochhead said. "Soy lecithin, for example, is an emulsifier in chocolate."

Materials such as hair and feathers are excellent materials for oil containment booms because they soak up oil. Dispersants actually increase that quality, Lochhead said.

His emulsifier not only speeds up natural degradation, like other dispersants do, but also makes feathers resistant to oil.

"The birds can sit inside the emulsion, come back up, flap their wings and it falls off," said Lochhead. "And they fly away."

He said the material is three to five years away from reaching the market.

He wants to optimize it so that less needs to be used and it can be sprayed from aircraft.

It must also undergo environmental testing to gain Environmental Protection Agency approval. [Read more](#)

Events

Events are listed here as soon as possible after they are notified to ISCO and will usually only be featured once in this column. To find a more comprehensive listing of upcoming events, including ones previously announced in this column, click [HERE](#)

UK: IMPROVING SAFETY IN PETROLEUM STORAGE FACILITIES AND DISTRIBUTION OPERATIONS

Coventry, 26 May, 2011 - This event aims to promote and disseminate key developments and changes in industry good practice, in the fields of distribution, storage facilities, safety operations, and regulatory compliance. Essential information will be provided for safety, health, environment and engineering disciplines, with key industry speakers offering expert views on recent developments. This event is useful for all those involved in the management and operation of petroleum storage and distribution facilities and systems.

Confirmed Speakers: Chaired by Alec O'Beirne FEI, Director, JOB Training and Consultants ■ Daniel Brain, Senior Terminal Manager, Murphy Oil *Development of CDOIF guideline terminal loading operations hazard awareness* ■ Peter Davidson, Process Safety Programme Manager, UKPIA *A commitment to process safety* ■ Graeme Ellis, Principal Safety Consultant, ABB Engineering Services *Using performance indicators to drive improvement in process safety performance* ■ Nicola Eury, Principal, Environ *Environmental Damage Regulations - minimising liability by establishing an ecological baseline and incorporating into site-based environmental management systems* ■ Robert Harris, AEC, Secretary SLPS Committee *UK Safe Loading Pass Scheme – a terminal safety management system* ■ Simon Neale, Senior Project Engineer, Resource Protection International *Update to EI Model code of safe practice Part 19: Fire precautions at petroleum refineries and bulk storage installations* ■ John Pond MEI, EI Process Safety Survey *EI Guidance on a framework for high-level process safety management* ■ Ian Travers, Head of Chemical Industries Strategy Unit, HSE Hazardous Installations Directorate *Be part of the solution: Strategy for health and safety one year on.* [More info](#)

CHINA: SHANGHAI 6TH INTERNATIONAL PETROLEUM PETROCHEMICAL NATURAL GAS TECHNOLOGY EQUIPMENT EXHIBITION (SIPPE 2011)

Shanghai, 21-23 September, 2011 - The SIPPE is a focal project of the Shanghai Municipal Government and the China Council for the Promotion of International Trade (CCPIT). The exhibition is jointly hosted by the CCPIT Pudong Sub-Council, Shanghai Petroleum Society, and organized by Shanghai Aiexpo Exhibition Service Co., Ltd. Over the five years, with support from domestic and overseas enterprises, the SIPPE has grown in scale year by year, a cumulative total 1600 enterprises from over 30 countries and regions have participated in the exhibition, at the same time attracting over 45000 professional audiences from over 40 countries and regions, cumulative trade resulting from the show stands at \$1.5 billion USD. More info: info@sippe.org.cn



In this issue of the ISCO Newsletter we are printing No. 23 in a series of articles contributed by Dr Douglas Cormack.

Dr Douglas Cormack is an Honorary Member of ISCO. As the former Chief Scientist at the British Government's Marine Pollution Control Unit and head of the UK's first government agency, the Warren Spring Laboratory, Douglas is a well known and highly respected figure in the spill response community. He is the Chairman and a founder member of the [International Spill Accreditation Association](#)

KNOWLEDGE OF WATER-IMMISCIBLE SYSTEMS (CHAPTER 23)

While attempts had earlier been made to relate emulsion viscosity η to viscosity of the continuous phase η_c and the fractional content of the dispersed phase ϕ by equation 1: $\eta = \eta_c (1 + a\phi)$, a literature survey conducted by the WSL team found it to hold only for values of $\phi < 0.05$ with a remaining constant at 2.5, while attempts to gain agreement between observed and calculated for higher values of ϕ by introducing higher powers and additional coefficients had only limited success. Thus by replacing the $a\phi$ of equation 1, with $a\phi + b\phi^2 + c\phi^3 + \dots$, it was found that for a at 2.5, values of b ranged from 1.4 to 12.7 and values of c were again wide-ranging, though rarely used. However, for water-in-oil emulsions, the review valued a at 2.5 and b in the range 0 to 9.7. In contrast, the exponential equation $\eta = \eta_c e^{k\phi}$ has shown good agreement with measured values for Cold Lake and Epping crude oil emulsions for values of ϕ ranging from 0.01 to 0.40, though the viscosities of these emulsions were very shear-dependent at higher values of ϕ and had a tendency to break at shear rates of 100 s^{-1} . Thus, while evermore complicated expressions have been suggested for higher values of ϕ , the equation of Ackermann and Shen agrees well with the literature data survey up to $\phi = 0.50$, while that due to Frankel and Acrivos agrees with the data survey for $\phi > 0.50$, but shows deviation for $\phi < 0.50$.

