ISCO NEWSLETTER

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info@spillcontrol.org http://www.spillcontrol.org

Headline article

ADMIRAL THAD ALLEN: REFLECTIONS ON DWH AND HIS APPRECIATION OF THE CONTRIBUTION MADE BY THE INTERNATIONAL SPILL RESPONSE COMMUNITY

We are pleased to publish these personal reflections specially contributed to the ISCO Newsletter by Admiral Thad Allen, National Incident Commander at the Gulf of Mexico oil spill.

I have had two years now to reflect on the response to the Deepwater Horizon rig explosion, loss of well control, and the eventual capping of the Macando well. The event and the response were extraordinary for several reasons.

First, there was no human access to the well.

Second, we operated under conditions of intense public pressure and uncertainty until the well was capped. We had oil being discharged for 85 days and rising to the surface under varying wind, sea and tidal current conditions. As a result we were forced to deal with hundreds of thousands of patches of oil in different locations simultaneously threatening five coastal states.

Finally, the unity of effort required to co-ordinate the activities of nearly 50 thousand people, thousands of vessels, and the intense simultaneous operations being conducted at the well sire (surface, subsurface, air space) completely dwarfed the existing response doctrine, available resources, and command and control capabilities available.

To be successful, and I believe we were successful, we had to blend the capability, capacity, and competencies of the response community with the unprecedented mobilization of federal, state, and local governments. It wasn't always pretty and it wasn't always easy. One of the key factors in a response that is this large and involves so many players is creating a shared vision and values associated with the response that can serve as the basis for trust and organizational cohesion. I remember telling BP executives that it is hard to out source core values to a third party. Notwithstanding the complexity, the response community came together under difficult circumstances and demonstrated the flexibility and agility that was needed to address the problem.

Headline article (continued)

Major lessons learned for all us include:

(1) the need for greater flexibility to redeploy response resources and a streamlined waiver process for stand by requirements in other parts of the country;

(2) the requirement to automate/digitize/virtualize the incident command process to better manage the response and information;

(3) the ability to provide information to the public to insure transparency and credibility through web based technologies and joint information centers; and

(4) the exploitation of technology to track assets and then push that information to a common operating picture. It may be that new cloud based computing offers a new way to think about organizing and executing operations at this scale.

That said, my thanks to the response community for an extraordinary effort in support of me as the National Incident Commander.

Contributed article

IF WE HAD IT TO DO OVER ?

An article contributed by Dan Sheehan, Member of the ISCO Executive Committee

There are many decisions, actions, and recommendations in golf and in life where we might benefit from a do over. In the oil spill clean up business I am sure that many of readers can come up with an extensive list. I am only going to focus on one today and that involves the separation of oil from a recovered oil/water mixture and how the placement and deployment of specialized oil water storage and separation vessels might contribute substantially to better oil recovery rates.

When oil spill response vessels typically capture a mixture of oil and water the normal proportion of water to oil varies widely but it is not uncommon to have mixtures of 90% water and 10% oil. If a vessel has the ability to decant the water from the oil and then discharge the decanted water overboard, the discharge cannot contain more than 15ppm of oil. In a large spill where Vessels of Opportunity are employed, most of these vessels have neither the ability to decant, nor the ability to separate through an oily water separator. As a result their ability to skim is limited to the tank capacity either on board or in dragoons. As a result a common practice is to offload to a large barge or small tanker and the oily water mixture is taken to port and disposed of. Alternatively the Vessel of Opportunity returns to shore and offloads.

For some spills this is an appropriate and reasonable response however, I contend that in a major spill where a significant number of dedicated response vessels coupled with vessels of opportunity, perhaps a new strategy might be worth considering. Simply put, logistically arrange for barges with decanting and separation equipment to serve as the focal point for a coordinated approach and engagement with the spill. Instead of having to have the response vessels offload to a barge until the barge is full of an oily water mixture of 90% water and 10% oil and then proceed for shore disposal, that they continually decant and separate until the mixture is 90% oil and 10% water then send the barge ashore and reposition another barge.

The Incident Specific Performance Review conducted by the U.S. Coast Guard on the Deepwater Horizon Spill provided a serious examination of both organizational, management, and equipment issues that arose during the spill. One observation was that the Effective Daily Recovery Capacity (EDRC) calculation and assumptions were deemed to be overstated and recommendations were made to reconsider and revise the underlying assumptions. This is a long term process and perhaps part of the calculus could be a reconsideration of tactics as well.

