



# Oil Spill Summary from California Marine Terminals

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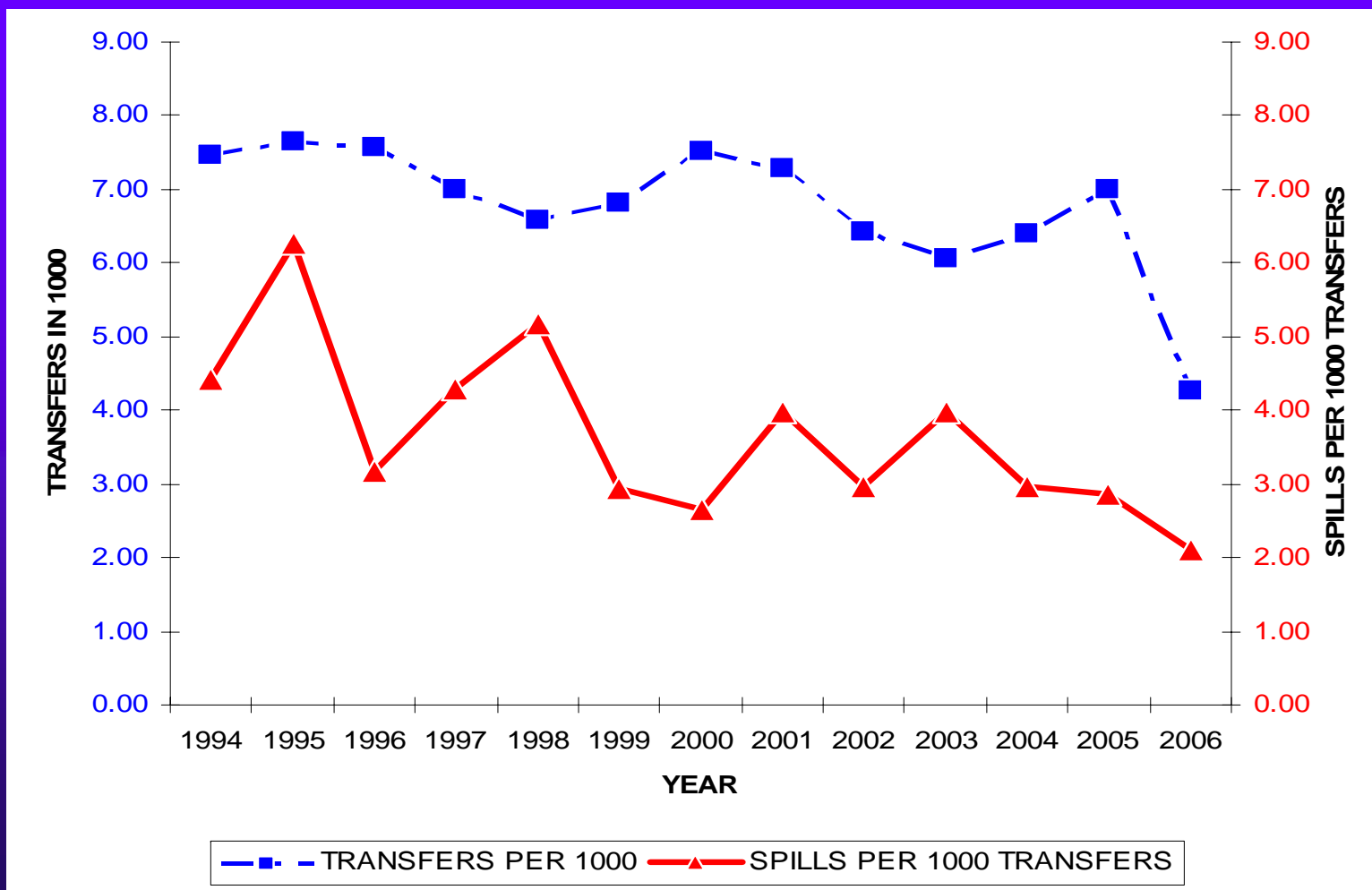


# CSLC Oil Spill Prevention Program Activities

- ◆ Monitor tanker & barge transfers
- ◆ Conduct annual terminal inspections
- ◆ Approve operations manuals
- ◆ Approve terminal training & selection programs
- ◆ Assure MOTEMS compliance
- ◆ Offer Safety Assessments
- ◆ Draw lessons learned from adverse events

