



# ISCO NEWSLETTER

The Newsletter of the International Spill Response Community

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## International news

### MPA AND ITOPF RENEW PIONEERING AGREEMENT TO EXPEDITE OIL SPILL COMPENSATION CLAIMS

The Maritime and Port Authority of Singapore (MPA) and the International Tanker Owners Pollution Federation Limited (ITOPF) renewed a Memorandum of Understanding (MOU) on 10 April aimed at expediting the processing of oil spill compensation claims.

The MOU on Oil Spill Resources was first signed in 2007 and Singapore was the first country in the world to establish such an agreement that covered a pre-agreed schedule of rates for oil spill response resources. The agreement was supported by the International Group of P&I Clubs and the International Oil Pollution Compensation Fund. In addition to establishing a pre-agreed schedule of rates to expedite claims settlements, the MOU helped ensure necessary resources were available to handle oil spills. As part of the renewal, the schedule of rates were reviewed and updated based on current market conditions.

Mr Cheong Keng Soon, MPA's Director (Port), said "The pre-agreed schedule of rates, as a result of the MOU, has come in useful during the post-incident claims and compensation process. The MOU is testimony to the close partnership forged between MPA and industry players in combating any oil spills and protecting the marine environment."

Richard Johnson, Technical Director of ITOPF commented that "The MOU has proven successful in expediting compensation payment for the benefit of all involved parties. Having pre-agreed rates at the time of a spill is extremely helpful and it is most pleasing that the MPA and ITOPF have worked closely to keep the initiative alive and up to date. The MOU, along with arrangements whereby ITOPF is usually invited to work alongside MPA in order to offer advice and assistance during an incident, is a good example of industry/government co-operation."

The renewal of the MOU was signed by MPA's Director (Port) Mr Cheong Keng Soon and ITOPF's Technical Director Richard Johnson during the opening of the International Chemical and Oil Pollution Conference and Exhibition (ICOPCE) 2013. [Source: ITOPF News]

## Incident reports

### JAPAN: FUKUSHIMA LEAKING RADIOACTIVE WATER

April 11 - Japan's crippled Fukushima nuclear power plant has faced a series of radioactive water leaks.

At least three of the facility's seven underground storage pools were discovered to be seeping thousands of gallons of radioactive water into the soil, The New York Times reported Wednesday. *TerraDaily* [Read more](#)

#### Fukushima plant abandoning leaky underground pools

April 10 - The operator of Japan's crippled Fukushima nuclear power plant said Wednesday it will abandon seven underground reservoirs storing radioactive water after three of them sprang leaks.

The contaminated water will be transferred to more reliable containers on the ground, possibly by early June, to avoid risks of further leaks, Tokyo Electric Power Co. (TEPCO) president Naomi Hirose told a news conference. *TerraDaily* [Read more](#)  
Links for other reports in [gCaptain](#) and [The Asahi Shimbun](#)

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### USA: MORE ON THE MAYFLOWER, ARKANSAS PIPELINE SPILL



#### Exxon oil spill could be 40% larger than company estimates, EPA figures show

April 5 - If EPA's highest number of 7,000 barrels turns out to be correct, the Ark. spill would be roughly a third the size of Michigan's 2010 dilbit disaster. *Inside Climate News* [Read more](#)

#### Exxon oil spill clean-up in path of severe weather, maybe a tornado

April 9 - As the weather turns nasty, Exxon spent part of Tuesday deploying additional boom to prevent oil from moving further towards the main body of Lake Conway. *Inside Climate News* [Read more](#)

#### Oil from Exxon spill in Arkansas flowing into wetlands

April 11 - The ExxonMobil oil spill in Mayflower, Arkansas is getting worse: more than a week after Canadian tar sands erupted from a pipeline, residents of the small town say area wetlands are becoming polluted with the crude. *RT.com* [Read more](#)

#### Exxon's 22-foot rupture illustrates tremendous operating pressure of oil pipelines

April 12 - The rupture in the ExxonMobil pipeline that sent a river of oil through a suburban neighborhood in Mayflower, Ark. is now known to be 22 feet long and 2 inches wide. That's almost four times longer than the six-foot pipeline tear that sent more than one million gallons of Canadian dilbit into Michigan's Kalamazoo River in 2010. *Inside Climate News* [Read more](#)

#### Insight: Mayflower, meet Exxon: When oil spilled in an Arkansas town

April 11 - Warren Andrews had just finished putting up balloons for his stepdaughter's 18th birthday party at their suburban home in Mayflower, Arkansas, when his wife came inside and said something was wrong. After stepping out of his house, and taking one glance, he immediately dialed 911. "I don't know what's going on, but I've got a river of oil coming down the street at me," Andrews told the operator.

Five minutes later, the slick of noxious black crude spewing from a ruptured Exxon Mobil pipeline was eight feet wide, six inches deep and growing fast. Within half an hour, a representative from Exxon Mobil Corp was on the scene. By the next day, Exxon's agents had contacted the evacuated residents and were writing checks for their living expenses. *Reuters* [Read more](#) [Thanks to Gerald Graham, World Ocean Consulting]

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### BRAZIL OIL LEAK CLEANING EFFORTS WRAPPING UP

April 8 - Workers on Sunday nearly finished cleaning up a handful of beaches drenched by marine fuel after a small spill off the coast of the Brazilian state of Sao Paulo, port authorities said. The leak at the Almirante Barroso marine terminal in the port of Sao Sebastiao was controlled on Friday, according to the terminal operator Transpetro, the transportation arm of state-run oil giant Petrobras. *The Maritime Executive* [Read more](#)