The following information is taken from the Appendix V of the “BP Deepwater Horizon Spill: Incident Specific Performance Review, January 2011”

“Total estimated amount spilled	4,928,100 barrels
Total amount oil recovered directly from wellhead	689,934 barrels or 17%
Total amount oil burned	246,405 barrels or 5%
Total amount oil skimmed	147,843 barrels or 3%
Total amount oil chemically dispersed	394,248 barrels or 8%
Total amount of oil naturally dispersed	788,496 barrels or 16%
Total amount of oil evaporated or dissolved	1,232,025 barrels or 25%

Contributed article

Total amount of oil residual	1,281,306 barrels or 26%
Total number of response vessels	345 vessels
Total number of responders	48,200 personnel
Total number of Coast Guard personnel	7,000 active duty and reserve personnel
Total number of Coast Guard assets	60 vessels and 22 aircraft
Total number of vessels of opportunity	3,200 vessels"

Skimming has traditionally been the accepted first tool of choice in cleaning up and responding to oil spills, yet if you look at the estimates of the amount recovered for the 345 response vessels and the 3200 Vessels of Opportunity, and you acknowledge the limitations of the EDRC assumptions, the amount recovered versus the number of vessels deployed is low. The ISPR provides, in my opinion, a good analysis of contributing factors to this low recovery rate.

The response to the DWH spill was unprecedented in terms of equipment and personnel brought to bear. I am not aware of an overall evaluation the environmental impact of the spill that takes into consideration the carbon footprint of the response. An assumption can be made that if the Vessels of Opportunity had to travel shorter distances to offload their oily water mixture, and if the barges that collected the oily water mixture had the ability to decant, separate and discharge separated water back into the ocean instead of taking the mixture ashore, the overall footprint would be less and the recovery rate could be increased. By subtracting the transit times of the skimmers to shore, theoretically more skimmers could have been available to engage the spill earlier.

[Note from editor: The ISCO delegation to the October 2012 meeting of the IMO Marine Environment Protection Committee will be raising the matter of making it easier for skimming vessels to decant settled-out water and recommending the development of international guidelines for this to be done in an environmentally acceptable way in accordance with the principle of net environmental benefit.]

News

IN BRAZIL, CHEVRON FINE CLOSE TO $25 MILLION FOR RIO OIL SPILL

July 16 - Brazil's National Petroleum Agency, ANP, said it will fine Chevron for its November oil spill below the maximum allowable fine of R$50 million, or roughly $25 million. Given that it is not at the maximum, Chevron is actually being fined less than many people had expected at the outset of the November oil spill.

ANP said on Monday that they will deliver the exact fine to Chevron this week for 25 infractions caused in the oil spill in the so-called Frade Field in the Santos Basin. Between 2,400 and 3,000 barrels of oil seeped into the Atlantic Ocean from a crack in the ocean floor during a drilling miscalculation. No wildlife was believed to have been harmed and no oil washed up on shore, though the spill sparked outrage and lawsuits galore in Rio de Janeiro and basically put its president, George Buck, under house arrest. Buck was not allowed to leave the country during the investigation.

Brazil's environmental protection agency, Ibama, had already fined Chevron R$60 million in November. Total fines have not been paid as the legal procedure continues. *Forbes.com* Read more

NIGERIA: BONGA OIL FIELD SPILL - FG FINES SHELL U.S.$5 BILLION

July 17 - The Shell Nigeria Exploration and Production Company, SNEPCO, has been fined U.S.$5 billion over the massive oil spill that occurred at its Bonga oil field on December 20, 2011.

This was disclosed yesterday by the Director General, National Oil Spill Detection and Response Agency, NOSDRA, Dr. Peter Idabor, when he appeared before the House of Representatives Committee on Environment.

The committee's public hearing was meant to provide key actors in the Bonga oil spill an opportunity to brief the committee on the claims of affected communities.

Idabor said the sum was an "administrative penalty" considering the large quantity of crude oil discharged into the environment by Shell and the impact of the incident on the water and aquatic life.

According to Idabor, the penalty was also consistent with what was obtainable in other oil producing countries such as Venezuela, Brazil and the United States of America.

