

## 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.

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## International news

### BANGLADESH OIL SPILL UPDATES

Not the world's most impressive emergency response action ... As every oil spill response professional knows, effective response depends on speed of reaction. The longer the delay, the more difficult the task becomes. Possibilities for effective damage limitation diminish rapidly. With every passing day time and cost for clean-up increases exponentially and the possibilities of a satisfactory outcome are diminished.

The reaction to this spill has been characterised by a chronic lack of preparedness, aggravated by delay and lack of clarity on responsibilities. There are many lessons to be learned and the blame game has only just begun. In the meantime severe environmental damage has resulted, people have been deprived of their livelihoods and health implications for unprotected clean-up workers are becoming clear.

Below are some recent press reports in chronological order. See also latest news and comment in the ISCO News section of this newsletter.

### December 13 - Bangladesh launches manual campaign to clean up oil spill



Bangladesh launched an intensified manual campaign today to clean up seepage following a huge oil spill in 34,000 hectares at the Sunderbans that threatened the world's largest mangrove forest.

Officials and witnesses said the forest department engaged nearly 100 boats to collect the furnace oil spilled from the tanker which sank in the Shela river in the

Sundarbans after being hit by a cargo vessel on Tuesday.

"At least 200 hired workers in nearly 100 engine and country boats have started a campaign to collect the oil from rivers and channels," a local resident told PTI over phone.

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## International news (continued)

"The workers were loading the boats with the oil they were collecting manually collecting manually using the traditional equipment and depositing those in tanks in nearby ferry terminals". *The Economic Times* [Read more](#)

### December 15 - Bangladesh's response to Sundarbans oil spill slammed



The Bangladeshi authorities say a huge clean-up is underway in the Sundarbans delta. On Tuesday, December 9, a tanker sank and dumped hundreds of liters of furnace oil into the country's protected delta after a collision with another vessel. The oil has spread over 350-square-kilometer area straddling Bangladesh and India. Officials in New Delhi say they are on high alert to deal with the likely flow of oil into their waters.

According to Abul Kalam Azad, a Bangladeshi forestry official, the tanker had been retrieved from the Shela River and towed to a nearby river island. The Bangladesh Inland Water Transport Authority (BIWTA) said the fishermen had been deployed for the next three days to remove the oil.

Maqsood Kamal, a Bangladeshi disaster management expert, blamed the authorities for their slow response to the catastrophe. "For nearly 30 hours, the government did not do anything. Had the officials taken immediate measures, things could have been under control by now, but the spill is now spreading," Kamal told DW. *DW* [Read more](#)

### December 15 - Body formed to oversee oil spill disaster

The government on Sunday formed a high-level committee with representatives from all ministries and departments concerned to oversee the environmental disaster that emerged in the rivers of Sundarbans following the capsizing of an oil tanker, reports UNB.

The committee, led by senior secretary of Prime Minister's Office Abul Kalam Azad, was formed at an inter-ministerial meeting at the Shipping Ministry, public relations officer of the Shipping Ministry

Jahangir Alam said "the committee will monitor overall activities of cleaning up oil from the river to minimise the environmental aftermath of the disaster". *The Financial Express* [Read more](#)

### December 16 - Bangladesh tries to prevent ecological disaster after oil spill

Hundreds of people on Monday were hoping to avoid a major ecological disaster in Bangladesh by cleaning up by hand some of the 350,000 litres of oil spilled from a tanker that sank in the Sunderbans delta, the world's largest mangrove reserve and one of the planet's most fragile ecosystems.

So far, they have cleaned 40,200 liters of the spill, which has severely affected regions up to five kms away -- and to a lesser extent, an area of around 300 sq km -- in a sanctuary that is home to an endangered species of dolphins, according to Ali.

The Bangladesh Petrol Corporation has offered 30 takas (or \$0.39) for every litre of oil recovered from the river in the Sunderbans. Authorities dispatched the vessel Kandari 10 to apply chemical dispersants in the area. However, despite the ship having reached the disaster spot, the assignment was put on hold while the environment ministry studied the effects of the chemical on local fauna, according to the Dhaka Tribune.

