

## ISCO & THE ISCO NEWSLETTER

The ISCO Newsletter is published weekly by the International Spill Control Organisation, a not-for-profit organisation supported by members in 45 countries. ISCO has Consultative Status at IMO, Observer Status at IOPC Funds and is dedicated to raising worldwide preparedness and co-operation in response to oil and chemical spills, promoting technical development and professional competency, and to providing a focus for making the knowledge and experience of spill control professionals available to IMO, UNEP, EC and other organisation.

## ISCO COMMITTEE & COUNCIL

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The Register of ISCO Members is maintained by **Ms Mary Ann Dalglish** (Membership Director). She is also responsible for collecting membership dues.

The Executive Committee is assisted by the non-executive ISCO Council composed of the following national representatives – **Mr John Wardrop** (Australia), **Mr Osman Tarzumanov** (Azerbaijan), **Mr John Cantlie** (Brazil), **Dr Merv Fingas** (Canada), **Captain Davy T. S. Lau** (China, Hong Kong), **Mr Li Guobin** (China, Mainland), **Mr Darko Domovic** (Croatia), **Eng. Ashraf Sabet** (Egypt), **Mr Torbjorn Hedrenius** (Estonia), **Mr Pauli Einarsson** (Faroe Islands), **Prof. Harilaous Psarftis** (Greece), **Captain D. C. Sekhar** (India), **Mr Dan Arbel** (Israel), **Mr Sanjay Gandhi** (Kenya), **Chief Kola Agboke** (Nigeria), **Capt. Chris Richards** (Singapore), **Mrs Fatima B. Shaik** (South Africa), **Dr Ali Saeed Al Ameri** (UAE), **Mr Kevin Miller** (UK) and **Dr Manik Sardesai** (USA).

For more info on Executive Committee and Council Members go to [www.spillcontrol.org](http://www.spillcontrol.org)

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## International news

For more information on the events featured below, click on the banners



**SEASON'S GREETINGS  
TO ALL OUR READERS**



**IOSC 2017**  
International Oil Spill Conference

## UNDERSTANDING WRECK REMOVAL



December 9 - A meeting of salvage and wreck professionals in London, United Kingdom has been introduced to IMO's Nairobi Wreck Removal Convention.

The treaty provides the legal basis for States to remove, or have removed, shipwrecks that may threaten the safety of lives, goods and property at sea, as well as the marine environment.

IMO's Jan De Boer outlined the Convention's key provisions in a session on "Operating within guidelines, conventions and authorities' requirements" at the 19th Salvage & Wreck Removal Conference (7-9 December).

These provisions include uniform international rules for the prompt and effective removal of wrecks located beyond territorial seas, and optional application of the rules in countries' territories, including territorial seas.

IMO <http://www.imo.org/EN/Pages/Default.aspx>

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## International news (continued)

### DATABASE TO SUPPORT INFO EXCHANGE ON DANGEROUS & POLLUTING GOODS

December 6 - The accurate reporting and timely exchange of information on ship's cargo is vital to minimise safety risks and ensure quick and effective response to maritime reported in SafeSeaNet is the aim of the recently developed Central Hazmat Database.

Available on EMSA's maritime portal, this database lists the dangerous and polluting goods whose transportation must be notified by European law and international convention.

The CHD can be used as a reference and a verification tool during the Hazmat reporting process, both at national and central level. In the near future it will also include a link to the relevant incidents.

Improving the quality of information on dangerous and polluting goods entries in the MAR-CIS database, which is also being developed by EMSA and includes information on the associated hazards and risks of dangerous and polluting goods. *EMSA* [Read more](#)

## Incident reports from around the world

### USA: KENTUCKY: BIO-DIESEL LEAK IN NORTHERN SCOTT COUNTY KILLS THOUSANDS OF FISH

December 1 - A bio-diesel leak has affected a creek in northern Scott County near Sadieville.

A cleanup firm hired by Love's Travel Stop on Porter Road has pumped out over 60,000 of gallons of water from Little Eagle Creek, which included about 3,000 gallons of biodiesel, according to a county official.

