Executive Summary

At approximately 1215 hours local time, 22 March 2014, an oil tank barge carrying 1 million gallons of heavy oil, “Kirby 27706” towed by the motor vessel “Miss Susan”, was struck by the 585-foot bulk carrier “Summer Wind”. The collision breached one of the barge’s six fuel tanks causing the release of 170,000 gallons of a marine fuel oil known as RMG 380, a residual and highly persistent marine fuel oil, into the Houston Ship Channel and the waterway between Texas City and Galveston. The collision occurred when the barges being towed by Miss Susan made a left turn to enter the Intracoastal Waterway and were crossing the ship channel. Fog had caused ship traffic to pile up that Saturday at the Texas City “Y” and ship pilots were desperate to get where they were going. At the spill site, 700 yards offshore from the Texas City dike, six crew members of the Miss Susan were injured with non-life threatening injuries. Unified Command was set up in the Galveston Island Conservation Centre comprised of representatives of the Coast Guard, Texas Land Offices, State of Texas and Texas City.

By Sunday, just one day after the collision, oil had spread 12 miles and coated the shoreline on the southern end of Galveston Bay. It then flowed into the Gulf of Mexico with oil traces found more than 200 miles down the coast on North Padre Island. Concerning wildlife, Unified Command stated that as of April 18 the wildlife death toll stood at 129 birds, 32 reptiles, 16 mammals, and four unclassified animals in the Galveston and Matagorda areas. There were hundreds more oiled birds that would likely fly away to die in places where their bodies will never be found, and while introducing the oil to new locations via their migration routes. Affected areas...
also included fragile habitats such as reefs and lagoons, where oyster beds and the associated industry were hit hard. Long-term ecological effects remain unknown at the time of this document.

**Community and Economic Disruption**

The biggest immediate impact of the collision was felt by industry and economy as a whole. The channel in Texas City, about 45 miles southeast of Houston, typically handles about 70 ships and 300 to 400 tugboats and barges per day, making it one of the world’s busiest commercial ports. The accident closed the main artery linking the area’s busy ports with the largest petrochemical complex in the country. At its height, the closure stranded some 100 vessels at the Port of Houston and the Port of Texas City. The key channel wasn’t fully reopened until 5 days later, at which point ships were prioritized for gradual passage to ensure they avoided tainted water. Significant amounts of cargo were placed on hold, and for one company, Buffalo Marine Service, closure of the channel had an economic impact of about $7 million per day per ship. Exxon Mobil Corporation said the channel closure had forced it to reduce fuel production at its 573,000-barrel-a-day refinery in Baytown, Texas.

Companies waiting in the queue for passage were not only industry tankers but also cruise ships that were both stuck docked at port and out at sea. The affected cruise ship companies had varying but similar compensations for passengers. Generally cruises were spent docked, cut short or cancelled. Prorated refunds were offered for the days missed and gratuities and 25% discounts on future cruises awarded, but in some cases they had to be used within the year and were only offered if passengers hadn’t disembarked the ship when initially told their cruise was cancelled.
Passengers could choose to cancel without penalty however, refunds were not provided for flight changes, hotel accommodations, meals, transfers or other incidental costs resulting from the delay.

Figure 4: Passengers wait to board a Carnival Magic cruise ship at the Port of Galveston on Monday; their departure was delayed due to the Houston Ship Channel oil spill

Figure 5: Miscommunication between Royal Caribbean Cruise and thousands of passengers.
The oil spill had a ripple effect across the coast, and in Texas City, where the spill happened, business came to a halt. The Bolivar ferry had to suspend operations with the exception of EMS transit forcing tens of thousands of people to reroute their 3-mile ferry ride into a 120-mile drive. The Galveston Bay’s multibillion-dollar recreational and commercial fishing industry was off limits during peak tourist season. Again effects rippled as the fisherman couldn’t fish, local restaurants menus became limited, and those relying on the dike multiple times a week to feed their families were out of luck. Affected industries had to wait for public perception to normalize before expecting usual amounts of business. Charter fishing businesses and individuals who suffered property losses and other costs, filed a class action lawsuit in federal court against Kirby Inland Marine and Cleopatra Shipping Agency. The defendants failed to exercise reasonable care to ensure that oil would "expeditiously and adequately" be contained in the immediate vicinity of the ships in the event of a collision, the complaint states.

As of Friday April 4, 2014, response workers had removed a total of 200,775 pounds of oiled sand debris from the shorelines of Mustang, North Padre and South Matagorda islands. Approximately 470 response workers remained active on the coastal shorelines, supported by another 78 persons staffing the Incident Command Post in Port O’Connor.

Kirby Inland Marine, owner of the tow vessel Miss Susan and the barge, assumed responsibility for funding the oil spill response. Under federal laws, Kirby is designated as the responsible party, since the spilled oil came from its barge. The carrier Summer Wind, a Liberian-flagged vessel owned by the Greek Shipping Company, Cleopatra Shipping Agency Ltd. Sea Galaxy, is still being investigated.