United Nations Development Programme Country Director for Bangladesh Pauline Tamesis said the incident showed the need for a total ban on commercial ships in the Sunderbans region. *One India* [Read more](#)

December 17 - Assessing the oil spill's impact on Bangladesh's Sundarbans forest



The oil spill occurred when a tanker collided with another vessel and sank on December 9 in the Bangladesh side of the Sundarbans forest, the world's largest single block of mangrove forest straddling the delta where the Ganges and Brahmaputra Rivers flow into the Bay of Bengal. The oil has spread over a 350-square-kilometer area of channels and creeks of various sizes.

Two days after the collision, an Irrawaddy dolphin carcass was found afloat 25 kilometers from the accident site. Although there is no confirmation that the animal's death was caused by the oil spill, residents have been quoted by German news agency DPA as saying they have hardly seen any dolphins in the area since the spill. Three wildlife sanctuaries in the eastern Sundarbans were declared in 2012, after studies by the Wildlife Conservation Society identified them as 'hotspots' for Ganges River and Irrawaddy dolphins.

Dr. Anurag Danda, an expert on the Sundarbans at the World Wildlife Fund (WWF) in India, says in a DW interview that the extent of the damage to the forest - the world's only mangrove forest with tigers - caused by the oil spill will only be local, with possible deaths of aquatic species due to a drop in oxygen.

The extent of damage will be high locally - spread over about 100-150 square kilometers - with possible deaths of aquatic species due to drop in oxygen, as well as among burrowing creatures such as crabs and mudskippers.

Plants with pneumatophores will also be adversely affected. The Sundarbans in its entirety is unlikely to be affected since the estuaries are north-south aligned; east-west dispersal is limited. Moreover, Dolphin deaths have already been reported and the first photograph of a dead dolphin was released recently. *DW* [Read more](#)

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**December 18 - Oil spill starts taking human toll**

The locals including the fishing community have fallen sick after collecting spilled furnace oil from the oil-tanker, Southern Seven Star, which sank in River Shela last Tuesday off Joymoni in Bagerhat district. Many of the locals have started complaining of health problems trying to save their only source of livelihood, the Sundarbans, without knowing the impact of the salvage operation on their health.

Now after eight days of the sinking of the oil tanker people are facing the great impact of the oil. The accident is threatening trees in the forest and planktons, vast populations of small fish, crabs, dolphins and crocodiles in the river. The oil-spill occurred at a protected site in the Sundarbans mangrove area, home to rare Irrawaddy and Ganges dolphins.

When this correspondent visited the area, she found that a large number of locals were engaged in collecting oil despite their illness. Meanwhile, government-owned oil company Padma Oil enhanced the rate of per litre oil from Tk 30 to Tk 40. The local people mostly fishermen were seen collecting oil from the water without even wearing protective gloves. *The Daily Observer* [Read more](#)

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## International news (continued)

### December 18 - UN sends team to clean up Sunderbans oil spill in Bangladesh

The United Nations said on Thursday it has sent a team of international experts to Bangladesh to help clean up the world's largest mangrove forest, more than a week after it was hit by a huge oil spill.

A team from the United Nations Disaster Assessment and Coordination (UNDAC) has arrived in the capital Dhaka to support Bangladesh's "cleanup efforts of the oil spill in the Sunderbans", a statement from the UN said.

The UN team, sent in response to a request from Bangladesh, will help in the ground work in coordination with the government and will also conduct an assessment and advise on recovery and risk reduction measures.

The European Union and United States, Britain and France are supporting the UN effort. *The Guardian* [Read more](#)

## Incident reports from around the world (in chronological order)

### ISRAEL: SURFACE OIL SUCCESSFULLY REMOVED FROM EVRONA SPILL SITE, CAUSE OF LEAK STILL UNKNOWN

December 15 - The Environmental Protection Ministry will present a plan to the cabinet next week for rehabilitating the Evrona nature reserve, following the massive crude oil spill there on December 4. The surface oil has already been removed from the area, but much contaminated land still requires cleaning. *Haaretz* [Read more](#) (Subscription Required)

December 17 - Crews swaddled in white biohazard suits have been dunking nozzles into streams of oil, racing to soak up the ooze seeping into the desert valley floor here, two weeks after a major spill threatened one of Israel's most precious habitats.

Officials are calling it the worst environmental disaster in the nation's history — a literal blot on a landscape that harbors some of the hardiest known plants and animals, which live in an impossibly difficult environment.