*Lexington Herald Leader* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

## Incident reports from around the world (continued)

### VIETNAM: OIL SPILL IN DONG NAI AFTER BARGE CAPSIZES

December 2 - The barge, coded SG0595, was being steered by Huynh Cong Danh, 38, a resident of Ca Mau Province. Unable to maintain balance, it reportedly tilted and sank when materials on it were being craned to the shore. *Vietnam.net* [Read more](#)

### TURKEY: TWO FUEL TANKERS COLLIDE IN MARMARA SEA



December 4 - Two fuel tankers collided at the entrance of the Dardanelles Strait early on Nov. 30, Doğan News Agency has reported. A Turkish-flagged fuel tanker called Beşiktaş Bosphorus, filled with 140,000 tons of fuel oil, was heading to Trieste in Italy from Novorossyisk in Russia. The other tanker, a Bahamas-flagged fuel tanker called Chryssi that was filled with 4,700 tons of fuel oil, was heading to Valetta in Malta from Kavkaz in Russia. The collision occurred in the Karabiga Demir area of the Dardanelles. *Daily News* [Read more](#)

## Incident reports from around the world (continued)

### **SPAIN: PRODUCT TANKER FT FOCE COLLIDED WITH MOORED LPG TANKER HAPPY EAGLE AT CEUTA**

December 5 - The product tanker FT Foce collided with moored LPG tanker Happy Eagle at Ceuta, Spain. The accident happened during maneuvering of product tanker FT Foce for leaving the port, which lost propulsion power after engine failure. The vessel stuck with her bow on the stern of the moored LPG tanker Happy Eagle. *Maritime Herald* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

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### **SOUTH AFRICA: SALVAGE UNDERWAY AFTER CREW ABANDONS BULK CARRIER OFF CAPE TOWN**

December 6 - A salvage operation is underway to retrieve an abandoned bulk carrier from the Atlantic Ocean off the coast of South Africa following a fire in its engine room on Sunday. The South African Maritime Authority confirmed Tuesday that all 19 crew members have been evacuated from the ship and are currently in Cape Town. *gCaptain* [Read more](#)

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### **USA: NORTH DAKOTA OIL PIPELINE SHUT DOWN AFTER 'SIGNIFICANT' SPILL IN CREEK**

December 6 - A pipeline leak caused a significant oil spill in a tributary of the Little Missouri River this week, but the volume of oil released was still unknown Tuesday, Dec. 6, as a winter storm affected response efforts. The spill discovered Monday morning about 16 miles northwest of Belfield contaminated Ash Coulee Creek with the release contained about 2½ miles downstream, said Bill Suess, spill investigation program manager for the North Dakota Department of Health. *Inforum.com* [Read more](#) [Related report and video in ABC News](#)

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### **NIGERIA: ANOTHER SHELL OIL SPILL 'KILLS TWO', ENDANGERS 18 COMMUNITIES IN JONATHAN'S LG**

December 10 - Ogbia local government, home to former president Goodluck Jonathan, is groaning of thirst and environmental degradation after another Shell Petroleum Development Company of Nigeria Ltd (SPDC) pipeline spilled crude oil into what is arguably the most important river in the region.

According to Sodaguwa Festus-Omoni, the lawmaker representing Ogbia federal constituency at the house of representatives, the spillage was due to non-replacement of expired pipelines by the international oil company. *The Cable* [Read more](#)

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### **INCIDENT REPORTS: ROAD TANKER ROLLOVERS, FUEL STATIONS, STATIC TANKS, ETC.**

Note from your editor – As a regular reader of Don Johnston's "Newsy Stuff" I am amazed by the very large numbers of oil spills caused by road tanker rollovers and collisions. The ISCO Newsletter does not usually report on incidents of these kinds because there are just far too many and in any case it would be superfluous to duplicate the excellent work being done by Don.

"Newsy Stuff" is circulated free of charge every few days to members of the DG & Hazmat Group and each issue contains around 20 pages of incident reports and other mainly downstream related news. To find out more about joining DG & Hazmat Group and subscribing to "Newsy Stuff", visit – <http://groups.yahoo.com/neo/groups/DangerousGoods/info>

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## News reports from around the world (countries listed in alphabetical order)

### **ALGERIA RATIFIES THE PREVENTION AND EMERGENCY PROTOCOL OF THE BARCELONA CONVENTION**

Algeria has ratified the "Protocol Concerning Cooperation in Preventing Pollution from Ships and, In Cases of Emergency, Combating Pollution of the Mediterranean Sea" (Prevention and Emergency Protocol). The country deposited the instrument of Ratification on 14 November 2016, as confirmed by the Government of Spain, Depository of the Barcelona Convention.

The Prevention and Emergency Protocol will enter into force for Algeria on 14 December 2016. Its ratification demonstrates Algeria's continued commitment towards the implementation of the Barcelona Convention and its Protocols. Having already adopted its National Contingency Plan in 1994, and ratified a number of International instruments to protect the Mediterranean marine and coastal environment, Algeria is undoubtedly a key actor in the prevention of and response to marine pollution from ships at the sub-regional, regional and international levels. *UNEP* [Read more](#)

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## News reports from around the world (continued)

### AUSTRALIA: NTC HIGHLIGHTS MARCH DANGEROUS GOODS UPDATE

December 7 - The National Transport Commission (NTC) is seeking to raise awareness of changes to dangerous goods transport requirements to be in force in less than four months.