#### Petrobras fined \$5m for spill

April 10 - Brazil's state-run energy giant Petrobras has been ordered to pay a fine of \$5-million over an oil spill that fouled several beaches along Sao Paulo state's coast, authorities said Monday. *lafrica.com* [Read more](#)

## Incident reports (continued)

### AUSTRALIA: ATSB TO EXAMINE CHEMICAL SPILL

THE derailment of a train carrying dangerous goods near Colebrook will be investigated by the Australian Transport Safety Bureau. Tasmania Fire Service crews spent today cleaning up after the chemical spill near the southern Tasmanian town. *The Mercury* [Read more](#)

### OMAN: SHIP SANK OFF OMAN COAST WITH 150 TONNES OF BUNKER FUEL ON BOARD

April 9 - Turkish bulk carrier *Atlantik Confidence*, that sank off the coast of Oman last week, had about 150 tonnes of bunker fuel on board, *the Oman Daily Observer* reports. Oman is monitoring the area and has seen no signs of a leak so far. *EMEA News* [Read more](#)

### CANADA: SUNCOR SPILLS OIL PRODUCT AT BURREARD TERMINAL, BRITISH COLUMBIA

April 12 - A spill of 225 barrels of a biodegradable fuel from a storage tank at Suncor Energy Inc's Burrard Products Terminal in Port Moody, British Columbia, was discovered last Saturday, the company said. *The Maritime Executive* [Read more](#)

### PHILIPPINES: COAST GUARD TO SIPHON FUEL FROM GROUNDED CHINESE VESSEL IN TUBBATAHA

April 10 - The Philippine Coast Guard on Wednesday mapped out plans to siphon the fuel from a Chinese fishing boat that ran aground in Tubbataha Reef before midnight Monday. Coast Guard spokesman Lt. Cmdr. Armand Balilo said this aims to prevent the possibility of fuel spilling from the vessel and polluting the area, radio dzBB's Carlo Mateo reported. *GMA News* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

### UK: 'STICKY SUBSTANCE' BIRDS RESCUED IN DEVON AND CORNWALL

April 11 - Nearly 40 birds covered in a sticky substance have been washed up on the south coast of Cornwall and Devon.

Guillemots have been found on beaches from Mevagissey in Cornwall to Kingsbridge in Devon. Twelve were found on Wednesday, 27 on Thursday, and more were expected on further high tides, the RSPCA said. The charity said the birds were covered in "what appears to be the same white substance" that killed hundreds of birds in February. *BBC News* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

## Other news

### USA: SIGNIFICANT PIPELINE FAILURES INVOLVING THE TRANSPORT OF HAZARDOUS LIQUIDS: 1993-2012

April 8 - Between the ongoing saga of the Keystone XL, the Exxon Pegasus spill in Arkansas, and the Royal Dutch Shell spill near Houston, pipelines have been in the news a lot lately.

Yet, despite the coverage, the obvious damage, claims and counter-claims, it's difficult to understand these events in the overall context of pipeline safety without looking at longer time frames. Fortunately, the [Pipeline and Hazardous Materials Safety Administration](#) (PHMSA) maintains a comprehensive database of all pipeline incidents reported in the U.S.

Using data from 1993-2012, we focused on onshore and offshore pipelines carrying hazardous liquids (primarily crude oil and refined petroleum products) that suffered what PHMSA classifies as "significant incidents." To qualify, a "significant incident" must satisfy one or more of the following criteria:

- a fatality or injury requiring in-patient hospitalization;
- \$50,000 or more in total costs, measured in 1984 dollars;
- highly volatile liquid releases of 5 barrels or more, or other liquid releases of 50 barrels or more;
- liquid releases resulting in an unintentional fire or explosion.

Of 5,727 reported incidents during 1993-2012, 2,079 met the PHMSA definition of "significant incidents," accounting for 99.4% of the total volume spilled. *Ecology Today* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]



## USA: REPORT CALLS FOR NEW US ARCTIC OCEAN STRATEGY

April 6 - With the warming U.S. [Arctic](#) region poised for greater oil and mining development, the White House needs to develop a national strategy that can take environmental decisions on a larger scale, a report issued Thursday concluded.

The study recommends greater coordination between federal, state and local agencies to better manage resources in Alaska, said the U.S. Department of Interior's Alaska Interagency Working Group in its report that was presented to President [Barack Obama](#).

"It is imperative that we reduce redundancies and streamline federal efforts as we safely and responsibly explore and develop Alaska's vast resources while preserving the region's rich ecosystems," David Hayes, the deputy interior secretary and working group chairman said in a statement.

The study's release follows a trouble-plagued offshore [Arctic](#) drilling season conducted by [Royal Dutch Shell](#), and comes as several other energy, mining and shipping companies are poised to do [business](#) in the region. [gCaptain](#) [Read more](#)

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## RUSSIA SEEKS BALTIC POLLUTION PARTNERSHIPS

April 5 - Russia's push to create public-private partnerships as a way to help clean up the polluted Baltic Sea is the focus of an environmental summit in St. Petersburg.

The meeting, to be attended by Russian Prime Minister Dmitry Medvedev and premiers from 10 other Baltic and northern European nations, is being called in part to strengthen international cooperation on tackling the chronic environmental woes of the Baltic, which is plagued by nitrates and phosphates from waste run-off. [TerraDaily](#) [Read more](#)

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## USA: JUDGE REJECTS BP BID TO BLOCK GULF SPILL PAYOUTS

April 5 - BP's request to block settlement payouts associated with the 2010 Gulf of Mexico oil spill was rejected Friday by a federal judge. BP estimated a year ago that it would spend roughly \$7.8 billion to resolve tens of thousands of claims by businesses and individuals covered by the settlement.