The spill is bad news for the brown babbler, the Balochistan gerbil and the striped hyena, all denizens of the acacia savanna, which is already stressed, having to make do with an inch or so of rain a year and daytime summer temperatures that average 104 degrees. *The Washington Post* [Read more](#)

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### NEW ZEALAND: RENA LEAKING 'BIG BLOTCHES' OF OIL

December 15 - Oil has been spotted near the Rena wreck at Astrolabe Reef, where the stricken cargo ship grounded more than three years ago. Eyewitnesses say the spills covered large areas but officials say the sheen from the spills dissipates almost immediately, suggesting small quantities of oil. *Bay of Plenty Times* [Read more](#)

December 15 - Reports of "big blotches" of oil spotted near the wreck site of the MV Rena at Astrolabe Reef and feared to be coming from the ship's remains have turned out to be just giant, perfectly natural swarms of krill. *gCaptain* [Read more](#)

December 16 - A Rena project spokesman said on several close inspections - conducted by the ship's owner and insurer - the brown bloom was confirmed as krill and was reported and confirmed as such to Maritime New Zealand and the Bay of Plenty Regional Council. *The Maritime Executive* [Read more](#)

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### ARGENTINA: SHIP COLLISION RESULTS IN ARGENTINA OIL SPILL

December 16 - A collision between a tanker and a bulker has resulted in an oil spill in the Parana River, Argentina.

The Italian-flagged products carrier Ghetty Bottiglieri and the 2011-built, Hong Kong-flagged Octbreeze Island were involved in a pretty significant smash on Saturday near San Pedro during a storm. Octbreeze Island suffered damage on its fuel tank causing a fuel spill, prompting the local authority to suspend upstream/downstream navigation. Navigation was restored in the early morning of Sunday, December 14. The damaged vessel received tugboat assistance and oil spill barriers were installed in a containment operation. *The Maritime Executive* [Read more](#)

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### USA: 'PINHOLE' LEAK IN STRAITS OF MACKINAC GAS PIPELINE RAISES FEARS

December 17 - A pinhole leak in a controversial petroleum pipeline running through the Upper Peninsula released an undetermined amount of natural gas liquid that dispersed into the atmosphere north of Manistique, near the Indian River, Michigan Attorney General Bill Schuette announced Tuesday. A spokesman for Canadian oil transport giant Enbridge, which operates the Line 5 pipeline, however, said it was not a leak, but a "pinhole-sized defect, observed in the weld of the pipe," during a planned investigation of the pipeline Dec. 8. *Detroit Free Press* [Read more](#) [Thanks to Marc K. Shaye Hon.FISCO]

## Incident reports from around the world (continued)

### CANADA: ENBRIDGE SHUTS OIL PIPELINE TO U.S. AFTER SPILL IN CANADA



December 18 - Canadian oil supplies to the U.S. Midwest were disrupted after Enbridge Inc. shut a pipeline because of a leak.

The company isolated its Line 4 pipe at the Regina terminal in Saskatchewan yesterday after about 1,350 barrels of oil were released within an on-site pumping station, according to a statement. The company is excavating the line around a pumphouse and hasn't provided an estimate for how long repairs may take, Gerard Kay, deputy chief of operations at Regina Fire and Protective Services, said by phone.

The 796,000 barrel-a-day pipe carries heavy, medium and light sour crude from Edmonton, Alberta, to Superior, Wisconsin. Enbridge spokesman Graham White didn't provide an estimate for when the line will return to service. *Fuel Fix* [Read more](#)

December 19 - Enbridge Line 4 spills 56,700-gallons of oil, causing closure of pipeline to U.S. - Enbridge Inc. reported last night that they "shut down and isolated" the Line 4 pipeline at the Regina Terminal in Saskatchewan at approximately 10:55 p.m. MST on Tuesday, after a release from the line within the on-site pumping station. *Vancouver Observer* [Read more](#)

### NEW ZEALAND: CLEAN UP UNDERWAY AFTER OIL SPILL AT WHANGAREI HARBOUR

December 19 - A clean-up is underway to contain an oil spill in the Whangarei Harbour tonight. The oil spill happened around 4pm when a ship carrying crude oil unloaded at Marsden Point Oil Refinery. Refining NZ says one ship is working to remove the oil from the water and booms are in place to stop the oil washing onto nearby beaches. *TVNZ* [Read more](#)

## Other news reports from around the world (countries in alphabetical order)

### AUSTRALIA: NATIONAL PLAN FOR MARITIME ENVIRONMENTAL EMERGENCIES

December 16 - This year AMSA entered into a long-term contract to provide a new Cairns-based emergency towage vessel, the Coral Knight, for Far North Queensland.

