



# LESSONS LEARNED

Environmental  
Incidents

2010



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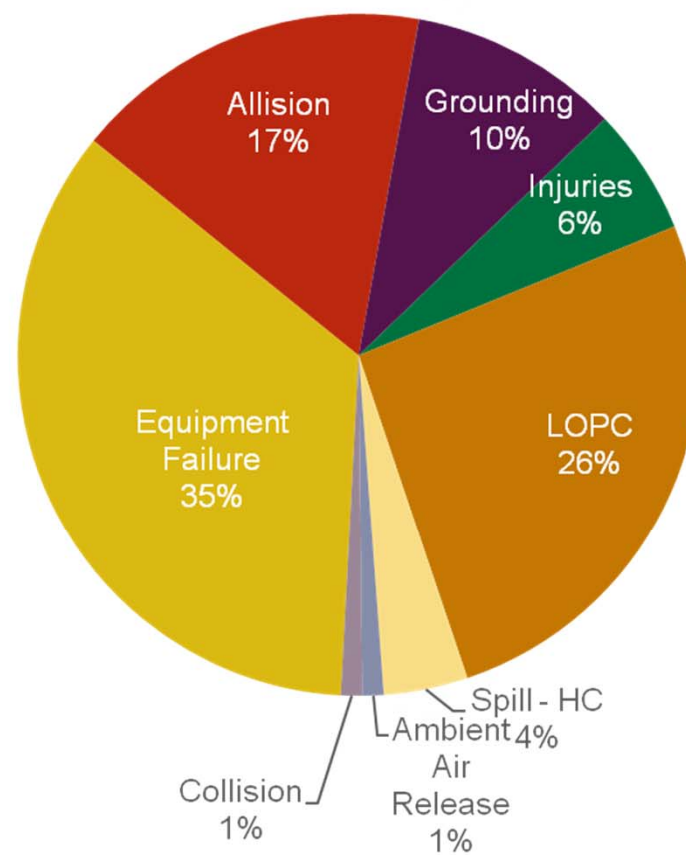
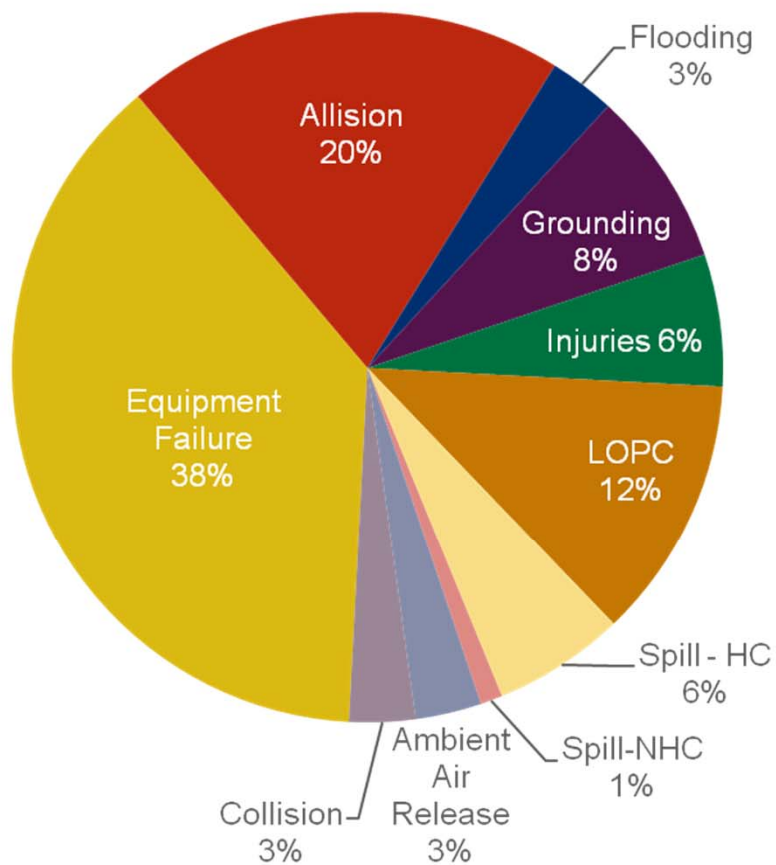
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# INTRODUCTION

This Lessons Learned focuses on the learnings from Losses of Primary Containment (LOPC) and spills experienced in 2010. The marine incidents discussed in this document involved Shell-chartered vessels, which were not under Shell's operational control, and/or Shell terminals in North America. A summary of each incident, redacted to protect the identities of the parties, accompanies this presentation.