BP argued that Juneau made decisions in January that expose the company to fictitious losses that were never contemplated in the settlement. [Christian Science Monitor](#) [Read more](#)

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## NIGERIA: \$11.5B BONGA OIL SPILL FINE SPURS REPS EFFORT TO SAVE SHELL

April 9 - The House of Representatives is in the process of mediating in a rift between two regulatory bodies government and Shell Nigeria Exploration and Production Company (SNEPCO), over allegation of duplication and excessive fine for the oil spill that occurred in the Bonga field off the coast of Delta and Bayelsa States. Adesuwa Tsan gives insight into the events that led to lawmaker's intervention.

Lawmakers in the green chamber last week resolved to examine the yardstick used by the National Oil Spill Detection and Response Agency (NOSDRA) and the Nigeria Maritime Administration and Safety Management Agency (NIMASA), to arrive at \$11 billion fine imposed on Shell Nigeria Exploration and Production Company (SNEPCO), in December 2011. [Leadership](#) [Read more](#)

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## USA: EXXONMOBIL PLANS APPEAL OF \$236 MILLION JURY AWARD IN LANDMARK MTBE CASE

April 9 - A New Hampshire jury took less than two hours Tuesday to find ExxonMobil liable for widespread groundwater contamination in the state, and ordered the company to pay \$236 million for groundwater testing and cleanup.

The verdict ended a landmark product liability trial that began in mid-January and involved powerhouse lawyers — one team representing one of the country's largest corporations, another hired by New Hampshire to bring the case.

The case, which involved the gasoline additive MTBE, was the longest in Merrimack County Superior Court history, and the verdict was the largest ever won by the state, outgoing Attorney General Michael Delaney said. [Union Leader](#) [Read more](#)

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## NIGERIA: SHELL WARNS OF ENVIRONMENTAL COST OF OIL THEFT IN NIGER DELTA

April 11 - Rising incidences of oil theft in Nigeria's oil producing Niger Delta come at a significant environmental cost, Royal Dutch Shell PLC (RDSB) said Thursday. In its sustainability report, the Anglo-Dutch oil major said its Nigerian unit, Shell Petroleum Development Company, or SPDC, experienced 137 spills as a result of sabotage and theft last year, with the volume of oil lost amounting to 3.3 thousand tons. [The Wall Street Journal](#) [Read more](#) [Subscription required]

## Other news (continued)

### **NIGERIAN CHILDREN SUFFERING IN LEAD POISONING CRISIS**

April 12 - A BBC investigation has revealed the level of toxic lead contamination around a cluster of villagers in Zamfara province in Northern Nigeria.

In the past four years 450 children have died from lead poisoning in the area. The lead is used to help extract gold from local mines. Medical charity Medecins Sans Frontieres (MSF) has accused the Nigerian government of a slow and ineffective response to the contamination. The government denies the accusation. *BBC News* [View the short video](#) [Thanks to David of ISCO Industry Partner, DG & Hazmat Group]

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### **USA: KILLING KEYSTONE COULD RISK MORE OIL SPILLS BY RAIL**

April 10 - A rejection of the Keystone XL pipeline by President Barack Obama would push more of Canada's \$73 billion oil exports onto trains, which register almost three times more spills than pipelines.

The March 29 [rupture of an Exxon Mobil Corp. oil pipeline in Mayflower, Arkansas](#), provided the latest evidence for opponents citing the risk of environmental contamination in their efforts to scuttle the Keystone XL project, an almost 2,000-mile pipeline linking Alberta's oil sands with the world's largest refining market on the U.S. Gulf Coast. The alternative, hauling crude by rail, may be worse, said Charles Ebinger, director of the Brookings Institution's energy security initiative. *FuelFix* [Read more](#)

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### **USA: STATES ARE SERIOUS ABOUT OIL SPILL REPORTING**

Most regulated facilities know that they must report oil spills to the National Response Center immediately, but what confuses most owner/operators are the oil spill reporting requirements imposed by the states. *Environmental Daily Advisor* [Read more](#)

[Editor: The link to this article was sent in by Marc K. Shaye Hon.FISCO, Member of the ISCO Executive Committee. Under the Massachusetts Contingency Planning (MCP) requirements, notification thresholds have been established for 2-hour, 72-hour, and 120-day-type releases. If you need to know about these reporting requirements you should read this article]

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### **AUSTRALIA (SPILLCON): BOX SHIP CARGOES PRESENT INCREASING THREAT TO LIFE**

April 11 - Cargoes that are hazardous and noxious substances (HNS) carried by boxships are presenting an increasing risk of harm to people, several expert speakers have told the SpillCon event currently under way in Cairns. *Lloyds List* [Read more](#) [Subscription required]

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### **AUSTRALIA (SPILLCON): ENVIRONMENTALISTS FEAR INCREASED REEF OIL SPILL THREAT**

April 12 - Conservationists say growth in shipping on the Great Barrier Reef off Queensland is increasing the risk of a major oil spill.

An international conference in Cairns in the state's far north has this week been discussing oil spills, as experts predict shipping on the reef could double in coming years.

About 8,000 carriers move through the World Heritage area each year. Anna McGuire from the Cairns and Far North Environment Centre says the threat is not being treated seriously enough.

"Our main concern is the rapid industrialisation of the coastline, so things like the Abbot Point coal terminal expansion project and others all the way up the coastline," she said. *ABC News* [Read more](#)

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### **CANADA: ROB POWELL – “SINKING THE MYTH OF FLOATING BITUMEN IN SEAWATER”**

April 11 - On April 20, 2010, the Deepwater Horizon platform exploded and sank in the Gulf of Mexico, spilling almost five million barrels of oil into the ocean. In spite of a massive cleanup effort, oil continues to foul the sea floor and emerge during storms to foul golf beaches. The damage to marine food chains and the people who depend on them is ongoing.