This vessel, which commenced operations in mid-2014, is a substantial component of the larger nationwide emergency towage capability program that AMSA manages as part of the National Plan for Maritime Environmental Emergencies (National Plan).

It is also the primary platform for our aids to navigation maintenance program in its area of operations. *Report in AMSA Aboard* [Read more](#)



### CANADA: CAPT. STEPHEN BROWN: EXXON-VALDEZ-TYPE SPILL IS NOT POSSIBLE IN B.C.



December 15 - In the past few weeks, we have witnessed the protests on Burnaby Mountain, where activists assembled to protest against the survey and sampling work related to potential oil pipeline infrastructure development. One of the main issues in this often emotional and heated debate is whether it is safe to ship oil from B.C.'s coast to markets overseas.

As president of the Chamber of Shipping of British Columbia, I welcome this debate and respect everyone who has a voice in it, including those who question the safety of shipping. But if we are to understand one another's positions, we do have to learn to disagree without being disagreeable and certainly to remain respectful of our courts and those who are tasked to apply their decisions.

Far too often, reason and facts are being sacrificed on the altar of making a political point or in pursuit of a personal agenda. So now that the protests have died down and passions have subsided, I believe it's an opportune time to step back and take an objective look at the overall safety of shipping on the coast of B.C. and tanker safety in particular. Only when armed with the facts can British Columbians make a better and more informed decision about the direction we want our province to take.

So what are the facts that are being clouded in the debate?

First, it is often suggested that allowing tankers in B.C. waters would break with a long-held coast moratorium. This is simply not true. Oil tankers have been transiting B.C.'s coastal waters safely for many years, moving oil and energy products to coastal

## Other news reports from around the world (continued)

communities and markets around the world.

Second, some continue to argue that history predicts the future. Again, not true. Improvements to tanker design and construction have dramatically improved their safety over the last 25 years.

Technological evolution, including double-hulled construction, precision navigation systems, highly trained and dedicated marine pilots and powerful tug escorts means that an Exxon Valdez-type incident is simply not possible on our coast. *The Province*  
[Read more](#)

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### CANADA: IMPROVING OIL SPILL MODELS TO SUPPORT ENVIRONMENTAL EMERGENCY RESPONSE AND CHEMICAL DISPERSANT USE POLICY DEVELOPMENT



December 18 – Project announced to develop a new, three dimensional, subsurface, oil blowout model to provide more accurate information on when, where and how much oil will surface, and what the thickness of the oil slick will be. Details as follows:

In the picture on left - Principal Investigator: Haibo Niu, Department of Engineering, Dalhousie University (Truro Campus)

Confirmed Partners and End-users: Fisheries and Oceans Canada, Bedford Institute of Oceanography. Awarded: \$84,000

Project Summary - Increased oil and gas activity in Canada raises the risk of marine oil spills. The recent Deepwater Horizon disaster has shown that it is vital that a reliable deep-water oil spill model be available to predict the trajectory of oil.

This project will develop a new, three dimensional, subsurface, oil blowout model to provide more accurate information on when, where and how much oil will surface, and what the thickness of the oil slick will be. *MEOPAR* [Read more](#)

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### GHANA: IS GHANA READY FOR A MAJOR OIL SPILL?

December 14 - Some energy analysts have challenged the Environmental Protection Agency (EPA) to push for the passage of a law that demands companies in the extractive sector to make provision for environmental remediation products in case of accidents. This follows the palpable failure of the current legal regime to effectively deal with challenges that have rocked the extractive sector in the past.

One example is the cyanide spillage caused by Goldfields Ghana Limited (GGL) on October 16, 2001, which drained into two rivers, polluting the source of drinking water for several communities.

The Wassa Association of Communities Affected by Mining (WACAM ); a local NGO led a campaign to compel the Ministry of the Environment to order the EPA and the Ghana Water Research Institute to conduct independent investigations into the accident.

According to the Executive Director of the Integrated Social Development Centre (ISODEC), Dr Steve Manteaw , Ghana as a state also lacks the “capacity” to deal with any major catastrophe , which makes the situation worse.

Ghana started drilling oil commercially from December 15, 2010 but some have questioned how robust the nation’s legal framework is to deal with any oil spillage.