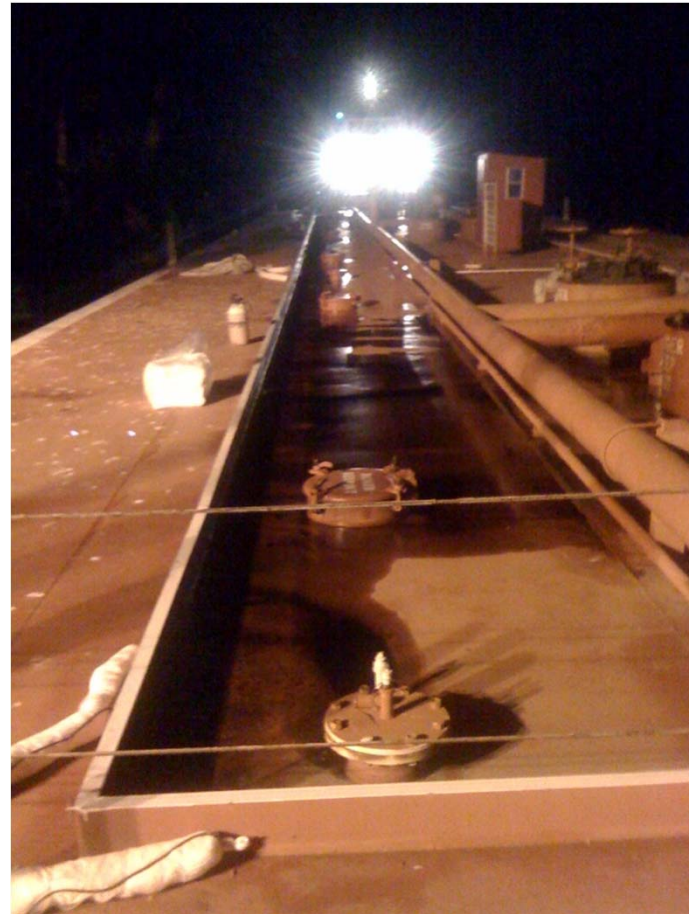
# WHAT HAPPENED: 2009 VS. 2010

LOPCs increased while the number of transfers/barrels transported has not.



## WHAT HAPPENED: 2009 VS. 2010

Spills-to-water decreased, demonstrating the value of full perimeter spill rails. There were 17 spills to water in 2009 with a total volume spilled of 154 gallons. There were eight spills in 2010 with a total volume spilled of less than six gallons.