The anniversary of the BP spill serves as a grim reminder that very little can be done to recover oil when it's spilled in the marine environment. Recent amendments to federal shipping legislation to improve oil spill prevention don't alter the stubborn fact that more than 90 percent of oil spilled by tankers at sea is never recovered. And oils such as bitumen, proposed for transport by the [Northern Gateway pipeline](#), can submerge, making them impossible to find, much less recover.

The federal government is floating myth, not science, when it assures the public that diluted bitumen will float. Recalling the 2007 Kinder Morgan oil spill in Burnaby, Natural Resources Minister Joe Oliver [told](#) the Business Council of B.C. in November that crews

## Other news (continued)

“put out an oil boom and laid down absorbent cloth under the spill site attached to lobster traps [sic]. Following the cleanup, they recovered the cloth and no oil had sunk. So we know, in that instance, dilbit floated.”

It's a shame to wreck a good story with facts. But given the risk to B.C.'s marine environment, it's important to consider the real science behind diluted bitumen (dilbit). The oil spilled that day wasn't dilbit. It was Albian Heavy Crude Oil, a blend of synthetic crude and heavier oil (aka synbit). Trying to understand what dilbit might do in the sea by reviewing the Burnaby spill is akin to studying the black box data from the wrong plane crash.

Enbridge, for its part, is providing the public with an incomplete picture of the actual risk associated with diluted bitumen. Its website states "...crude oils, including diluted bitumen, are less dense than water and therefore float." There is some truth to this—just not enough to withstand the scrutiny of a reasonable person armed with the facts. [Straight.com](#) [Read more](#) [Thanks to Gerald Graham of World Ocean Consulting]

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## UK & FRANCE: NUCLEAR WASTE BARRELS LITTER ENGLISH CHANNEL



Picture: An intact barrel of radioactive waste found just kilometers off the French coastline by SWR.

April 12 - German journalists have discovered barrels of radioactive waste on the floor of the English Channel, just a handful of thousands dumped there decades ago. It was previously thought the material had dissipated. Now politicians are calling for the removal of the potentially harmful containers.

Some 28,500 containers of radioactive waste were dropped into the English Channel between 1950 and 1963. Experts have assumed that the containers had long since rusted open, spreading the radioactivity throughout the ocean and thus rendering it innocuous. But a new investigative report from the joint French-German public broadcaster ARTE has

concluded that the waste is still intact at the bottom of the sea.

As part of an investigative report set to air on April 23, affiliated German public broadcaster SWR sent an unmanned, remote-controlled submarine into the canal's depths, where they discovered two nuclear waste barrels at a depth of 124 meters (406 feet) just kilometers from the French coast.

Jettisoned by both the British and the Belgians, the containers hold some of the estimated 17,224 metric tons of low-level radioactive waste dumped in the English Channel's underwater valley known as Hurd's Deep, just north of the isle of Alderney, according to the International Atomic Energy Agency (IAEA). [Spiegel Online](#) [Read more](#)

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## ISCO news

### ISCO'S 2013 AGM HELD DURING SPILLCON CONFERENCE IN AUSTRALIA



Picture: A few of the AGM attendees in discussion at the meeting

ISCO Membership Director, Mary Ann Dalglish has written to say that the meeting was well attended with a particularly good representation from our Australian members. Other who attended included representatives from USA, Canada, UK, UAE and Saudi Arabia.

The meeting was chaired by ISCO President, David Usher Hon.FISCO and the Guest Speaker was Mr John Wardrop, Member of ISCO Council for Australia.

A fuller report on the meeting will be published in next week's issue of the ISCO Newsletter.



In this issue of the ISCO Newsletter we are printing No. 122 in a series of articles contributed by Dr Douglas Cormack.

Dr Douglas Cormack is an Honorary Fellow 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](#)

## CHAPTER 122: KNOWLEDGE AND COUNTER-BELIEF

Article 121 having shown how knowledge is definitively differentiated from belief in general and in particular, this article now provides a few more relevant particulars. Thus, we can see that belief in the permanent toxicity of released oils/HNS can now be differentiated from our knowledge that all organic material which constitutes the biomass of all land and marine ecosystems is recycled by photosynthesis and biodegradation from and to carbon dioxide; that the biological carbon dioxide cycle of land-based ecosystems continuously introduces intermediate degradation products to the marine ecosystem by river run-off and atmospheric rainout; that the greater proportion is continuously produced by the marine ecosystem itself; that this moves back up the food chain, sinks to sustain food chains at greater depth or returns to surface waters by the up-welling which makes continental-shelf waters more productive than ocean waters; and that, consequently, no such product is toxic. More particularly, we know that primary marine production arises from carbon dioxide by photosynthesis in the light-penetrating euphotic zone where phytoplankton species undertake the role of land plants; that chemosynthetic bacteria synthesise organic molecules from carbon dioxide by energy derived from oxidation of such as the ammonium ion, molecular hydrogen or hydrogen sulphide instead of from photons; that heterotrophic bacteria use preformed organic molecules as food-sources in the secondary production of the marine ecosystem which extends from the euphotic zone to the seabed thousands of metres below it and ranges from bacteria to blue whales; and that unutilised food sources sequestered from the cycle of synthesis/biodegradation/ are fossilised to natural gas, petroleum and coal.