It is encouraging industry and business owners to prepare for the launch of edition 7.5 of the Australian Code for the Transport of Dangerous Goods by Road and Rail, which will come into effect on March 1.

NTC chief executive Paul Retter says the latest updates to the Australian Dangerous Goods Code, which sets out the technical requirements for transporting dangerous goods by road or rail, will continue to keep people safe and protect our environment. *ATN* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

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### AUSTRALIA: AUSTRALIAN SPILL CONTROL INDUSTRY ASSOCIATION 2016/17 OFFICE BEARERS

December 7 - Australia's spill control industry group AusSpill has announced its 2016/17 Office Bearers. At its annual general meeting on 15 November last, AusSpill members elected:

- Scot Abernethy - Chairman
- Trevor Prentice – Deputy Chairman

Mr. Abernethy is Operations Manager of Absorb Environmental Solutions and CEO of Absorb Training and has had eighteen (18) years experience in the spill response industry

Mr. Prentice is a Director of Prencos Environmental, based in Adelaide who has forty (40) years experience in the consultation and supply of products and services to industry and government agencies.

The Association AGM also voted 3M's Ranmalee DeSilva onto the AusSpill Board, where she joins EnviroSmart's Steve Clark & Spill Station's Nathan Cartwright.

Established in 2012, AusSpill Association (AA) represents Australian spill control manufacturers, resellers/wholesalers & importers as a single voice to government, the public and the environment protection industry. [More info](#)

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### INDONESIA: INDONESIA CALLS ON AUSTRALIA TO HELP WITH MONTARA OIL SPILL AFTERMATH

December 6 - One of Indonesia's most senior ministers has called on Australia to help find a solution to the 2009 Montara oil spill which he says caused lasting negative impacts in one of the country's poorest provinces.

Coordinating Minister for Maritime Affairs Luhut Pandjaitan told Fairfax Media that after seven years there was still no resolution for those affected by the worst oil spill in the history of Australia's offshore petroleum fields.

Fishermen and seaweed farmers in Nusa Tenggara Timur say fish populations were wiped out and seaweed crops died after oil spilled as a result of an explosion at the Montara rig, operated by oil company PTTEP Australasia.

"There is no solution so far and the victims are fishermen in the area. Australia should help out as well to solve this problem," Mr Pandjaitan said. "I don't think we can do it alone." *The Sydney Morning Herald* [Read more](#)

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### IRELAND: ISAA MEETING AND CHRISTMAS LUNCHEON

December 9 – The ISAA "All Ireland" Scheme Members and Stakeholders Meeting was held today at the Irish Coastguard HQ in Dublin. The meeting minutes will be circulated in the near future to all members and stakeholders.

After the business meeting guest speaker Mr Paul Moroney, Senior Engineer, Water Services and Environment, Galway County Council. Mr Moroney gave a presentation on "Local Authority Tier 1 and Tier 2 Oil Spill Response" addressing County Council expectations in regard to performance of spill response contractors, the way oil spill response is handled by County Councils and recent oil spill response experience and problems arising from oil spills.

The day's events concluded with a celebratory Christmas Luncheon.

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### IRELAND: THE SINKING OF THE KOWLOON BRIDGE, 25 YEARS AGO – THE WORLD'S LARGEST WRECK

December 3 - Twenty five years ago today, the ore-bulk-oil carrier [MV Kowloon Bridge](#) sank off the coast of West Cork with a cargo of 165,000 tons of iron ore and 2,000 tons of bunker oil, becoming the world's largest shipwreck by tonnage.

The Kowloon Bridge was bound from Quebec, Canada to the River Clyde, in Scotland when she started to develop structural cracking on the main deck during a storm. She diverted to Bantry Bay, Ireland. She subsequently suffered steering gear failure and on Monday, November 24th, 1986, ran aground off 'The Stags,' near Baltimore, West Cork in the Republic of Ireland. Attempts at salvage failed and on December 3, the ship broke in half and sank.

## News reports from around the world (continued)

The almost 2,000 tonnes of fuel oil which leaked from the wreck did significant damage to local beaches, fisheries and wildlife. The Kowloon Bridge was a sistership to the MV Derbyshire which sank with all hands during Typhoon Orchid in 1980. *The Old Salt Blog* [Read more](#) [Thanks to gCaptain newsletter]

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### NEW ZEALAND: ARE COUNCILS PREPARED ENOUGH FOR OIL SPILLS?