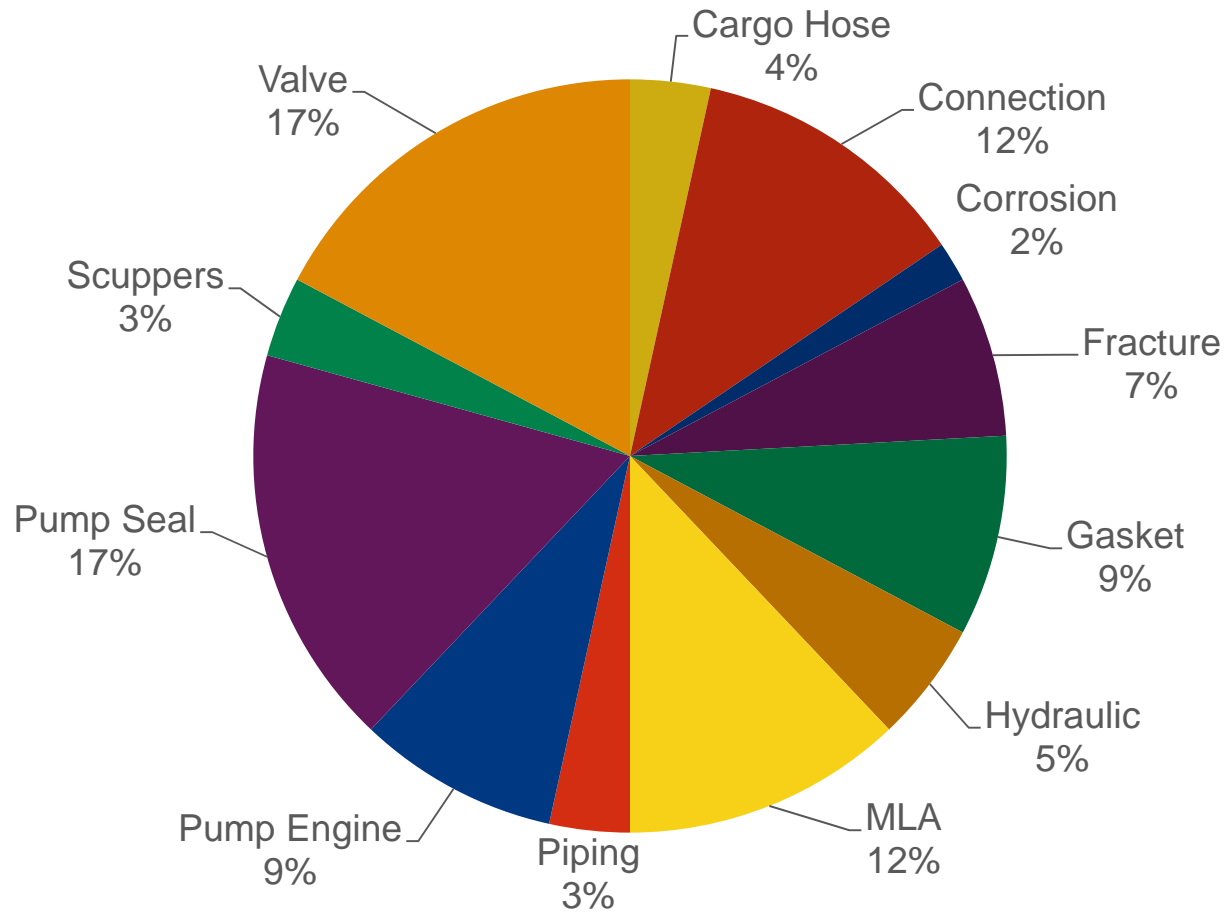


# FINDINGS

Root Cause	2009		2010		Total
	LOPC	Spills	LOPC	Spills	
Communication	1	1	1	0	3
Design	3	0	8	0	11
Error Enforcing Conditions	1	0	0	0	1
Equipment Factors	36	3	38	0	77
Human Factors	14	6	16	6	42
Housekeeping	1	1	0	0	2
Procedures	5	6	4	2	17
Weather	1	0	3	0	4
<b>Total</b>	<b>62</b>	<b>17</b>	<b>70</b>	<b>8</b>	<b>157</b>