Thus, given the dependence of heterotrophic bacteria on pre-existing organic material, we should not be surprised by our knowledge that such are capable of utilising petroleum components and organic HNS, the precursors of which would have been part of the food-source during their pre-fossilisation passage to the seabed; that the populations of such heterotrophic species at the bottom of the marine food-chain/ ecological system are proportionate to the standing concentrations of oil runoff from land, incident-related releases, and natural petroleum seepage; and that these are the organism types which bio-remediate contaminated sites on land. Again, while natural seeps and other releases expose organisms to a wider range of hydrocarbon classes and homologues within each class than are present in their food-source precursors, and while low molecular weight hydrocarbons and aromatics of petroleum origin could be respectively narcotic and toxic subject to exposure concentrations, we know that both are rapidly lost by evaporation prior to photolytic degradation to carbon dioxide in the atmosphere; that while higher molecular weight poly-nuclear aromatic compounds (PNAH) are not evaporated, those which are absorbed by filter-feeders are rapidly excreted unchanged or as recognisable metabolites with removal of taint on exposure to clean water prior to sale; that free-swimming fish do not acquire taint unless surface-contaminated by being drawn in nets through floating slicks; and that all organic compounds, pre- or post-fossilisation, degrade to carbon dioxide and water when exposed to natural oxygen concentrations whether or not directly utilised as food-sources in ecological systems.

Again, further to exposure concentrations, we know that floating oils/HNS spread to a layer thickness of ~ 0.1 mm before their rates of evaporation, dispersion or solution have any significant effect on released volumes; that were such layers then to evaporate, disperse or dissolve instantaneously, the concentration in the bottom metre of the atmosphere or the top metre of the water column could not be more than 100ppm; that rates of evaporation, dispersion and dilution being less than instantaneous if not vastly less, the bottom and top metre concentrations are always less than 100ppm and continue to dilute though the ppb range effectively to zero in their respective columns of atmosphere and seawater. Yet again, we know that the surface-proximate concentrations arising from floating layers of oils/HNS or from more compact non-spreading volumes of individual HNS are never more than their saturated vapour or their saturated solution concentrations; and that such concentrations subsequently dilute and degrade within their respective columns, though such dilution is constrained for releases in confined spaces onboard ship and thus require particular attention in the salvage aspect of incident response.

As to time-dependent human exposure concentrations above floating slicks in ship-borne response operations, we know that all oil components and individual HNS with boiling points  $\leq 150^{\circ}\text{C}$  or  $\leq 250^{\circ}\text{C}$  evaporate totally from layer thickness of 0.1 mm in respectively 1 or 5 hours despite non-volatile oil components forming water-in-oil emulsions in the meantime; that 0.1mm and 1.0 layers of the single compound nonane would entirely evaporate in 3 or 30 minutes; that while vapours from oil slicks containing nonane as a natural component would burn when ignited, explosions are possible only in confined spaces onboard casualties; but that the latter can be avoided by direct measurement of space constrained concentrations with respect to the relevant upper and lower explosion limits.