December 7 - Fewer than half of the nation's councils have enough staff trained to respond to marine oil spills - prompting questions over whether authorities are prepared to deal with a major leak.

According to Maritime New Zealand, just 47 per cent of regional councils have trained responders at or above 80 per cent of the recommended number - and some of the biggest shortfalls are in regions where the most oil drilling and exploration take place. *New Zealand Herald* [Read more](#)

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### NIGERIA: NIGERIAN OIL SPILL DETECTION AGENCY DRAGS EXXONMOBIL TO COURT OVER BREACH OF ENVIRONMENTAL LAWS

December 6 - The National Oil Spill Detection and Response Agency (NOSDRA) has dragged Mobil Nigeria Unlimited operators of NNPC and MPN joint venture before a Federal High court in Uyo over breach of laws governing oil spill and other environmental matters.

Specifically, NOSDRA is accusing the oil firm of contravening section 6(3) of the agency's Act 2006, especially as it concerns environmental standards.

In a writ of summons filed at the Federal High Court in Uyo in a case between NOSDRA and ExxonMobil made available to newsmen in Uyo, counsel to the Federal Agency, Charles Atebo and Gboyega Oyekanmi argued that the purported clean up carried out by ExxonMobil ignored section 6(a) of Regulation 25; Oil Spill Recovery, Clean-up, Remediation and Damage Assessment Regulation of 2011. *Naija247News* [Read more](#)

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### NIGERIA: 1,048 PEOPLE KILLED IN 11 MONTHS IN TANKER, TRAILER CRASHES ACROSS NIGERIA

December 7 - At least 1,048 people were killed in 770 road crashes involving 4,365 tankers and trailers from January to November 2016, an official has said.

Boboye Oyeyemi, the Corps Marshal of the Federal Road Safety Commission, FRSC, stated this on Wednesday in Abuja at an interactive session with stakeholders in the road transport sector.

Mr. Oyeyemi said 4,365 people were also injured during the period of review.

According to him, crashes involving tankers and trailers had been on the decrease since 2014 as 1,862 people were killed in that year while 1,285 deaths were recorded in 2015.

"On comparative notes, it was observed that while there was 31.9 per cent reduction in road traffic crashes between 2014 and 2015, 38.6 per cent was recorded between January and November this year. *Premium Times* [Read more](#) [Thanks to Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

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### SOUTH AFRICA: PORT OF REFUGE FOR ANTAIOS DENIED UNTIL FUEL REMOVED



December 9 - On Thursday, the South African Maritime Safety Authority (SAMSA) announced that it would not permit the disabled freighter Antaios to approach the coast or to enter a port of refuge until after her fuel is lightered off.

Last weekend, Antaios suffered an engine room fire and flooding some 870 nm west of Cape Town. Her crew abandoned ship and were picked up by the Japanese ore carrier NSU Fortune, which carried them safely to Cape Town.

SAMSA said that the salvage tug Smit Amandla has taken the Antaios under tow,

## News reports from around the world (continued)

and that a second tug with special equipment will be dispatched in order to transfer off the freighter's bunkers. Salvors will then pump out the Antaios' flooded compartments and make initial repairs.

"The South African Maritime Authority (SAMSA) requires the owner to prioritise the removal of the casualty's bunkers to neutralise any environmental threat before giving permission for the vessel to proceed closer to the South African coast," said Capt. Nigel Campbell, SAMSA executive head for the Centre for Shipping. "Until such time as the fuel transfer operation has been completed, vessel surveys undertaken and a comprehensive salvage plan approved, SAMSA has ordered that casualty remain at least 30 miles off." *The Maritime Executive* [Read more](#)

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### USA: THOUSANDS OF INVISIBLE OIL SPILLS ARE DESTROYING THE GULF

December 5 - Every year thousands of oil and chemical spills occur in waters around the country, but unless you live in a highly impacted area like Louisiana, you probably only hear about a handful of them. That's partly because the Coast Guard classifies many spills—up to 100,000 gallons—as minor or moderate, and small spills get less of everything: less media attention, less regulation, less environmental impact assessment, and most critically, less funding to clean them up. *Wired.com* [Read more](#)

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### USA: BP'S MAD DOG LEADS THE OIL PACK'S RETURN TO THE GULF OF MEXICO

December 5 - BP Plc's decision to move ahead with a \$9 billion project to drill in the Gulf of Mexico is the first step toward major oil companies moving forward with U.S. offshore plans postponed during crude's price rout.