He explained that this penalty was not the same as compensation since compensation could only be demanded from a polluting company after a proper post impact assessment has been conducted and scientific evidence of impact established.

Idabor disclosed that NOSDRA, Shell and other relevant stakeholders have concluded plans to conduct the post impact assessment on the spill as soon as approval for funding is secured from National Petroleum Investment Management Services.

However, Shell has contested the fine, saying it has done nothing wrong to deserve the fine. In a quick response to Vanguard enquiries, a spokesman for Shell, Mr Tony Okonedo, said: "We do not believe there is any basis in law for such a fine. Neither do we believe that SNEPCo has committed any infraction of Nigerian law to warrant such a fine.

"SNEPCo responded to this incident with professionalism and acted with the consent of the necessary authorities at all times to prevent environmental impact as a result of the incident."

In the heat of the controversies over the spill, especially with regard to third party spill which was cited in several other parts of the Niger Delta, Shell claimed it had sent samples of the spill to laboratories abroad for tests to confirm its liabilities. But till date, nothing was heard of the result of the tests.

The NOSDRA boss explaining the reason for the $5 billion fine noted that "although adequate containment measures were put in place to combat the Bonga oil spill, it, however, posed a serious environmental threat to the offshore environment."

He said: "The spilled 40,000 barrels impacted approximately on 950 square kilometres of water surface; affected great number of sensitive environmental resources across the impacted area and has direct social impact on the livelihood of people in the riverine areas whose primary occupation is fishing.

"It also potentially caused a number of physiological effects on aquatic lives while surviving aquatic species around the spill site would migrate to a farther distance to situate new habitat thereby forcing coastal communities to move deeper into the sea to carry out fishing activities."

Chairman, House Committee on Environment, Hon. Uche Ekwunife had at the opening of the interactive session expressed displeasure that seven months after the spill, there were doubts if Shell carried out a thorough clean-up programme as the oil firm was said to have hurriedly resumed operations on the facility.

She further stated that there were also indications that Shell had refused to accept full responsibility for the incident and had rebuffed claims from communities affected by the spill. *AllAfrica.com* Read more

USA & CANADA: DIESEL FUEL SPILL IN LAKE HURON AFTER BARGE SINKS

MPC sets boom at site of barge casualty in Lake Huron

July 19 - U.S. Coast Guard and hazmat authorities were attempting to contain 1,500 gallons of diesel fuel Thursday after a barge sank in Lake Huron just north of Sarnia.

U.S. and Canadian water plants in the Sarnia-Port Huron area have been notified of the spill and are monitoring water quality. It was unclear if there would be any impact to waters in Lake St. Clair and the Detroit River, said U.S. Coast Guard spokesman Lt. Justin Westmiller.

“We have dispatched our pollution response team,” he said. “We are trying to work all of that out. There is an assessment on what exactly the risks are and how to mitigate those risks.”

The sunken vessel is leaking diesel fuel and at last report, there was about a 100-metre “sheen” on the water, Westmiller said.

A 30-metre Michigan-owned commercial dredge barge called the Arthur J and 38-foot tug boat Madison both sank in the lake at 4:40 a.m. Thursday about five kilometres from the international border and three kilometres offshore of Lakeport, Mich.

The location is about 15 kilometres north of Sarnia. No one was injured. Both vessels were being towed by another boat, Westmiller said. The dredge and tug are owned by MCM Marine Inc. of Sault Ste. Marie, Mich.

The fuel was being used by the company for equipment for a dredging operation at a location near the St. Clair River where the vessels were heading.

The owners of the sunken dredge and tug hired Marine Pollution Control of Detroit which was working with coast guard and hazmat responders to get containment booms into the water to contain the spill.

An investigation into what caused the vessels to sink has already been launched, Westmiller said.