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

## RESPONSE TO INLAND OIL SPILLS – PART 16

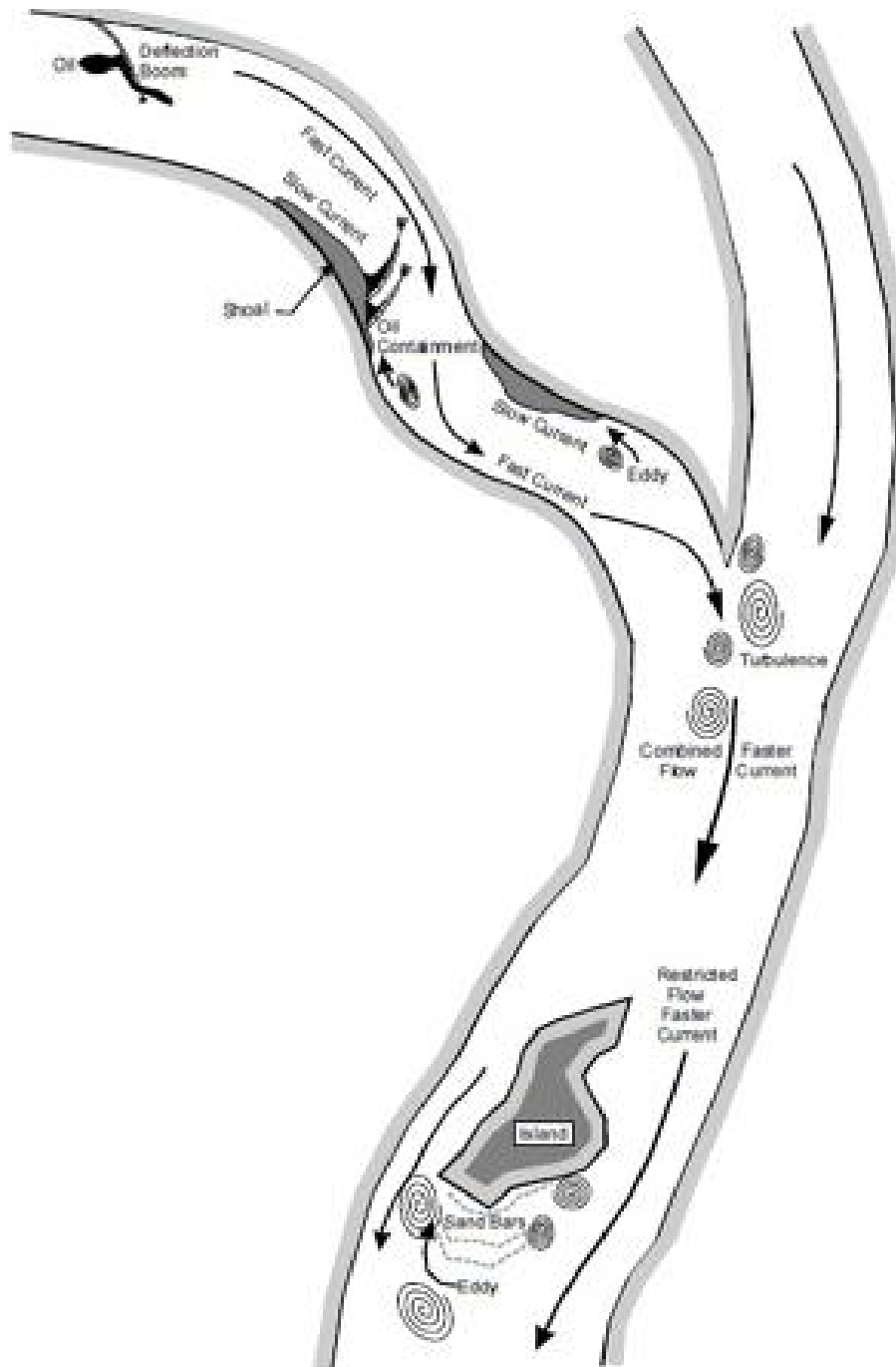


**A short series of articles contributed by Mark Francis of Oil Spill Solutions.**

Mark Francis has been involved with the oil industry since 1975. He attended his first oil spill in 1976, the Tanker Elaine V incident. He became head of response for inland spills within the UK for British Petroleum E & P in 1980 for 10 years responding to well, storage tank and pipeline spills throughout the UK. Over the next 20 years he continued to build his international operations experience and has also specialised in spill response training, delivering IMO and other courses in more than 20 countries. Mark's website is at <http://www.oilspillsolutions.org>

### Rivers (continued)

Below is a diagram showing many of the natural problems we find in rivers.





## Special feature - Inland spills (continued)

Meandering rivers always have faster currents on the outside of a bend, this is where the erosion is being done.

So when looking for boom collection points we need to be on the inside of the bend.

As in the diagram *right* deflection booms are positioned to deflect the oil to the inside where it will be recovered.

It is always advisable to position at least two collection booms as oil usually finds its way past the first one. Make sure the distance between the booms allow for the oil resurfacing.

I have been doing it this way since I got involved in this business and have taught people all over the world to do it this way.

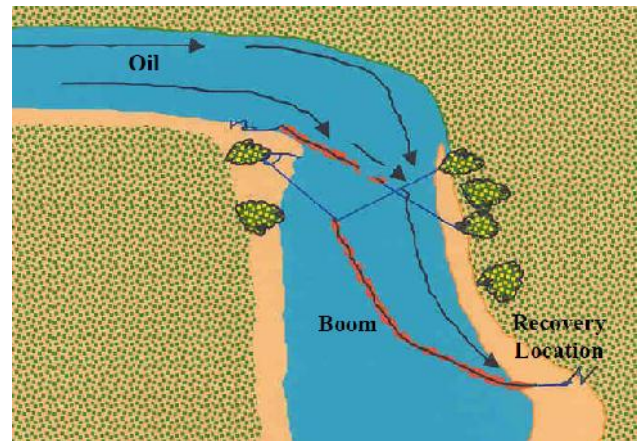
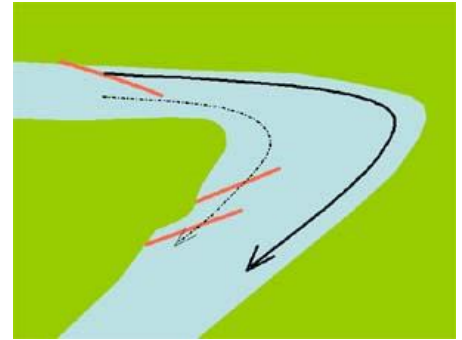
So why do we find the diagram *right* in a guide showing how to do it wrong.

Maybe it was done this way because that was where the trees were growing.

*Note in some countries it is illegal to tie booms or any other equipment off to trees.*

There are different schools of thought. Train both ways and decide which is right.

*Below Left* shows how to do it wrong as well.



- 1. Access from the road is where the smallest amount of oil is along with the fastest current.
- 2. Vessels on the side of the boom with the oil (more fumes and unnecessary contamination).
- 3. Very little tank space on vessels and none on the river bank.

Access is always the main problem, having enough time to position the booms before the oil arrives is obviously the aim.

The next access point downstream may be only 1 kilometer by river, we cannot always use the river e.g. too much equipment for the boat, no boat, too shallow etc.

By land it may be many kilometers of cart tracks and therefore too much time is spent to get there and position the equipment before the oil arrives.

When you find a good access point do the maximum possible to make sure the oil does not pass by.



Reconnoitre the next access point and even position equipment there if you have the manpower and extra equipment.

If there is a large quantity of spilt oil, the installation of many containment barriers will be needed. One single barrier will not block or deflect all the oil in moving water.

Water courses with currents of more than 1 meters per second (mps) bring more difficulties.

The distance between booms should be wide enough to let oil particles cross the first barrier and have enough time to float to the surface before reaching the next and so on.

The type of barriers to be used will be decided by local conditions and material availability.



**To be continued**

## IN SITU BURNING: CHAPTER 14



A short series of articles on In Situ Burning contributed by Dr Merv Fingas of Spill Science, Edmonton, Alberta, Canada T6W 1J6 [fingasmerv@shaw.ca](mailto:fingasmerv@shaw.ca)

Merv Fingas MSc PhD worked for more than 35 years in the field of oil spill technology at Environment Canada's Environmental Technology Center in Ottawa, Ontario. As head of the Emergencies Science Division at the Centre, he conducted and managed research and development projects. He is currently working independently in Alberta. Dr Fingas is the Member of ISCO Council for Canada.