Exploration and development of new wells in the Gulf slowed as crude prices cratered from over \$100 a barrel in 2014 to a low of \$26.05 early this year. *Reuters* [Read more](#)

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### USA: AFTER PAULSBORO CRITICISM, RAILROADS ADOPT FEDERAL STANDARDS FOR CHEMICAL SPILL RESPONSE



(ALEJANDRO A. ALVAREZ/STAFF PHOTOGRAPHER) For the chemical spilled in Paulsboro in 2012, vinyl chloride, railroad standards called for a half-mile evacuation in case of fire. Federal guidelines said the evacuation should be double that, a mile.

December 6 - Freight railroads have agreed to rely exclusively on federal safety response recommendations, rather than their own guidelines for accidents involving dangerous chemicals, drawing praise from New Jersey lawmakers who sought that change after a Conrail derailment caused a toxic spill in Paulsboro in 2012.

The shift, the lawmakers said, will help eliminate confusion that might result from differences in federal recommendations and railroad protocols, and ensure that federal standards are used in the event of spills. The guidelines give emergency responders information about fire risks, immediate steps to respond to a spill and evacuation distances, among other information. *The Inquirer* [Read more](#)

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### USA: TRAILERS TO BE DEPLOYED ALONG OIL-TRAIN ROUTES

December 8 - The specialized trailers are full of absorbent materials, booms and other equipment needed to fight an oil spill, whether it occurs on a regional rail line or on a highway.

## News reports from around the world (continued)

Four Capital Region counties will be getting new emergency response trailers designed to help them deal with any incidents involving oil trains or oil spills, Gov. Andrew Cuomo said Monday.

The trailers, one per county, will be provided at no cost to emergency responders in Schenectady, Saratoga, Montgomery and Albany counties. They have already begun arriving. *Emergency Management* [Read more](#)

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### USA: AS ETHANOL PRODUCTION GROWS, SO DO SPILLS IN MIDWEST

December 8 - An ethanol spill occurs every two days on average in the Midwest, the worst of which result in contamination of water supplies, major fish kills, loss of life and millions of dollars of damage.

The Midwest Center for Investigative Reporting found that as production and transportation of ethanol has risen dramatically in the region over the past three decades, so have ethanol spills.

“As more and more ethanol is being transported, more and more accidents are going to occur,” said Mark Clapp, an instructor at the Illinois Fire Service Institute in Champaign, Illinois. “The potentials for different kinds of accidents are getting higher and higher.” In 1985, the Midwest experienced 36 spills. By 2015, the number was up to 173, reaching as high as 211 in 2013, according to the U.S. Department of Transportation Hazardous Materials Incident database *Iowa Watch* [Read more](#)

## ISCO News

### ISCO WELCOMES NEW MEMBERS

**Citadel Energy Resources Ltd.** is an oilfield engineering management and services provider based in Port Harcourt, Rivers State, Nigeria. The company has joined ISCO as an Industry Partner.

**Canadyne Technologies Inc.**, based in Vancouver, B.C., is Canada's largest manufacturer of oil spill containment boom, and a leader in the design, manufacture, and supply of advanced oil spill response equipment. The company, which has joined ISCO as a Corporate Member, has its website at <http://www.canatec.com/>

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### NEW MEMBER OF ISCO COUNCIL

Carlos Sagrera, MSc, MISCO, has been appointed as the Member of ISCO Council for Panama. He works in Panama as specialist in oil spill prevention and response for the public and private sector. He is a former LCDR (Uruguayan Navy) and Environmental Geographer (UCL, Belgium). He has been a member of ISCO since 2011. Experience includes acting as operational manager with the principal OSRO in Panama OPC until 2008 including offshore and onshore spills level Tier 2 and 3. After this he had worked as consultant to several OSRO in the Central America region and Mexico. He had supported the last 20 years the Latin America Oil & Gas industry, several governments and regional specialized organizations with their NCP and the regional cooperation in emergency and oil spill response, planning and training. As environmental consultant he had managed several national and regional projects for international funding organizations and the NU environmental system, working actually for IMC Panama as external advisor. He has work experience in Panama, Belize, Costa Rica, Nicaragua, Guatemala, Honduras, El Salvador, Aruba, Mexico, USA, Argentina, Brasil, Paraguay and Uruguay.

## Obituaries

### DR. “JAG” COOK

Your editor was saddened to have recently heard of the death of Dr “Jag” Cook, former Head of the Hazardous Materials Unit at the UK Atomic Energy Authority. Dr Cook was diagnosed with terminal cancer earlier this year and sadly died on 30<sup>th</sup> October 2016. His going very peaceful and he was not in pain. His family were with him. Dr Cook was a true gentleman and a much respected scientist who will be greatly missed by his many friends and former colleagues. March 2017 will mark the 25<sup>th</sup> anniversary of the Herald of Free Enterprise disaster at Zeebrugge, Belgium, at which Dr Cook acted as the Technical Advisor to the response team of your editor's former company (Alba International Ltd.) during an operation to retrieve and safely repack a very large quantity of hazardous chemicals.