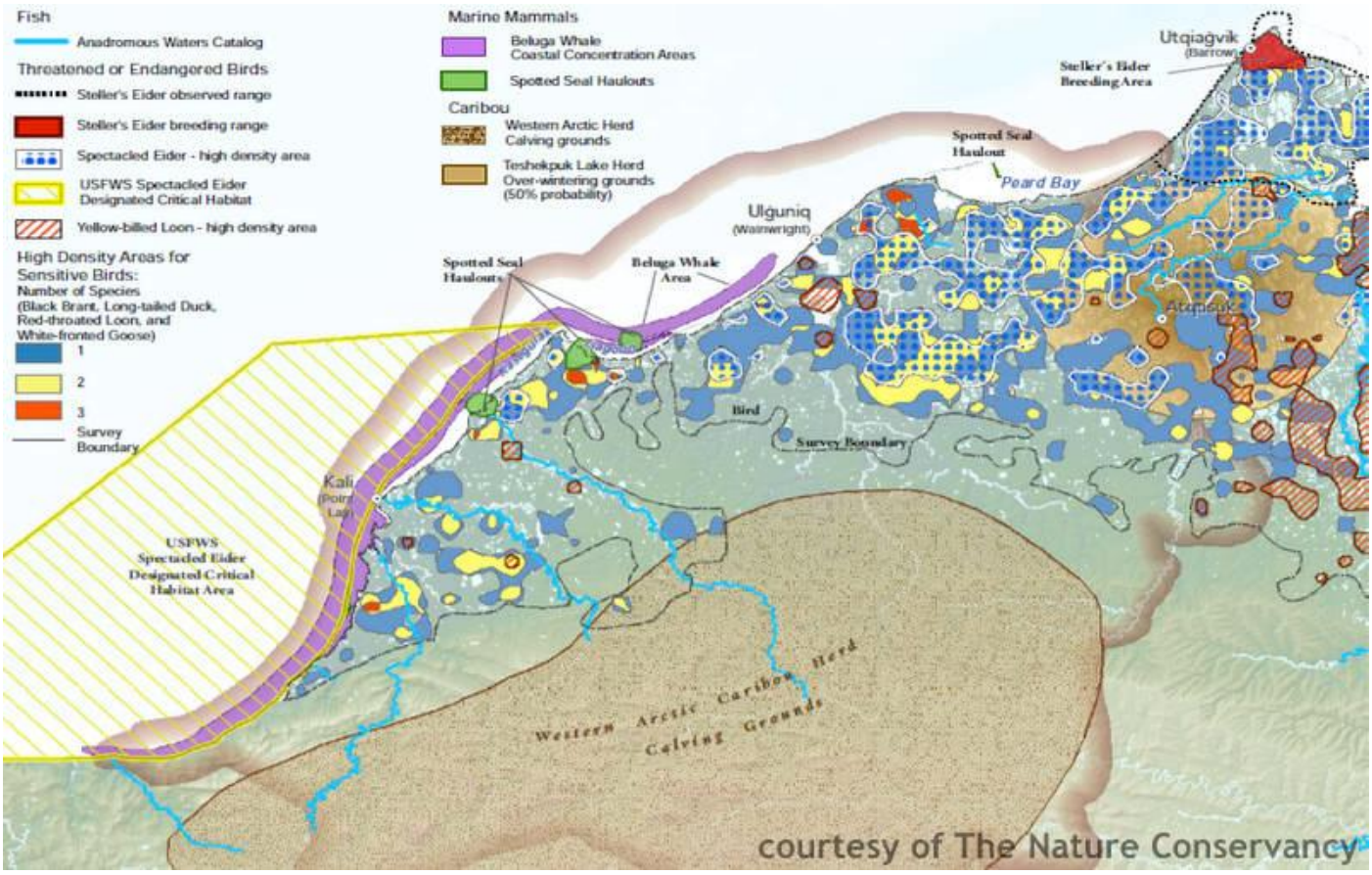
It is the first fuel spill in this area of the Great Lakes since a similar incident occurred in 2010 in Saginaw Bay, he said. Environment Canada is among the agencies that have been notified and is monitoring the spill. The federal agency's role was to provide scientific advice and expertise to lead responders, said spokesman Mark Johnson.

"At this point, the U.S. Coast Guard is leading the overall spill response efforts as the spill took place in American waters and the pollutant remains in American waters," he said.

Environment Canada quickly provided modelling and predictions of the dispersion of diesel fuel, identified the location of environmentally sensitive areas and provided weather forecasts, Johnson said.