### Summary of the Serial

This is the 14th of a series of articles on in-situ burning of oil spills. This series will cover in-situ burning step-by-step and will present the latest in knowledge on the topic.

### 14. Emissions – II

In the last episode, we reviewed the basics of oil burn emissions. It was noted that emissions include the smoke plume, particulate matter precipitating from the smoke plume, combustion gases, unburned hydrocarbons, organic compounds produced during the burning process and the residue left at the burning pool site.<sup>1</sup> In this episode, we shall push further and examine more classes of emissions.

**Volatile Organic Compounds (VOCs)** - Volatile organic compounds are organic compounds that have high enough vapour pressures to be gaseous at normal temperatures. When oil is burned, these compounds evaporate and are released. The emission of volatile compounds was measured at several test burns. One-hundred and forty-eight volatile organic compounds have been measured from fires and evaporating slicks. The concentrations of VOCs are relatively low in burns compared to an evaporating slick. Concentrations appear to be below human health levels of concern even very close to the fire. Concentrations appear to be highest at the ground [1.5 m (5 ft)] and are distributed exponentially downwind from the fire source. VOCs, although present, do not constitute a major human or environmental threat.

**Dioxins and Dibenzofurans** - Dioxins and dibenzofurans are highly toxic compounds often produced by burning chlorine-containing organic material. Particulates precipitated downwind and residue produced from several fires have been analyzed for dioxins and dibenzofurans. These toxic compounds were at background levels at many test fires, indicating no production by either crude or diesel fires.

**Carbonyls** - Oil burns produce low amounts of partially-oxidized material, sometimes referred to as carbonyls or by their main constituents, aldehydes (formaldehyde, acetaldehyde, etc.) or ketones (acetone, etc.). Carbonyls from crude oil fires are at very low concentrations and are well below health concern levels even close to the fire. Carbonyls from diesel fires are somewhat higher but also below concern levels. Burning of alcohol-containing fuels might result in the release of more carbonyls.

**Carbon Dioxide** - Carbon dioxide is the end result of combustion and is found in increased concentrations around a burn. Normal atmospheric levels are about 300 ppm and levels near a burn can be around 500 ppm, which presents no danger to humans. The three-dimensional distributions of carbon dioxide around a burn have been measured. Concentrations of carbon dioxide are highest at the 1 m level and fall to background levels at the 4 m level. Concentrations at ground level are as high as 10 times that in the plume and distribution along the ground is broader than for particulates.

**Carbon Monoxide** - Carbon monoxide levels are usually at or below the lowest detection levels of the instruments and thus do not pose any hazard to humans. The gas has only been measured when the burn appears to be inefficient, such as when water is sprayed into the fire. Carbon monoxide appears to be distributed in the same way as carbon dioxide.

**Sulphur Dioxide** - Sulphur dioxide, per se, is usually not detected at significant levels or sometimes not even at measurable levels in the area of an in-situ oil burn. Sulphuric acid, or sulphur dioxide that has reacted with water, is detected at fires and levels, although not of concern, appear to correspond to the sulphur content of the oil.

**Other Gases** - Attempts were made to measure oxides of nitrogen and other fixed gases. None were measured in about 10 experiments.

**Other Compounds** - There is a concern when burning crude oil about any "hidden" compounds that might be produced. In one study conducted several years ago, soot and residue samples were extracted and "totally" analyzed in various ways. While the study was not conclusive, no compounds of the several hundred identified were of serious environmental concern. The soot analysis revealed that the bulk of the material was carbon and that all other detectable compounds were present on this carbon matrix in abundances of parts-per-million or less. The most frequent compounds identified were aldehydes, ketones, esters, acetates, and acids, which are formed by incomplete oxygenation of the oil. Similar analysis of the residue shows that the same minority compounds are present at about the same levels. The bulk of the residue is unburned oil without some of the volatile components.



Figure 13 A remote-controlled helicopter emerges from a smoke plume during the Newfoundland Offshore Burn Experiment. Although the most important emissions are measured at ground (1.5 m) level, it is useful to compare these measurements to that in the smoke plume. Many compounds and gases are actually lower in the smoke plume, while the particulate levels (obviously) are very high in the smoke plume.

**References**

1. Fingas, M., "In-situ Burning", Chapter 23, in *Oil Spill Science and Technology*, M. Fingas, Editor, Gulf Publishing Company, NY, NY, pp. 737-903, 2011