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## EVALUATION

### A new series of articles contributed by Mark Francis of Oil Spill Solutions

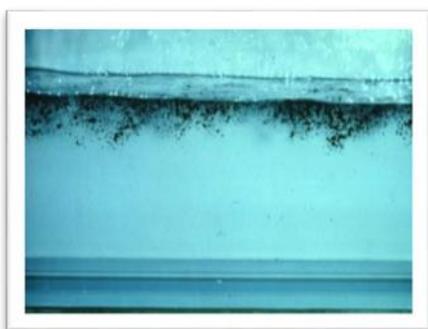


Mark Francis has been involved with the oil industry since 1975. He attended his first oil spill in 1976, the Tanker Elaine V incident. He became head of response for inland spills within the UK for British Petroleum E & P in 1980 for 10 years responding to well, storage tank and pipeline spills throughout the UK. Over the next 25 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.

## Part 9

### Weathering or the Fate of oil (continued)

#### Dispersion into droplets and particles.



Natural dispersion is the process by which small droplets of oil are formed and integrated into the water column by the energy of breaking waves.

These oil droplets may either remain in suspension if they are very small in size, or float back to the water surface if they are fairly large.

The large droplets that float back to the water surface may coalesce and form an "oil sheen".

Particularly viscous oils disperse more slowly and can persist in the ocean for prolonged periods of time.

Dispersion of the oil results in lowering the localized concentration of the oil.

#### Sedimentation.

Some heavy oils and refined products with densities higher than one (the density of fresh water) will sink in fresh or brackish water.

Sea water has a density slightly higher approx. 1.025 and very few crude oils are dense enough or weather sufficiently for them to sink at sea.

The residues from burning oil may become dense enough to sink.

In shallow waters with suspended solids are in high quantities oil may have the added weight of these sediments allowing them to sink and become part of the sediment.

Oil on sandy shorelines often adsorb sand and other sediments. If it is washed back into the sea it may sink.



#### Oxidation.



Crude oil is a complex mixture of organic compounds, mostly hydrocarbons.

Oxidation alters these mixtures by creating new compounds and by rearranging the residual compounds, based on their susceptibility to the oxidative process.

The ultimate oxidative fate of all of the organic compounds, given an unrestricted supply of oxygen and time, is conversion to carbon dioxide and water.

Oxidation of crude oil is mediated by two processes, photo-oxidation and microbial oxidation, that provide the energy to drive the oxidative reactions.

Where crude oil is exposed to sunlight and oxygen in the environment, both photo-oxidation and aerobic microbial oxidation take place. Where oxygen and sunlight are excluded in anoxic environments, anaerobic microbial oxidation takes place

## Special feature (continued)

### Biodegradation by micro-organisms.

When marine microorganisms metabolize oil compounds, it is referred to as biodegradation.

As with all of the weathering sub-processes, biodegradation is influenced by oil properties, temperature and, in addition, availability of oxygen and nutrients.

Because different microorganisms degrade specific hydrocarbons, multiple species of microorganisms must be involved for biodegradation to occur.

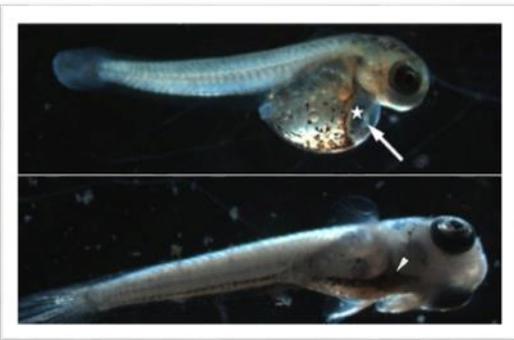
Populations of specific microorganisms increase during a spill following the increased availability of nutrients. However, as nutrients and oxygen once again become limiting, populations return to their natural state.

Larger and more complex molecules are more difficult to biodegrade.

Because the sub-processes of natural dispersion and emulsification increase the available surface area, they encourage biodegradation.

As a result, biodegradation is often the final step in oil weathering and also often responsible for eliminating the last traces of oil.

### Uptake by marine organisms.



Fish can be impacted through the intake through the gills. Ingestion of oil or oiled prey can affect eggs and larval stages or change ecosystems that support fish.

Adults may experience reduced growth, changes in heart and respiration rates.