"At this point, given local meteorological conditions and the type of pollutant, it is anticipated that much of the pollutant will evaporate," he said. "Environment Canada is closely monitoring the dispersion of this pollutant and will continue to offer advice to the lead agencies." *The Windsor Star* Read more

USA: OFFSHORE OIL DRILLING IN THE U.S. ARCTIC, PART THREE: CONCERNS AND RECOMMENDATIONS



July 19 - On February 17, 2012, the U.S. Department of Interior (DOI) approved of Shell Gulf of Mexico Inc.'s Oil Spill Response Plan (OSRP), the last major hurdle to allowing Shell to move forward with offshore oil drilling in the Chukchi Sea.[i] In theory, Shell has developed a plan to guard against the environmental fallout of a hazardous incident, including a well blowout. Shell has safety vessels standing by, oil collection equipment on hand, and technology ready to drill a relief well in the event it needs to stop a blowout.

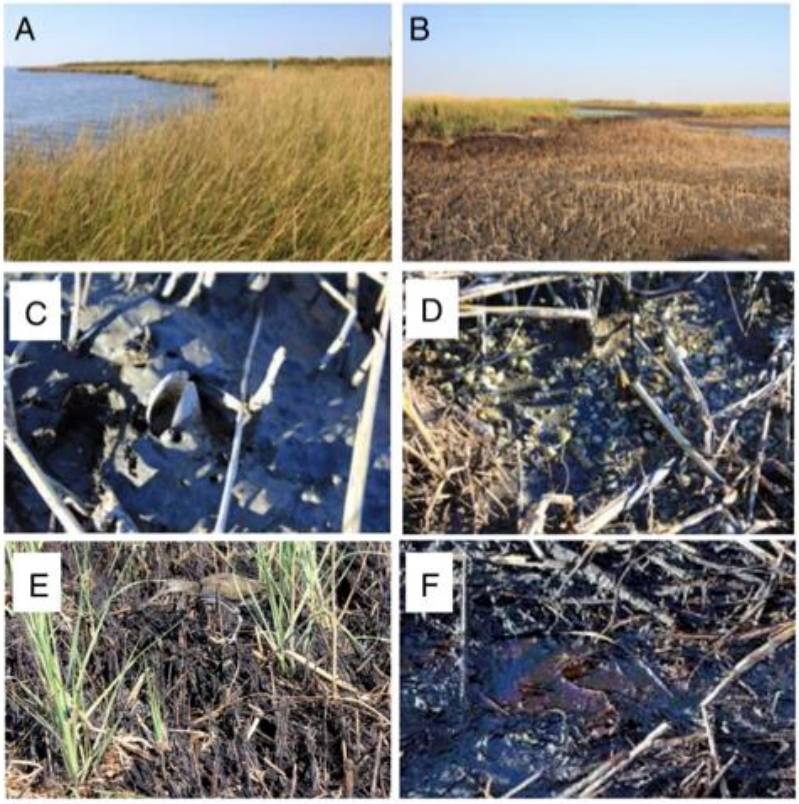
The reformed Department of Interior believes Shell has adequately demonstrated safety preparedness and response, ensuring against another environmental crisis comparable to the BP/*Deepwater Horizon* incident in 2010. However, Shell's OSRP is unproven. It does not fill the fundamental gaps that pervade the regulatory structure of offshore oil drilling, nor does it ensure against a catastrophic blowout. Very little has changed since the blowout in the Gulf of Mexico – there have been only minor

reforms to environmental and safety oversight and no legislative action to address the root causes. Also, the science on Arctic ecosystems remains insufficient, and the effects of such a spill are unknown. Before offshore oil drilling commences in the Arctic, these problems need to be addressed. *The Arctic Institute* Read the complete article The previous articles in this series can also be viewed by scrolling down after you have opened the article.

GULF OIL SPILL SUFFOCATED MARSH GRASSES, ENHANCED EROSION

July 18 - Another oil spill study hot off the presses! This new **Silliman et al. PNAS paper** is looking at the effects of the 2010 Deepwater Horizon oil spill on heavily-impacted salt marsh ecosystems around Barataria Bay, Louisiana. In contrast to **our own badass study** looking at oil impacts on sandy Gulf Coast beaches, marshlands provide a particularly interesting contrast because:

Past studies investigating effects of oil spills on salt marshes indicate that negative impacts on plants can be overcome by vegetation regrowth into disturbed areas once the oil has been degraded (8, 28–30). This finding suggests that marshes are intrinsically resilient to (i.e., able to recover from) oil-induced perturbation, especially in warmer climates such as the Gulf of Mexico, where oil degradation and plant growth rates may be high. (Silliman et al. 2012)