**To be continued**

**Publications**

**FOR YOUR INTEREST – LINKS FOR RECENT ISSUES OF PERIODICALS**

|  |  |                  |
|--|--|------------------|
| <a href="#">ASME EED EHS Newsletter</a>              | News and commentary on HSE issues from George Holliday   | April 1 issue    |
| <a href="#">Bow Wave</a>                             | Sam Ignarski's Ezine on Marine & Transport Matters       | April 3 issue    |
| <a href="#">Cedre Newsletter</a>                     | News from Cedre in Brittany, France                      | March 2013 issue |
| <a href="#">The Essential Hazmat News</a>            | Alliance of Hazardous Materials Professionals            | March 4 issue    |
| <a href="#">USA EPA Tech Direct</a>                  | Remediation of contaminated soil and groundwater         | April 1 issue    |
| <a href="#">Intertanko Weekly News</a>               | International news for the oil tanker community          | No 15, 2013      |
| <a href="#">CROIERG Enews</a>                        | Canberra & Regions Oil Industry Emergency Response Group | April 2013 issue |
| <a href="#">Soil &amp; Groundwater Product Alert</a> | From Environmental Expert                                | April 1 issue    |
| <a href="#">Soil &amp; Groundwater Ezine</a>         | Articles, papers and reports                             | April 2013 issue |
| <a href="#">Soil &amp; Groundwater Newsletter</a>    | From Environmental Expert                                | April 11 issue   |
| <a href="#">Soil &amp; Groundwater Events</a>        | Upcoming events compiled by Environmental Expert         | March 2013 issue |
| <a href="#">Technology Innovation News Survey</a>    | From US EPA - Contaminated site decontamination          | Feb16-28 issue   |
| <a href="#">IMO Publishing News</a>                  | New and forthcoming IMO publications                     | March 2013 issue |
| <a href="#">Pollution Online Newsletter</a>          | News for prevention & control professionals              | March 27 issue   |
| <a href="#">EMSA Newsletter</a>                      | News from the European Maritime Safety Agency            | April 2013 issue |
| <a href="#">JOIFF "The Catalyst"</a>                 | Int'l Organisation for Industrial Hazard Management      | April 2013 issue |

**ITOPF: 2013/14 HANDBOOK AVAILABLE**

A new edition of the ITOPF Handbook has just been published. This contains a wealth of valuable information and guidance for those likely to be involved in spills of oil and chemicals from ships. Information is provided on ITOPF's technical and information services, the fate and effects of marine oil spills, clean-up techniques, the organisation of spill response and planning, the status of international conventions and ITOPF staff.

Download the [full version](#) in PDF format (1 MB) Hard copies of the Handbook are also available. They are free to ITOPF Members and Associates, as well as to closely related groups. Single copies are also available to others on request - contact [Terry Goodchild](#).

**ITOPF: NEW SERIES OF TECHNICAL INFORMATION PAPERS (TIPS) IS NOW AVAILABLE IN FRENCH**

The 17 papers provide practical guidance on many aspects of oil and chemical spill response in the marine environment, including contingency planning, dispersants, shoreline clean-up, waste disposal and claims. They are based on the experience of ITOPF's technical staff at almost 700 pollution incidents worldwide and reflect recent developments and technological advances. The papers are available in PDF and printed formats; see ITOPF's [French Publications page](#) for further details. Chinese editions of the TIPs are also available and Spanish, Russian and Korean versions will follow later this year.

**Events**

**GIWACAF: EVENTS IN TOGO, LIBERIA, MAURITANIA, CAMEROON, ANGOLA, AND NAMIBIA**

[More info](#)

## Events (continued)

### IRELAND: PROGRAMME ISSUED - ISAA OIL SPILL SEMINAR IN DUBLIN ON 9<sup>th</sup> MAY 2013



You are invited to participate in an Oil Spill Response Seminar being held at the Carlton Hotel, Dublin Airport on Thursday 9<sup>th</sup> May. Speakers include representatives from the Insurance Industry, Coastguard, Port Authorities and Local Government. Specialists in oil spill response will update delegates on techniques and a central theme of the seminar will be client expectations regarding the performance of response contractors.

For overseas visitors a shuttle bus will operate from the airport. This one day event runs from 10 am to 4.30 pm. Places are limited and it is recommended to book your place as soon as possible. The cost of attendance is £40/€50 for ISAA members/associate members and £60/€70 for non-members. The booking fee is inclusive of teas/coffees and a carvery lunch.

[Download the programme](#)   [Download the booking form](#)

### SINGAPORE: ASIA'S FIRST OFFSHORE ASSET INTEGRITY MANAGEMENT CONFERENCE

25-28 June 2013. [More info](#)

### UAE, DUBAI: OFFSHORE ARABIA 2014 – FIRST ANNOUNCEMENT

3-5 March 2014 [More info](#)

## Company news

### ISCO MEMBER VIKOMA INTERNATIONAL LAUNCHES MAJOR NEW PRODUCT AT SPILLCON



Oil pollution and environmental technology company, Vikoma International Limited, has unveiled the latest addition to its range of class-leading offshore oil pollution recovery systems.

The OPRS 300 (Oil Pollution Recovery System) is based upon patented oil-attracting discs which have been proven to collect up to 300 m3 per hour of oil and can work across oils with viscosities ranging from 1 to 1 million cSt.

Peter Tyler, Managing Director of Vikoma, said: "We are delighted to be launching this exciting new product at Spillcon 2013. Our design, engineering and manufacturing teams were presented with a challenging brief based on specific market feedback. Thanks to the introduction of a number of innovative solutions, the result is a system utilising a unique oil collection principle."

The OPRS 300 comprises of a floating skimmer head which utilises Vikoma's tufted disc technology combined with both an on-board recovered oil discharge pump and thrusters for manoeuvrability. The unit is operated by a hand held remote control console. <http://www.vikoma.com>

### TWO ISCO MEMBERS WORKING TOGETHER - HONG KONG SPILL RESPONSE COMPANY LTD (HKSR) ESTABLISHES PARTNERSHIP WITH AQUA-GUARD; AND CONTRACT AWARDED

Hong Kong Spill Response Company Ltd (HKSR) established a partnership with Aqua-Guard Spill Response Inc. on June 28th, 2012. Since then, HKSR has been successfully promoting Aqua-Guard products and services in the Chinese marketplace.

HKSR Technology has recently won a tender issued by the Hainan Maritime Safety Administration (MSA) for the supply of large scale Aqua-Guard Oil Skimming systems with RBS TRITON™ technology.

[More info](#)



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