Oil has the potential to impact spawning success as eggs and larvae of many fish species are highly sensitive to oil toxins.

### Formation of tarry lumps.

Persistent oil residues have two major fates: shoreline stranding for spills near to shore and tarball formation for releases in offshore waters.

Oil loading on a shoreline can be highly variable, and the amount of oil and the rate of natural removal drive the decision to conduct shoreline cleanup.

As a result of the various physical and chemical processes that affect floating oil from seeps, spills, and operational discharges, oil can eventually coagulate into residues called tarballs.

While some tarballs may be as large as pancakes, most are coin sized.

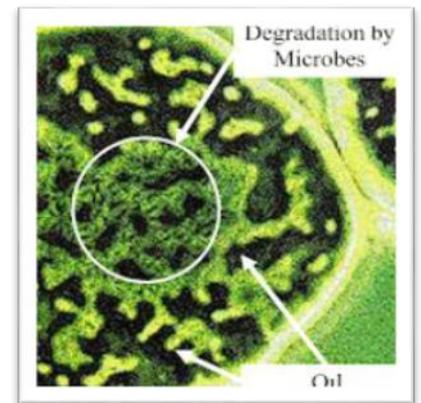
Spills of heavy oils often quickly break into patches of tarballs, making them difficult to track.

Tarballs are very persistent in the marine environment and can travel hundreds of miles, sometimes re-concentrating in convergence zones far from the original spill site.

### Diffusion Horizontal

Horizontal transportation and horizontal diffusion are separate processes that stand apart from, but may enhance, spreading.

Horizontal transport means displacement along a horizontal axis, whereas, horizontal dispersion or diffusion is movement about a defined point and does not necessarily involve net movement.



## Special feature (continued)

### Diffusion Vertical

Vertical dispersion and entrainment are the movements of oil droplets of sizes less than about 100 µm (microns) into the water column.

Typically droplets that stay submerged of minutes to hours have droplet sizes less than about 20 µm. Larger droplets will rise quickly to the surface.

*Acknowledgement of borrowed photos and other material in this article – Over a period of years Mark has compiled an extensive repertoire of material for training purposes, some of which has been replicated in this article. As all the original sources cannot all be recalled, he apologises for not being able to acknowledge individual sources but does wish to record his gratitude to those who have helped him*

**To be continued**

## Publications

### **NEW API REPORT - OPTIONS FOR MINIMIZING ENVIRONMENTAL IMPACTS OF INLAND SPILL RESPONSE**

This report was prepared by Jacqueline Michel, Research Planning, Inc. and Mark Ploen, QualiTech.

This guide incorporates lessons learned from spill responses that can minimize the environmental impacts of inland oil spills. In addition, it provides new information on the changing risk profiles of inland spills in North America. There are eight sections and four appendices as follows:

Section 1: Purpose and Background: Describes the purpose of this guide and differences since the 1994 inland guide.

Section 2: Inland Spills: Sources and Risks: Provides brief summaries of available data and information on inland spill sources (pipelines, rail, tanker truck, tank barge/towing vessel, oil exploration and production facilities, and other regulated facilities), spill types and volumes, and recent trends.

Section 3: Comparisons Between Inland and Marine Oil Spills: Highlights oil behavior and environmental and human concerns for inland spills that are different from marine spills. It also describes the different types of sensitive resources of inland environments and outlines consultation requirements.

Section 4: Oil Properties, Toxicity, and Behavior: Defines the oil types by groups 1-5, which are used throughout the guide. Summaries are provided on the properties, typical behaviors, toxicity, and changes in properties as oil weathers.

Section 5: Inland Oil Spill Detection, Delineation, and Characterization: Discusses current accepted methods for oil spill detection, delineation, and characterization for inland spills.

Section 6: Best Practices for Inland Oil Spill Response: Includes descriptions of the response techniques and inland environments that are the backbone of the guide. Guidance is provided for options to minimize environmental impacts while achieving response goals, and a “stoplight” matrix is used to indicate the relative impact of each response technique on each inland environment for each oil group.

Section 7: Cleanup Endpoints: Provides guidance on selecting appropriate cleanup endpoints for inland spills.

Section 8: Special Considerations: Provides guidance on some issues of special concern for inland spills, including protection of water intakes, response to spills of ethanol-blended fuels, air quality, release of oil field produced waters, treatment of oiled debris, intermittent sheens, and fast-water booming strategies.

Section 8: References: Includes references cited in the report and suggested further readings.

Appendix A: Properties of Nonconventional Oils: Provides summaries on the categories and environmental behavior and effects for light shale oils, diluted bitumen products, biodiesel, and non-petroleum oils.