Strengths noted – Prevention and Response:

- Training and Simulation Program utilized by Kirby Inland Marine
- High level of clean up capability: 24 response vessels skimming the oil, additional 20 response vessels staged and prepared

Figure 6: A barge loaded with marine fuel oil sits partially submerged in the Houston Ship Channel, March 22, 2014
Available safe area for the damaged barge while responders worked, until it could be removed to a local shipyard for further assessment and repair.

High level of equipment ready for clean-up: 90,000 feet of boom staged along Texas City dike for oil recovery, additional 192,500 feet of boom staged for possible deployment and another 20,680 feet ordered immediately.

Timely establishment of a safety zone to restrict vessel traffic in impacted waters – safety of responders and protection of environment.

Air monitoring conducted to ensure responder safety.

Incident response was coordinated by a Unified Command; federal, state and local government agencies, non-profit organizations and the owners of the damaged barge, Kirby Inland Marine. Coordinating agencies included the United States Coast Guard, Texas General Land Office, and Galveston County Office of Emergency Management. Other agencies participating in the response included U.S. Fish and Wildlife, Texas Parks and Wildlife, Galveston City Office of Emergency Management, Texas City Office of Emergency Management, and the Center for Toxicology and Environmental Health.

In March of 2013 as part of the Oil Spill Prevention and Response Program, Texas General Land Office Region 4, the Coast Guard and 200 Responders exercised Unified Command, Incident Command Post operations and tactical deployment.

Good access to information for public through www.texascityYresponse.com.

Good coordination with communities directly affected.

**Contributing Factors & Gaps (Asserted by Authorities/Parties)**

**Prevent:**

- No communication between the barge and vessel pilots
- No meeting and/or crossing arrangements made
- Insufficient use of navigational aids and technology
- No required speed limits in the Galveston Bay and Texas City “Y”
- Reliance on traditional radios to navigate – possible miscommunications
- Exercises did not involve participation of communities at greater distances from the waterway
CASE STUDY – HOUSTON SHIP CHANNEL OIL SPILL, 2014

“Through Training We Remember”

Protect:

➢ Failure to wait for the fog to pass
➢ Failure to obey the “rules of the road”
➢ No evasive actions taken
➢ Fog whistle not activated by Coast Guard (assertion of pilot)
➢ No plan or centralized authority for displaced cruise ship passengers
➢ Unclear policy around fog warning
➢ Ineffective use of Vessel Traffic Service
➢ Faulty navigation equipment: Summer Wind

Response:

➢ Lack of high-level co-ordination between Unified Command and cruise ship companies
➢ Emergency response could not be performed in low-light conditions or overnight – had to wait until morning to continue
➢ No clear travel arrangements or accommodations for cruise passengers
➢ No refund for flights, hotel accommodations, meals, transfers or other incidental costs
➢ Criticism by Cruise Ship passengers of the Port on Social Media and within Online Cruise rating services
➢ No countermeasures to strong wind, currents and/or weather changes - oil surpassed booms
➢ Lack of Co-ordination with communities beyond 50 Km of the incident until pursued by the communities themselves

Figure 7: Command Post and Unified Command briefing. (December 2013 Exercise)
Houston Shipping Channel Community: Port of Houston, Port of Texas City and Galveston Bay

The Houston Shipping Channel is said to be not only one of the busiest U.S. Seaports but also one of the most challenging waterways in the world hosting more than 50 ships and 300 barge movements each day. The channel joins Texas City and Galveston Bay.

The Port of Houston is the 13th busiest in the world and the second busiest in the U.S. It is home to the world’s second-largest petrochemical complex, generating slightly less than $500 million a day in revenue, according to its website.

The adjacent Port of Texas City is a major deep-water port and another one of the world’s largest shipping hubs.

Businesses along the Houston Ship Channel are familiar with delays because of weather-related issues, such as fog. Businesses like refineries, which rely on oil products transported via the channel, hold reserves of oil to keep their operations running smoothly in case of delayed shipments. However, if the delay lasts longer than just a few days, companies will be forced to pursue alternate shipping routes and entire supply chains could be interrupted. Had the closure continued any longer than the five days it is likely that refineries would have used up their reserve oil and fuel prices would have increased significantly.

Investigation, Origin and Cause

As the hearings for the Texas City collision between the Miss Susan barge and Summer Wind began June 1, the general verdict was that it never should have happened. With the new technology and implementation of the rules of the road combined with the U.S. Coast Guard monitoring this should have been avoided.

Documents, data about the ships involved and interviews with captains and government officials suggest that multiple factors likely increased dangers on the day of the accident in an area already considered one of the busiest and most hazardous shipping intersections in the world.

The fog was so severe only a few hours before the collision that both the Galveston-Texas City and Houston-based pilot associations had temporarily suspended operations. Although no fog warning was in effect at the time, visibility was restricted, but the tugboat’s lights were on and conditions weren’t especially
treacherous. It is possible that one - or both - skippers that day were trying to complete their trips faster than they should have, given the conditions.