Though the effort to produce a single equation to predict the viscosity of emulsions from the intrinsic viscosity of the continuous phase and the fractional water content has been only partially successful, it has produced further insights as to the difficulty of doing so. Thus, we suspect that the viscosity of the dispersed phase affects the measured viscosity of the emulsion by an interaction between the continuous and dispersed phases not accounted for by the considerations previously outlined; and that the droplet-size distribution plays a part, as do the presence and concentrations of the emulsifying agents, the nature and properties of the emulsifying film around the droplets, and the possible presence of hydrocolloids and particulate solids. To simplify matters, Cheng at WSL, suggested that for any given system a simple polynomial in the form $\eta/\eta_c = (1 + a\phi + b\phi^2 + \dots) / 1 - (\phi/\phi_{\max})^{1/3}$ is adequate, provided that the purpose is interpolation between measured values, that measurement of values is extended as needed, and that no extrapolation is attempted beyond the measured range.

As to interaction between the continuous and dispersed phases, Taylor as early as 1928 had suggested that the dispersed phase would behave as rigid spheres only when the diameter of the droplets was less than a critical size and he replaced the coefficient for a in equation 1 with $(\eta_d + 2/5 \eta_c) / (\eta_d + \eta_c)$ where η_d and η_c are the dispersed and continuous phase viscosities respectively. Clearly when the former is very much larger than the latter this expression reduces to equation 1. However, when they are similar, continuous external flow causes fluid circulation within the droplets which in turn reduces the flow distortion around them and thus the measured viscosity. Of course, this model assumes that any emulsifier film around the droplets will not isolate them from interaction with the external flow.

Further to the demonstration of droplet-size effects, Leviton and Leighton found no effect in the size range 0.7 to 3.0 μm in dilute water-in-oil emulsions while Thompson *et al* found that in the size ranges below 20 μm and below 40 μm for 20% and 50% water-in-oil emulsions respectively, the viscosity increased with decrease in droplet size but was independent of size above these ranges. However, an adsorbed film will increase droplet size at any size but will have the greatest effect the smaller the droplet and would thus be expected to increase viscosity as droplet size decreases. Again, Coulomb forces would be expected to increase viscosity at these lower sizes. Overall, however, emulsions are not uniform dispersions and so the mean droplet size d_m is a mean of the actual size distribution, making it possible to have the same d_m for different size distributions, thus confusing attempts to demonstrate size effects.

1 *The Rational Trinity: Imagination, Belief and Knowledge*, D.Cormack, Bright Pen 2010 available at www.authorsonline.co.uk

2 *Response to Oil and Chemical Marine Pollution*, D. Cormack, Applied Science Publishers, 1983.

3 *Response to Marine Oil Pollution - Review and Assessment*, Douglas Cormack, Kluwer Academic Publishers, 1999.

Publications

GUIDANCE ON ESTABLISHING A SPECIES AND HABITATS BASELINE FOR THE ENVIRONMENTAL DAMAGE/LIABILITY REGULATIONS 2009

The European Environmental Liabilities Directive (ELD) was implemented into UK law by the UK government and regional assemblies in 2009. The ELD primarily seeks to discourage the causing of environmental damage by applying stringent, and potentially costly, remedial measures to address such damage.

Guidance on establishing a species and habitats baseline for the Environmental Damage/Liability Regulations 2009, developed by the Energy Institute's Soil Waste and Groundwater Group, provides guidance on establishing a species and habitat baseline to assist sites to comply with the ELD.

The guidance is a practical handbook, enabling users to develop a species and habitats baseline, for areas on and around their facilities, helping to direct appropriate damage prevention efforts and to build reference information, against which any potential damage can be measured. While the guide is likely to be most useful to production and manufacturing sites, the principles and guidance are equally applicable to smaller sites with areas of interest being scaled accordingly. [More info](#)

GULF OIL SPILL REDUX: NINE BOOKS ON THE BP DISASTER

A year after millions of barrels of oil were spilled into the Gulf of Mexico from BP's Macondo well, much ink has been spilled on the "second draft" of history.

None of the nine books (and counting) published thus far manages to answer two of the biggest questions raised by the explosion of the Deepwater Horizon: Was the April 20, 2010, accident, which killed 11 oil rig crew members, the "worst environmental disaster in U.S. history," as many claimed, or was Tony Hayward right that the gulf is a "very big ocean" that could absorb the impact?

The best of them cut a course between those statements and cast the event in refreshing context. The rest succumb to polemics or hasty history. [View summary reviews](#)

Training

NEW HNS TRAINING MANUAL ISSUED BY MERRAC

MERRAC, the Marine Environmental Emergency Preparedness and Response Regional Activity Centre, is one of four Regional Activity Centres of the Northwest Pacific Action Plan (NOWPAP) which was adopted in 1994 as a Regional Seas Programme of the United Nations Environment Programme (UNEP) by the People's Republic of China, Japan, Republic of Korea, and Russian Federation. MERRAC is responsible for regional co-operation on marine pollution preparedness and response in the region.

This Manual deals with incidents involving Hazardous and Noxious Substances (HNS) and aims to explain about training course for the purpose of giving sufficient preparedness for and response to marine Hazardous Noxious Substance (HNS) incidents to the participating trainees.

First published in 2011 by Marine Environmental Emergency Preparedness and Response Regional Activity Centre the Northwest Pacific Action Plan (NOWPAP MERRAC) P.O.Box 23, Yuseong, Daejeon 305-600, Republic of Korea.

[Download the manual](#) N.B. This is a large file – 13.01 MB

Contracts and tenders

EUROPEAN MARITIME SAFETY AGENCY

Invitation to tender for supply of oil pollution response equipment, PIN 2011/S 55-089115. [More info](#)

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