"Picture of (A) reference marsh (B) impacted marsh, (C), dead mussel at impacted site, (D) large pile of dead snails in impacted area, (E) clapper rail foraging on heavily oiled grasses at impacted site, and (F) typical covering of oil residue on the marsh surface at an impacted site." (Silliman et al. 2012)

The finding's aren't surprising. Oil killed stuff. But even after 2 years, there's been more speculation than published research and I think its important to highlight ongoing efforts to characterize the exact ways in which oil wreaked havoc on the Gulf ecosystem.

These data provide evidence of salt-marsh community die-off in the near-shore portion of the Louisiana shoreline after the BP-DWH oil spill because of high concentrations of oil at the edge of the marsh. Specifically, these findings suggest that the veg- etation at the marsh edge, by reaching above the highest high- tide line in the microtidal environment of the Gulf of Mexico, blocked and confined incoming oil to the shoreline region of the marsh. This shoreline containment of the oil may have protected inland marsh but led to extensive mortality of marsh plants lo- cated from the marsh edge to 5–10 m inland and to sublethal plant impacts on plants 10–20 m from the shoreline, where plant oiling was less severe….**These data also suggest that the mechanism of the lethal effects of oil are more likely derived from interference with respiration and photosynthesis than from direct toxicity because plant death only occurred at high levels of oil coverage.** (Silliman et al. 2012) *DeepSeaNews.com* Read the complete article

ALBERTA ANNOUNCES INDEPENDENT REVIEW OF PIPELINE INTEGRITY IN WAKE OF SPILLS, INCREASED SCRUTINY

July 20 - As political support for major pipeline projects wanes in the face of recent oil spills and damning reports, both the Alberta government and the oil industry made moves to quell fears about safety Friday.

Alberta-based Enbridge said it would spend $500-million to redesign the proposed Northern Gateway pipeline system in response to environmental and aboriginal groups' concerns. The announcement came the same day the Alberta government said it would launch an independent review of pipeline integrity and spill management, a process expected to take months.

"The scrutiny is at a level we have never seen before, and I welcome that scrutiny," said Alberta's energy minister, Ken Hughes.

Indeed, the province's system has come under increasing scrutiny over the past few weeks, after an oil spill in the Red Deer River and the publication of a scathing report on Enbridge cast doubt on pipeline companies' claims to competence and safety.

Alberta Premier Alison Redford speaks to reporters in June in front of the Gleniffer reservoir about an oil spill from a pipeline leak near Sundre, Alta. The spill was caused by Plains Midstream Canada, the same company responsible for last year's spill near the northern community of Little Buffalo.

The incidents threaten major proposals such as the Northern Gateway pipeline: Slated to cost $5.5-billion before the announced design changes, the pipeline will ship Alberta bitumen to a deep-sea port in Kitimat, B.C. There, it will be loaded onto tankers for sale in Asia.

In a bid to bolster confidence in Northern Gateway, Enbridge told reporters Friday that it would double the number of proposed inspections, staff remote pumping stations and thicken pipeline walls at river crossings.

"We recognize that there are concerns among aboriginal groups and the public around pipeline safety and integrity," said Janet Holder, an Enbridge executive vice-president.

"With these enhanced measures, we will make what is already a very safe project even safer in order to provide further comfort to people who are concerned about the safety of sensitive habitats in remote areas."

This month, the independent U.S. National Transportation Safety Board said the company handled a major 2010 oil spill in Kalamazoo, Mich., like "Keystone Kops," failing to shut down its bitumen pipeline for more than 17 hours after alarms and a pressure drop indicated a problem.

Alberta's land-locked bitumen sells for a massive discount on global markets due in part to a lack of pipeline infrastructure, which is why the province is keen to see Northern Gateway and the U.S.-bound Keystone XL pipelines constructed. Yet the NTSB report emboldened federal NDP leader Thomas Mulcair to call for a halt to the Kitimat plan. Even the province's conservative Wildrose Opposition leader, Danielle Smith, began suggesting the province look at alternative routes. *National Post* Read more

Training

U.S., MEXICO PARTICIPATE IN BINATIONAL HAZMAT TRAINING

July 13 - Emergency management officials prepared for possible future events involving hazardous materials with a bi-national exercise Friday at Brownsville's El Tapiz building.