Cabinet has approved the draft Petroleum Exploration and Production (E&P) Bill and is expected to soon go before Parliament for ratification. This is after government withdrew the bill from parliament in 2010 after civil society protested that the bill had serious deficiencies. *Citifmonline* [Read more](#)

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### USA: VIRGINIA WATER COMMISSION ISSUES FIRST REPORT POST ELK RIVER POLLUTION

December 15 - While some legislative leaders may be planning to revisit significant portions of the state’s new drinking water protection and chemical storage tank safety law, a commission studying the issue says it’s too soon to make sweeping judgments about the measure. Members of the state’s Public Water Supply Study Commission outlined some potential changes to the law, but also cautioned in a new report that significant portions of it are still being implemented, with compliance deadlines in some cases still more than a year away. “Since the legislation has been in effect in a relatively short period of time, the commission was unable to assess the overall effectiveness of the legislation,” said the report, made public this morning.

The commission, headed by state Homeland Security Director Jimmy Gianato, was created as part of SB373, the bill passed in response to the Jan. 9, 2014, chemical spill at Freedom Industries, which contaminated the Elk River drinking water supply that serves hundreds of thousands of people in Charleston and surrounding communities. *Gazette Mail* [Read more](#)

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## Other news reports from around the world (continued)

### USA: HANFORD TANKS STILL DETERIORATING - FEDERAL AGENCY NOT FUNDING PURCHASE OF REPLACEMENTS

December 16 - Underground nuclear waste storage tanks on the Hanford Nuclear Reservation continue to deteriorate, raising questions about how their contents will be managed in the future, according to a report released Tuesday by the Government Accountability Office.

Hanford, near Richland in eastern Washington, contains 177 nuclear waste tanks, some of which have leaked. The nation's largest collection of radioactive waste is left over from the production of plutonium for nuclear weapons.

The GAO report said that both the older single-walled tanks and newer double-walled tanks are deteriorating. Some tanks date to the 1940s and are long past their designed lifespans. The Energy Department agreed with the report and its recommendations. But U.S. Sen. Ron Wyden, D-Ore., who requested the report, said the DOE was moving too slowly. *The Columbian* [Read more](#)

### USA: SHELL'S ARCTIC CHALLENGER TO BURN OIL SPILLS, AS SOLUTION TO THE POLLUTION



*Illustration of Shell Oil's Arctic Challenger flaring off oil and gas recovered from an underwater hydrocarbon spill in the Arctic. Image from Superior Energy's online animation promoting the project to the public.*

A vessel that is part of Shell Oil's \$5-billion drilling plans to tap the colossal oil and gas reserves in the Arctic sailed into the Port of Vancouver earlier this month, the Vancouver Observer has learned. The arrival comes amid questions about the ship's oil-spill-clean up tactics, as well as scientific predictions that 2014 may have been the hottest global temperature year on record.

The Arctic Challenger went into Seaspan's dry dock in Vancouver two weeks ago for systems work. The vessel represents the

multinational energy corporation's hopes for demonstrating its technical know-how for cleaning up underwater Arctic oil spills.

In what the company says is an "unlikely" event of an underwater oil and gas blow out from its drilling operations, the ship would flare off the recovered hydrocarbons into the air. *Vancouver Observer* [Read more](#)

### USA: \$300 MILLION GREAT LAKES BILL STALLS IN SENATE

December 17 - A bill that would have continued a Great Lakes environmental cleanup program for five more years has stalled in Congress.

The House approved the Great Lakes Restoration Initiative extension last week. But the Senate adjourned Tuesday night without taking it up, meaning the issue is dead until the next session begins in January.

Congress has spent more than \$1.6 billion on the program since President Barack Obama started it in 2010. It has funded projects to battle invasive species, clean harbors and rivers fouled with toxic waste, upgrade wildlife habitat and reduce nearshore pollution that causes harmful algae and beach closings. *The Alpena News* [Read more](#)

### USA: DUKE AGREES TO CLEAN UP THE LAST OF SOUTH CAROLINA'S COAL ASH PONDS

December 18 - Duke Energy is joining other South Carolina utilities in agreeing to clean up toxic coal ash that has polluted groundwater and threatened rivers across the Palmetto State.