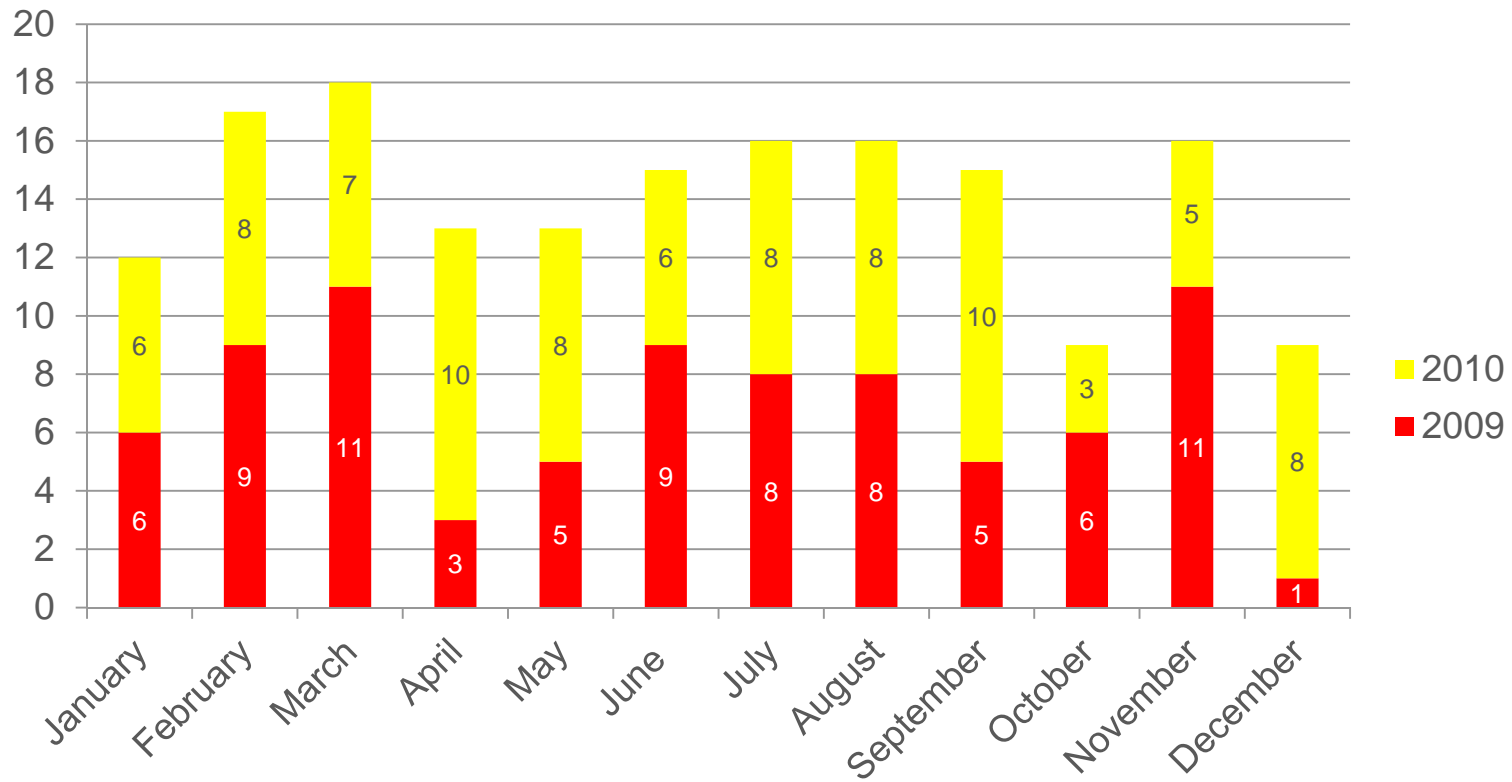
# FINDINGS

Equipment factors contributed to a high percentage of incidents.