Appendix B: Best Management Practices: Includes current best management practices for different response actions to minimize collateral impacts during implementation of approved response operations.

## Publications (continued)

Appendix C: Firefighting Foam: Describes the current types of firefighting foam, how they can be used to combat oil fires, and guidelines for management of firefighting foam wastewater.

Appendix D: Responding to Spills of Very Light Crude Oils that Ignite: Provides guidance to responders for spills of these volatile oils.

The new report is now available on the API website, under the heading of Inland:

<http://www.oilspillprevention.org/oil-spill-research-and-development-cente>

## Links for recent issues of other publications (in alphabetical order)

<a href="#">AMSA Aboard</a>	News from the Australian Maritime Safety Authority	August 2016
<a href="#">ASME EED EHS Newsletter</a>	News and commentary on HSE issues from George Holliday	Most recent issue
<a href="#">Bow Wave</a>	Sam Ignarski's Ezine on Marine & Transport Matters	Current issue
<a href="#">Cedre Newsletter</a>	News from Cedre in Brittany, France	November 2016
<a href="#">CROIERG Enews</a>	Canberra & Regions Oil Industry Emergency Response Group	Current issue
<a href="#">EMSA Newsletter</a>	News from the European Maritime Safety Agency	December 2016 issue
<a href="#">Environmental Technology Online</a>	Environmental Monitoring, Testing & Analysis	November 2016 issue
<a href="#">IMO News Magazine</a>	News from the International Maritime Organization	No 3, 2016
<a href="#">IMO Publishing News</a>	New and forthcoming IMO publications	November 2016
<a href="#">Intertanko Weekly News</a>	International news for the oil tanker community	December 9, 2016
<a href="#">JOIFF "The Catalyst"</a>	Int'l Organisation for Industrial Hazard Management	October 2016 issue
<a href="#">MOIG Newsletter</a>	News from the Mediterranean Oil Industry Group	October 2016 issue
<a href="#">NOWPAP Quarterly</a>	News from the North West Pacific Action Plan	Quarter 1, 2016 issue
<a href="#">Ocean Orbit</a>	Newsletter from the International Tanker Owners Pollution Federation	May 2016
<a href="#">OCIMF Newsletter</a>	News from the Oil Companies International Marine Forum	November 2016 issue
<a href="#">Pollution Online Newsletter</a>	News for prevention & control professionals	November 30 2016
<a href="#">Sea Alarm Foundation Newsletter</a>	Oiled wildlife Preparedness and Response news from Sea Alarm	Autumn 2015 issue
<a href="#">Technology Innovation News Survey</a>	News from US EPA – Contaminated site decontamination	October 16-31, 2016
<a href="#">The Essential Hazmat News</a>	Alliance of Hazardous Materials Professionals	Feb 29, 2016 issue
<a href="#">Transport Canada Newsletter</a>	News and articles re transport of dangerous goods in Canada	July 2016 issue
<a href="#">USA EPA Tech Direct</a>	Remediation of contaminated soil and groundwater	December 1, 2016
<a href="#">USA EPA Tech News &amp; Trends</a>	Contaminated site clean-up information	Spring 2016 issue
<a href="#">WMU Newsletter</a>	News from the World Maritime University	July 2016 issue

Your editor depends on regular receipt of updated links for listed publications. If these are not received, relevant entries may be discontinued

## Events

### UPCOMING EVENTS SUMMARY

COUNTRY	2017	TITLE OF EVENT	LOCATION
For more information click on Title of Event			
USA	January 4-6	<a href="#">27th Annual, No-Spills Conference</a>	Acme, Michigan
KUWAIT	January 10-12	<a href="#">Kuwait 2nd Oil Spill Conference</a>	Kuwait
JAPAN	February 2	<a href="#">PAJ Oil Spill Workshop 2017</a>	Tokyo
UK	March 7	<a href="#">UK Spill Annual Members' Meeting and Dinner</a>	London
USA	March 28-30	<a href="#">2017 SCAA Annual Meeting &amp; Conference</a>	Washington DC
UAE	April 10-12	<a href="#">RECSO EnviroSpill 2017</a>	Abu Dhabi
SINGAPORE	April 25-28	<a href="#">10th Intl Chemical and Oil Pollution (ICOPCE)</a>	Singapore
USA	May 15-18	<a href="#">International Oil Spill Conference</a>	Long Beach CA
USA	June 27-28	<a href="#">Clean Waterways</a>	Louisville KY
<b>2018</b>			
UK	March 13-15	<a href="#">2018 INTERSPILL Conference and Exhibition</a>	London
To request posting of an event of interest to the Spill Response Community please send details to the Editor			

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