Duke will dig out and remove more than 3 million tons of contaminated coal ash from its Lee power plant in Anderson County, a site where the stability of dams that contain the refuse first arose in the mid-1980s.

Thursday's announcement by the nation's largest power company means that every major ash waste lagoon in South Carolina now is targeted for cleanup, making the Palmetto State the first in the South with such plans, environmentalists said. Duke's plan is to put the ash in landfills to reduce the threat of lagoon leaks and spills. *The State* [Read more](#)

## Other news reports from around the world (continued)

### USA: INTERVIEW: OIL SPILL RESPONSE INSIGHTS FROM MSRC'S BENZ: STEVEN T. BENZ, PRESIDENT AND CEO, MARINE SPILL RESPONSE CORPORATION (MSRC)



December 20 - As President and CEO of MSRC, Steve Benz presides over the largest oil spill response company in the United States (and worldwide). In that position since January 1996, he has during that tenure, overseen several critical phases in the Company's evolution. These include a major restructuring in the late 1990s to make it more competitive; growth throughout the 2000-2009 period, including acquisition of several companies; leadership in overseeing MSRC's role in responding to the 2010 BP spill in the Gulf of Mexico; and most recently the large expansion of MSRC's resource base and customer growth in the aftermath of the Gulf spill.

Prior to joining MSRC, Benz spent 16 years (1979-1995) working for British Petroleum (BP), notably serving as Director of Corporate Planning for BP America. From 1991-1995, he was President, BP Shipping US and Corporate Vice President of Alaska Trading and Transportation.

He graduated from Case Western Reserve University with a degree in Chemical Engineering and also earned a Masters Degree in Management Science from Stanford University Business School as a Sloan Fellow. The words MSRC are most often connected to the world of oil spill response, but what Benz and his not-for-profit firm do on a daily basis, encompass much, much more. Listen in this month as he defines the current state of 'response' operations in this hemisphere, looks back at what came before, and then ahead to what might come about next. *Marine Technology News*

[Read more](#)

## ISCO News

### SUPPORT FOR BANGLADESH OIL SPILL

0334 hrs. Sunday 21 December – Capt. D. C. Sekhar, Member of ISCO Council for India advises that he remains in contact with Indian Government authorities. No requirements have been requested as yet.

0747 hrs. Sunday 21 December – Richard Johnson of ITOPF expects to be able to give more information tomorrow. [Richard is an expert on remediation of oil polluted mangrove areas and has been in regular contact with ISCO Secretary John McMurtrie since 12 December]

The most recent news is that the UN team will be travelling to Sundarbans on Monday to carry out site assessments. This is based on a report in today's issue of the Daily Star <http://www.thedailystar.net/frontpage/damage-less-than-initially-thought-56203>

It is not expected that any requests for help will be received until after the team has made its on-location site assessments.

ISCO's planned modus operandi is as follows –

1. Advice from BD on urgently needed equipment, materials or people with specialised know-how will be received by the ISCO Secretariat via email.
2. As advice on requirements is received from BD it will be immediately relayed by email to ISCO members together with the contact details of the person appointed to deal with procurement matters.
3. Members wishing to supply goods/personnel should send the procurement officer details of what they can supply, delivery or travel costs and earliest possible ETA.
3. Members whose offers to supply are accepted will receive purchase orders, advice on to whom invoices should be sent and detailed delivery instructions.
4. This information will be provided by the appointed procurement officer directly to person/company offering support.
5. The designated person responsible for logistics will arrange for rapid customs clearance of goods and onward transportation to locations where needed.
6. In case of requirements for mobilisation of personnel with specialised knowledge, BD authorities will arrange for someone to meet them on arrival at Dhakar Airport, ensure trouble-free immigration (issue of visa on arrival), and arrange for accommodation and onward travel.

It should be understood that ISCO does not have funds available for provision of goods/personnel and will not be involved as an intermediary in any commercial arrangements between providers of support and the purchasing authority. ISCO cannot accept any responsibility for persons, equipment or materials provided – all such matters will be strictly between the purchasing authority and the supplier.

Any further information on the Bangladesh emergency will be relayed directly to members by email.

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### NEXT ISSUE OF THE ISCO NEWSLETTER

Unless something exceptional occurs, the next ISCO Newsletter will be issued on Monday 15<sup>th</sup> January 2015.