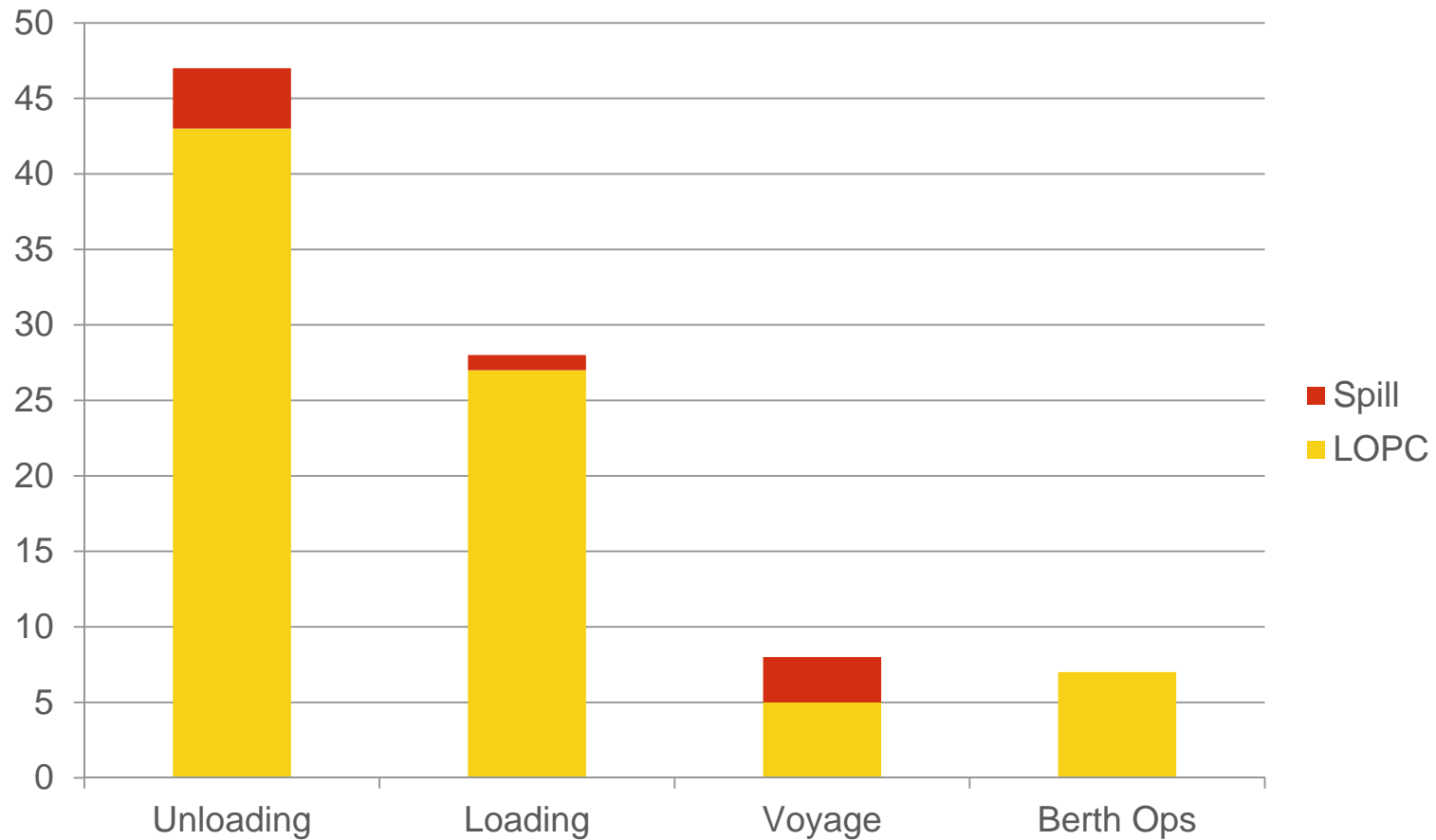
# FINDINGS

There is no evidence of a weather or seasonal trend.



# FINDINGS

Most incidents occurred during transfer operations.



## OTHER FINDINGS

- Time of day was not a factor.
- Type of product was not a factor.
- Weather-related incidents often involved high ambient temperatures causing pressure leaks at weak points in the system.
- Pump seal leaks, hydraulic oil leaks and fuel leaks from spin on fuel filters were the most common equipment failures.
- Many of the pump seal leaks were caused by improper operation and/or priming of the pump.
- Spill rails have reduced spills to water but more attention to scupper plugs is needed.
- Fewer LOPCs would occur if tankermen would “place a hand on every valve” before a transfer or before assuming watch.

## OTHER FINDINGS

- Distractions and interruptions of routine procedures can cause people to forget to perform important steps.
- Pre-transfer conferences require time but are often cursory and lack substance. Weak pre-transfer conferences are exposed when the Persons-in-Charge (PICs) cannot agree on what was discussed after an incident.
- More attention to proper completion of the ship-shore safety checklist is needed. Too often the form is found deficient after an incident.
- PICs are sometimes reluctant to intervene with their counterpart, even when one or the other does not act as agreed in the pre-transfer conference. PICs view their duties and responsibilities as independent of one another, instead of **working as a team.**

# CONCLUSION

The environmental incidents reviewed for this Lessons Learned were preventable. Viewed individually, the learnings from these relatively minor incidents may be hard to discern, but studied collectively patterns emerge that point to needed corrective actions. It is imperative that we take the learnings seriously so we can correct the underlying causes. If we pay attention to the small things we can prevent the big things from happening. One method of accomplishing this is strict adherence to Shell's Golden Rules:

- Comply with the law, standards and procedures
- Intervene in unsafe or non-compliant situations
- Respect our neighbors

Q & A

