Oil Transportation
Risks and Emergency Response Problems

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GREAT LAKES AND ST. LAWRENCE CITIES INITIATIVE,
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Oil Transportation: The Risk Problems

- Accumulation of risk in time and space
- Risk sources (hazards)
- Risk consequences
- Dynamic risk agent
- Risk owners vs risk bearers
- Risk and climate change factor
- Risk assessments
- Risk and regulation
- Risk acceptability
Accumulation of Risk in Time & Space
## Risk sources (hazard)

<table>
<thead>
<tr>
<th>Transportation Mode</th>
<th>Average Product release per year (gallons)</th>
<th>Release per incident (gallons)</th>
<th>Release per billion ton-miles (gallon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>477,558</td>
<td>687</td>
<td>13,707</td>
</tr>
<tr>
<td>Rails</td>
<td>83,745</td>
<td>1,688</td>
<td>3,504</td>
</tr>
<tr>
<td>Pipelines</td>
<td>6,592,366</td>
<td>19,412</td>
<td>11,286</td>
</tr>
</tbody>
</table>
## Risk sources (consequences)

<table>
<thead>
<tr>
<th>Transportation Mode</th>
<th>Average fatality per year (gallons)</th>
<th>Release per incident (gallons)</th>
<th>Release per billion ton-miles (gallon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>10.2</td>
<td>687</td>
<td>13,707</td>
</tr>
<tr>
<td>Rails</td>
<td>2.4</td>
<td>1,688</td>
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<td>19,412</td>
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</table>
Dynamic risk agents

- Water temperature
- Weather conditions

Class A (Light, Volatile)
Class B Oils are less toxic
Class C (Heavy, Sticky)
Class D (Nonfluid)

Weather a concern as oil spill cleanup efforts continue

Wednesday's forecast calls for rain, choppy waters

Author: Amanda Perez, Reporter, aperez@click2houston.com
Jill Courtney, Sr. Web Editor, Click2Houston.com
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“Overall, we conclude that climate change and extreme weather events represent a real physical threat to the oil and gas sector, which needs to take climate change seriously, assess its own vulnerability, and take appropriate measures to prevent or mitigate any potentially negative effects.
Risk Assessments!

The conclusion of this report is that:

1. “Enbridge’s oil spill risk assessment contains methodological deficiencies and does not therefore provide an accurate assessment of the degree of risk associated with the ENGP”.

2. The risk assessment in this report also concludes that the ENGP has a very high likelihood of a spill that may have significant adverse environmental effects.
Risk and Regulation!? 

Industry Regulation Index

Number of self-reported oil spills by selected companies, 2001-2010

Shapiro et al., 2013

Jedrzej, 2012

False sense of compliance
Risk acceptability

Who are the stakeholders?
What is the acceptable level of Risk?
Oil Spills: The Response Problems

- Large risks versus limited capacities
- Small communities facing large risks
- Response Time
- Location of response equipment and teams
- Corporate Response plans
- Confusion in disaster response
- Coordination
Large risks versus limited capacities

“Internal government audits of the Canadian Coast Guard’s capacity to monitor and respond to a marine oil spill found a system that was outdated, disorganized and in need of an overhaul. 2012
Big risks small communities

![Bar chart showing the number of inland crude oil spills near communities of different sizes.](chart.png)
Response Time

Still many highly vulnerable areas out of reach in timely manner (US regions)
Location of response equipment and teams CCG

The most important factor oil spill cleanup costs is location

A complex factor involving geographical, political, and legal considerations.
Location of response equipment and teams-ENBRIDGE
Corporate spill response plans?!

• Errors in response plans
• Boilerplate
• Too optimistic
  – BP plan “predicting” that no oil would come ashore
• Unsound spill-volume measurement techniques
• Underestimated impacts
  – This plan was unchallenged by the MMS.
Confusion in disaster response

• Too many regulations
• Too many stakeholders
• Which laws and regulation is applied?
  – The states seemed to be confused by the two regulatory regimes. In Louisiana, “Governor Bobby Jindal’s advisors reportedly spent days determining whether the Stafford Act or the NCP applied” (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling 2010, 19).
Coordination system

• Who should be consulted?
  • First, Governor Jindal and others complained that the federal government insufficiently coordinated with and consulted state governments.

• Federal government’s “bureaucracy” on state/provincial and local self-help efforts

• Boom wars (a visible evidence of action)

• Who is in charge?

• Declare state of emergency or not?

(National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling 2010, 20).
Thank you for your attention

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