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## BITUMENS AND DILUTED BITUMENS FROM WESTERN CANADIAN OIL SANDS: CHAPTER 7



A short series of articles on Bitumens and Diluted Bitumens from Western Canadian Oil Sands contributed by Dr Merv Fingas of Spill Science, Edmonton, Alberta, Canada T6W 1J6 [fingasmerv@shaw.ca](mailto:fingasmerv@shaw.ca)

Merv Fingas MSc PhD Hon.FISCO 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.

### Bitumens and Diluted Bitumens from Western Canadian Oil Sands

This serial covers the topic of bitumen products such as from the Canadian Oil Sands and diluted bitumen products (Dilbit and others). This is the seventh of nine issues by Dr. Merv Fingas, Member of ISCO Council for Canada.

#### 4. Emulsion Formation

Water-in-oil emulsions sometimes form after oil products are spilled. These emulsions, often called "chocolate mousse" or "mousse" by oil spill workers, can make the cleanup of oil spills very difficult. When water-in-oil emulsions form, the physical properties of oil changes dramatically. As an example, stable emulsions contain 60 to 80% water, thus expanding the spilled material from 2 to 5 times the original volume. Most importantly, the viscosity of the oil typically changes from a few hundred mPa.s to about 100,000 mPa.s, an increase by a factor of 500 to 1000. A liquid product is changed into a heavy, semi-solid material. These emulsions are difficult to recover with ordinary spill recovery equipment.

Many researchers feel that emulsification is the second most important behavioral characteristic of oil after evaporation. Emulsification has a significant effect on the behavior of oil spills at sea. As a result of emulsification, evaporation of oil spills slows by orders-of-magnitude, spreading slows by similar rates, and the oil rides lower in the water column, showing different drag with respect to the wind. Emulsification also significantly affects other aspects of a spill, such as cleanup response. Spill countermeasures are quite different for emulsions as they are hard to recover mechanically, to treat, or to burn.

There are four clearly-defined water-in-oil types are formed by crude oil when mixed with water (Fingas and Fieldhouse, 2009). This was shown by water resolution over time, by a number of rheological measurements, and by the water-in-oil product's visual appearance, both on the day of formation and one week later. Some emulsions were observed for over a year, with the same results. The types are named stable water-in-oil emulsions, meso-stable water-in-oil emulsions, entrained water, and unstable water-in-oil types. The differences among the four types are quite large and are based on at least two water content measurements and five rheological measurements. More than 400 oils or petroleum products were studied.

Bitumen and weathered Dilbits do not form emulsions. Lightly-weathered Dilbits can entrain water droplets in turbulent water conditions.

Stable emulsions are reddish-brown semi-solid substances with an average water content of about 70-80% on the day of formation and about the same one week later. Stable emulsions remain stable for at least 4 weeks under laboratory conditions. All of the stable emulsions studied remained so for at least one year. The viscosity increase following formation averages 400 times the original viscosity and one week later averages 850 times the original viscosity.

Meso-stable water-in-oil emulsions are reddish-brown viscous liquids with an average water content of 60-65% on the first day of formation and less than 30% one week later. Meso-stable emulsions generally break down to about 20% water content within one week. The viscosity increases over the initial viscosity on the day of formation averages a factor of 7 and one week later averages 5.

Entrained water-in-oil types are black viscous liquids with an average water content of 40-50% on the first day of formation and less than 28% one week later. The viscosity increase over the day of formation averages a multiple of two and one week later still averages two. Entrained water-in-oil types appear to be applicable to viscous oils and petroleum products, but not extremely viscous products. Dilbits will form entrained water-in-oil types given high levels of water mixing.

Unstable water-in-oil emulsion types or those oils that do not form any of the other three types are characterized by the fact that the oil does not hold significant amounts of water following mixing with water. There is a much broader range of properties in the starting oil than for the other three water-in-oil states.

Stable emulsions, on average, begin at a high level of water content (about 75%) and lose little water over one year. Meso-stable emulsions, on the other hand, begin at about 65% and lose most of this water within a few days. Entrained water-in-oil types pick up only about 40% water and only slowly lose this over one year. Unstable water-in-oil types pick up only a few percent of water and this does not change much over one year. The apparent viscosity of stable emulsion increases over the period of one year and the others generally decline or only increase a small amount. Thus, after a few months, the stable emulsion will have the greatest viscosity. The stable emulsion has about the same viscous and elastic components over the year. All other water-in-oil types show a much greater viscous component than the elastic component.