A mock chemical accident was staged, with the goal of practicing emergency communications and the sharing critical information between Mexico and the United States. Local, state and federal agencies from the U.S. participated.

"This exercise will allow us an opportunity to practice emergency response and recovery plans and ultimately ensure the continued safety and security of all Rio Grande Valley residents," Esequiel "Zeke" Trevino, master exercise practitioner and supervisory Border Patrol agent, said in a press release.

The Brownsville Fire Department and Emergency Medical Services, several Brownsville Independent School District law enforcement officers, Valley Regional Medical Center personnel and various Border Patrol agents were among those who took part.

Training (continued)

The exercise began with a mock call from Matamoros reporting a dark cloud crossing the border to the United States.
The cloud was reported to be anhydrous ammonia, a chemical both toxic and dangerous to the environment, which had leaked from a rolled-over tanker in Matamoros. The toxic cloud was said to have already killed two farm workers and injured a couple of Border Patrol officers. The Brownsville Herald Read more

UK: UPCOMING DECC TRAINING COURSES FROM OSRL

DECC Level 2, 3 and 4 courses are being scheduled at Aberdeen and Southampton from September 2012. More info

UK: IOPC FUNDS' SHORT COURSE: 2012 DATES ANNOUNCED

Following the success of the IOPC Funds' pilot internship programme in November 2011, the 1992 Fund Assembly have established the 'IOPC Funds' Short Course' as an annual event. In 2012, the IOPC Funds' Short Course will run from Monday 19 to Friday 23 November at the Funds' headquarters in London. The course programme will cover all aspects of the work of the IOPC Funds and the international liability and compensation regime in general and will include practical exercises which allow participants to study a theoretical incident and the subsequent claims submission process. The course is supported by INTERTANKO, ICS, the International Group of P&I Associations, IMO, and ITOPF.

The course is open to a maximum of ten self-funded participants from 1992 Fund Member States, who should be nominated directly by their government by no later than Friday 7 September 2012. Further details can be found in Circular 92FUND/Circ.84.

Cormack's Column

In this issue of the ISCO Newsletter we are printing No. 86 in a series of articles contributed by Dr Douglas Cormack.

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

CHAPTER 86: KNOWLEDGE OF MECHANICAL RECOVERY

Further to using ships of opportunity, WSL continued to develop its prototype Springsweep System which had recovered $9m^3h^{-1}$ of emulsion at the 1976 Ekofisk Blowout, by seeking to extend its pumping capability to higher viscosities, in the knowledge that the optimal viscosity for disc skimmer recovery was 100cSt; that oil mops adsorbed such viscosities as required heat for de-sorption and pumping; that the Weir Boom and its transfer pumps had tolerated viscosities estimated at 5,000-8,000cSt; and that the transfer pumps of the Sweeping Arm had struggled at 15,000cSt (c.f. article 84).

Thus, WSL sought to identify a pumping system which could transfer any pollutant mobile enough to flow over a weir and turned its attention to the slow positive displacement principle as exemplified by the Archimedean screw. However, the performance of this screw in its original form is limited by the back-pressure in the transfer hose when the screw simply turns in the fluid without pushing it forward, a problem overcome by a rotary disc with slots which intersect and seal the screw to prevent backward passage of fluid as pressure builds. However, the particulate-content of coastal and shoreline pollutants requires relatively large tolerances which limit the tolerable back pressure to about 2 bar for low viscosity fluids such as water while the more viscous oils and emulsions for which this system was now intended, require tolerances sufficiently close to tolerate back-pressures up to 10 bar which in turn require transfer hoses of maximal handling-diameter and minimal length. With these considerations to the fore, the GT-185 Archimedean screw pump of Gustav Terling Aktiebolaget achieved *inter alia* the transfer of 15,000cSt oil through 40 metres of 15.24 cm diameter hose at a back-pressure of 4 bar.

In any case, WSL already knew that the nominal transfer pump rates from associated skimmers could be achieved only at equivalent encounter rates; that such could be achieved only at layer thicknesses requiring collection booms; that were such thicknesses to be achieved by booms, skimmers *per se* would be redundant because such layers could be recovered by direct pumping through a floating hose; and that the rate determining factor in overall recovery would be the rate of viscosity-dependent gravity flow of such layers into the said hose, were the pump itself able to transfer to storage at this rate. Accordingly, we decided to determine this viscosity-dependent flow and to identify the most viscosity-tolerant pumping principle.