Kirby Inland Marine, a division of Houston-based Kirby Corp. and owner of Miss Susan and the associated barges, stepped forward as the responsible party for the spill and took a leadership role in clean-up efforts, deploying 60 employees to assist. Kirby Corp. owns and operates one of the industry's top training centers for its employees in Channelview. The center includes a simulation that allows pilots-in-training to virtually steer their ships right through the Texas City Y. The goal of that exercise - which shows just how chaotic radio traffic can get in the Y - is to learn how to keep calm under pressure, avoid accidents and obey the rules of the road.

A special Coast Guard service known as the Vessel Traffic Service provides assistance to captains along the Houston Ship Channel and 12 other areas in the United States. At certain checkpoints captains are required to contact the Coast Guard for briefings on the traffic each vessel will encounter, weather information and, upon request, navigation assistance.

Despite all the technology, captains rely heavily on radios to negotiate passing each other in often rapid-fire exchanges that can be confusing especially with heavy traffic, fast-moving vessels, fog or equipment glitches.

A post-collision inspection of the Summer Wind, operated by Greek shipping company Cleopatra Shipping Agency, found that the vessel had issues with its navigation equipment.

A Coast Guard investigation has yet to determine who was at fault in the collision and investigations with the National Transportation Safety Board are ongoing. They continue to gather information to determine a cause for the collision and find out whether a material failure, misconduct or negligence was responsible and make recommendations to keep it from happening again.
REFERENCES

The preceding Case Study relies upon public domain information available at June 5th, 2013

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Case Study Authors

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Canadian Security Clearance: Level III Top Secret

As Director of Emergency Solutions International, Mark leads ESI associates in conducting risk assessments, training, emergency plan reviews, exercise scenario development, exercise facilitation and evaluation as well as compiling final After Action Review documentation and recommendations. Service has been provided for such critical infrastructure as Port Saint John, Point Lepreau Generating Station, Canaport Liquefied Natural Gas, Saint John Energy, Atlantic Potash Corporation and the Mosaic Company. Mark has conducted over three dozen industrial exercises internationally in Canada, the United States and India.

Prior to founding Emergency Solutions International, Mark served the City of Saint John Fire Department as an active fire fighter, Hazardous Materials/CBRN-E technician, member of the rescue squad and finished his 26 year career in the position of Deputy Chief and Acting Fire Chief of the department.

During his tenure in the Fire Service, Mark worked for over 8 years on the Rescue Squad. The focus of this team at fires was search and rescue of trapped civilians. He was accommodated 5 times for civilian rescues. As a Hazardous Materials Technician, he was chosen as one of the first firefighters in Canada to attend the country’s counter-terrorism program. As Divisional Chief in Charge of Training, Mark was instrumental in designing and implementing the Saint John fire Department’s “Save Our Own” program and Incident Command system.

Mark has served as Incident Commander, Safety Officer and Emergency Site Manager at a number of serious incidents. On several activations of the Saint John Emergency Management Organization, Mark has fulfilled the roles of Fire Services Representative and Manager of the EOC. In the final year of service with the City of Saint John, he was the Director of Saint John Emergency Management Organization.

In relation to our nation’s preparedness: Mark has completed advanced training at CFB Suffield and has served through the Centre for Security Science as a Senior Special Advisor in the area of Chemical, Biological, Radiological, Nuclear and Explosive response. In this role Mark has successfully completed projects related to implementing Capability Based Planning within the public sector; specifically in the areas of conducting Consolidated Risk Assessments through identification of full spectrum threat scenarios. Further to the Consolidated Risk Assessments, Mark has facilitated and produced Capability Analysis/Gap Analysis within the provinces of Nova Scotia, Newfoundland & Labrador and Prince Edward Island.

Mark obtained his Bachelor of Business degree in 1998 and has completed the Dalhousie University, Certificate in Incident Command, the Canadian Association of Fire Chief’s “Chief Fire Officer” designation (CFO) and the British: Institute of Fire Engineer’s “Member’s Level” designation (MI.FireE) award. Mark has completed LNG Suppression Training at Texas A&M, has studied Incident Command at the U.S. National Fire Academy and also the Leadership in Crisis program at Harvard University.
CASE STUDY – HOUSTON SHIP CHANNEL OIL SPILL, 2014
“Through Training We Remember”

Sarah McLaughlin, BSc Hon. Bio
Sarah graduated with a Bachelor of Science from the University of New Brunswick (Fredericton) in May of 2013. She completed a first class honours in Biology. Sarah’s studies focused on environmental conservation and marine biology. Admission to the UNB Biology Marine Block semester research experience provided hands-on fieldwork through Atlantic coastal ecology, the biological pros and cons to sustainable pilot-scale and commercial aquaculture practices, and ecological processes driving marine plant and animal distributions. Top of the Class Performance was awarded with a membership to the Aquaculture Association of Canada. While at UNB Sarah also completed a six week independent project examining the effects of exogenous steroidal chemicals, that make their way to our aqueous environments primarily via wastewater, on secondary sexual characteristics of male tropical fish species. As well, she participated in a water quality analysis of Corbett Brook in Fredericton and the effects of industrial development on the surrounding area.

Emergency Solutions International recognizes the importance of working with respect for our surroundings. Sarah lends her scientific background and expertise to our many projects where environmental issues must be considered. Particular attention is given to the interface between industrial hazardous materials and community risk.