## Special feature (continued)

If the viscosity of the oil is too high, water droplets cannot penetrate the oil mass to a great extent and thus emulsions are not formed. At moderate oil viscosities, about 1000 to 10,000 mPa.s, the water droplets may be retained by viscosity alone. This is felt to be the origin of the entrained water-in-oil type. Bitumen and weathered Dilbits do not form emulsions. Lightly-weathered Dilbits can entrain water droplets in turbulent water conditions.

### 5 Dispersant Effectiveness and Shoreline Cleaning Agents

Tests have shown that Dilbits show little chemical dispersibility, especially once weathered more than a few hours (Witt O'Briens, 2013).

Tests on oiled tiles shows that Corexit EC9580 is effective for cleaning Dilbit up to about 5 days in the sun and 7 days after oiling. After this time, the bitumen is hard to remove. These and other tests are shown in Figures 15 to 17.



Figure 15 Test of weathered Dilbit gravel penetration – Gainford Tests – May 2013



Figure 16 Removal tests of weathered Dilbit from ceramic tokens – Gainford tests, May 2013

## Special feature (continued)



Figure 17 Successful removal of Dilbit weathered for 4 days

### Reference:

Witt O'Briens, *Dilbit Fate and Behavior, Report of the Gainford Trials*, 2013

## Science & Technology

### WORLD'S MOST ADVANCED OIL SPILL COMBATING SIMULATOR CENTRE GOES LIVE



18 December 2014 – International oil spill management company Aptomar has together with Transas developed the world's most advanced oil spill combating simulator in close cooperation with the North Cape Maritime Training Centre in Honningsvåg, northern Norway.

## Science & Technology (continued)



The North Cape simulator centre has been upgraded to allow onshore and offshore personnel to train and exercise on remote sensing, vessel and equipment manoeuvring, plus sea-air-land tactical collaboration and management.

“This is the world’s most advanced oil spill combating simulator centre. It offers life-like training on all the operational parts of the combating value chain. By training in this environment, where situations and scenarios can be played and re-played, more oil can be combated, faster, and at a lower cost, during a real oil spill situation,” says Lars Solberg, founder and chief sales and marketing officer of Aptomar.

The oil spill combating simulator centre upgrade has been developed by Aptomar, and its partner Transas, with the support of Eni Norge, Statoil, Gdf Suez E&P Norge, OMV Norge and the Norwegian Coastal Administration, through a joint industrial project (JIP). The companies Rutter and Miros have supplied their oil spill detection systems for the simulator centre.

The North Cape Maritime Training Centre in Honningsvåg now contains the world’s only oil spill simulator where onshore and offshore personnel isolated or together, can train in the tools and stages of oil spill combating operations. In the simulator, users can train on remote sensing, vessel navigation, recovery, and onshore-offshore tactical collaboration and information sharing.

The oil spill combating simulator technology allows communication and tactical collaboration between onshore and offshore resources, detection and measurement of oil spills, choice and application of different combating methods and navigation of vessels and other assets. Aptomar’s tactical collaboration and management system (TCMS) is integrated with the simulator. To enhance its life-like capabilities, the simulator offers the possibility to connect the vessel simulator bridges to TCMS’ operation rooms worldwide, to train specifically on second line response and operation management.

“Until now, there has been limited opportunities for cost-effective hands-on training on remote sensing, mitigation and collaboration between onshore and offshore roles and resources for an oil spill combating operation. The North Cape simulator allows individuals or groups to develop this skillset without affecting an operator’s day-to-day operations,” says Lars Solberg.

The North Cape simulator centre and its training programmes will be qualified according to DNV GL’s SeaSkill certification.

For more information, please contact:

Endre Johansen, Corporate Communications AS: +47 41 61 06 05, or email [endre.johansen@corpcom.no](mailto:endre.johansen@corpcom.no)

Alf Havard Jakobsen, Maritim utviklingsleder / Department manager: +47 78 96 50 96, or email: [jaal@ffk.no](mailto:jaal@ffk.no)

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Most recent issue

Current issue

November 2014

December 8 issue

December 1 issue

Fall 2014 issue

November 1-15 2014

No 51 2014

December 2014 issue

November 2014

No 4, 2014

December 17 issue

December 2014 issue

October 2014 issue

December 2014 issue

December 22 issue

December 2014 issue

December 2014 issue

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