Thus, we measured gravity-induced, flow as a function of viscosity by recording the time taken for a given quantity of oil to flow through a slot 150mm wide by 100mm deep when totally immersed in the oil. To do this, a slot of these dimensions was cut in the side of a 35litre container, 100mm from its top. By locating the container so that the whole of the slot was immersed in oil floating on water in a sufficiently large test tank, the time taken to fill the container to the lower lip of the slot (28.3litres) could be used to compute the rate in m^3h^{-1} at which oil would naturally flow over a weir, into a hose-end or other inlet of any dimensions when

Cormack's Column (continued)

similarly immersed in floating oil of any layer thickness..

This approach was used to measure natural flow rates as a function of viscosity for comparison with pump rates at these viscosities, and to assess the enhancements in rate achievable by water 'lubrication' in conventional pumps and by air 'lubrication' in vacuum pumps. For reference, it was established that natural flow rates decreased from $35m^3h^{-1}$ at 2,000cSt to zero somewhere in the viscosity range 8,000-9,000cSt. For these experiments, oil and emulsions in the viscosity range of interest were placed to a depth of 200mm on the surface of water contained in a 2.4 metre diameter tank to a depth of 0.7 metres.

The transfer hose had its diameter submerged in the oil layer for transfer to a receiving hopper situated above the 2.4m diameter test tank so that recovered fluids could be returned to the tank for repeat experiments by opening a $230cm^2$ orifice in the hopper bottom.

The pumps used in these experiments were a 3 inch (10mm) Spate with a water pumping capacity of $30m^3h^{-1}$ and a Renvac 3/600 vacuum loader comprising a 45hp Perkins Diesel and an SR 170 Rootes Blower to be used as an air conveyer in which air was to be the conveyer/lubricant by which the oil or emulsion was to drop into the $3m^3$ collection hopper to which the blower was connected, as an air conveyer, by a 3metre long 100mm diameter airtight suction hose, while the hopper was also connected to the weir slot by similar hoses of various lengths and cross-sections during the course of the experiments.

1 The *Rational Trinity: Imagination, Belief and Knowledge*, D.Cormack, Bright Pen 2010 available at www.authorsonline.co.uk
2 *Response to Oil and Chemical Marine Pollution*, D. Cormack, Applied Science Publishers, 1983.
3 *Response to Marine Oil Pollution - Review and Assessment*, Douglas Cormack, Kluwer Academic Publishers, 1999.

Publications

MEDITERRANEAN GUIDELINES ON OILED SHORELINE ASSESSMENT AVAILABLE IN SPANISH

The Mediterranean Guidelines on Oiled Shoreline Assessment is now available in Spanish and can be downloaded from REMPEC's website (www.rempec.org), under the section "Regional guidelines/ manuals"/"Preparedness & Response".

US EPA: TECHNOLOGY INNOVATION NEWS SURVEY

The May 16-31, 2012 *Technology Innovation News Survey* has been posted to the CLU-IN web site. The *Survey* contains market/commercialization information; reports on demonstrations, feasibility studies and research; and other news relevant to the hazardous waste community interested in technology development. The latest survey is available at: http://www.clu-in.org/products/tins/

Events

CHINA: THE 2ND INTERNATIONAL CONGRESS ON QUALITY, HEALTH, SAFETY & ENVIRONMENT IN OIL & GAS

Beijing, 18-19 September, 2012. QHSE Congress is the industry's premier event of its kind in China, providing delegates with an exciting forum where innovative ideas can be shared and discussed, as well as providing the ideal environment for industry networking. More info

SOIL & GROUNDWATER REMEDIATION EVENTS

Upcoming events in USA, France and Germany, compiled by Environmental Expert . View this information

IRELAND: RESOURCE IRELAND EXHIBITION AND SEMINAR

Dublin, 17-18 October, 2012. Momentum is building fast for Resource Ireland the leading event for the Irish environment, water, recycling and waste markets. With a varied exhibition floor, outside demonstration area and comprehensive free to attend seminar programme, this event is not to be missed. More info