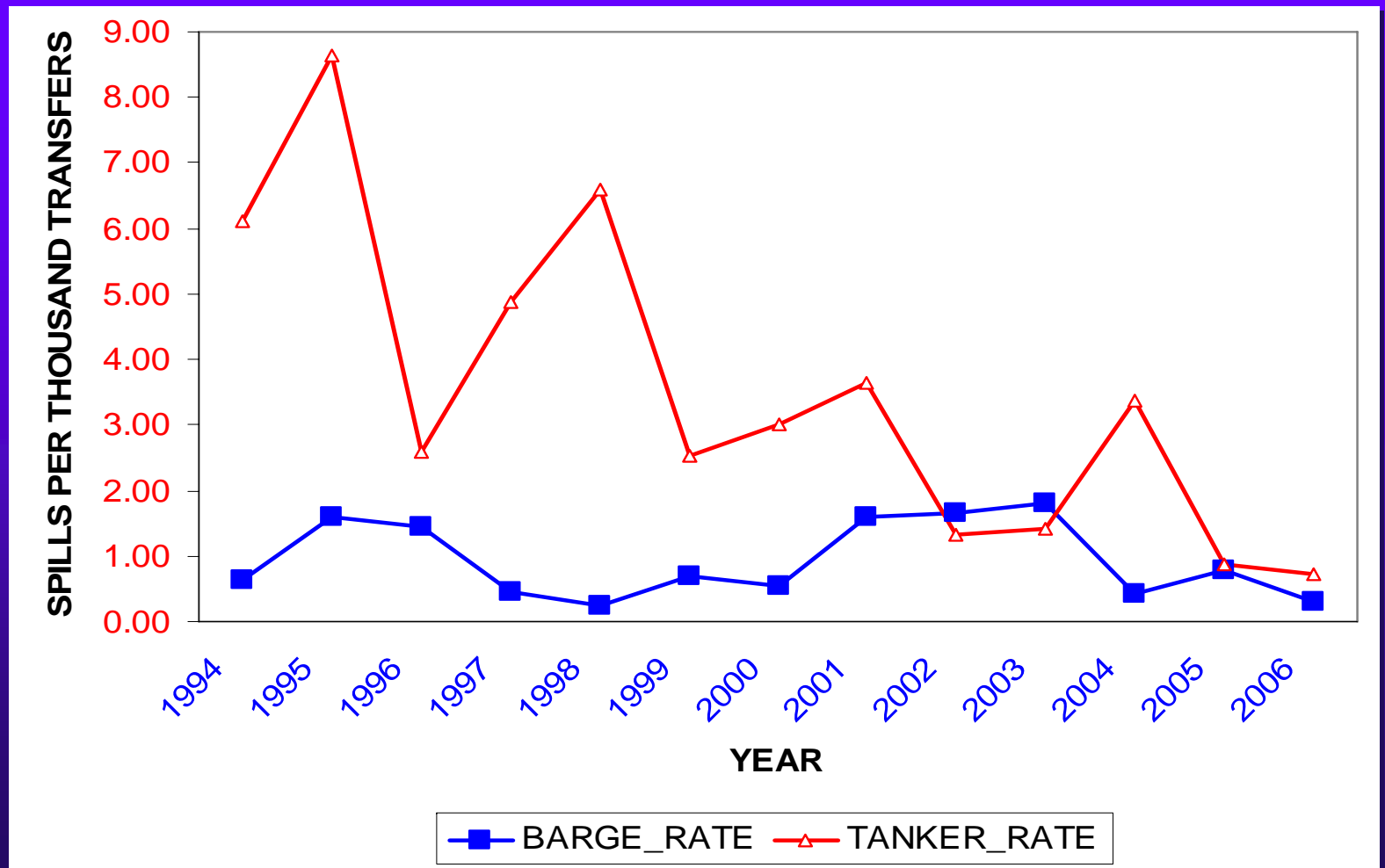


# Transfer Frequency & Spill Rate, 1994 - 2006





# Spill Rate: Tanker & Barge Transfers, 1994 - 2006





## Are events leading to spills 'catchable' during transfer monitoring activity?

- ◆ Data: transfer related spills at marine terminals
- ◆ List of each contributing factor (active failures & latent conditions) for every spill
- ◆ For each factor: Could the factor be observed and prevented by inspection during transfer event (hook up through disconnect)?
- ◆ For each factor: Could the factor be observed and prevented by inspection during pre-transfer activities?



# Are events leading to spills 'catchable' during transfer monitoring activity?

CATCHABLE PRE-TRANSFER	CATCHABLE DURING TRANSFER OPERATIONS		
	YES	NO	TOTALS
YES	8 (6.7%)	20 (16.8%)	28
NO	9 (7.6%)	82 (68.9%)	91
TOTALS	17	102	119

- ◆ Most events and conditions leading to spills are not 'catchable' by monitoring events between hook up & disconnect
- ◆ There may be some benefit to monitoring pre-transfer events and conditions
- ◆ Annual Inspections may provide a better opportunity to mitigate many spill contributing events and conditions



# Comparing Low vs. High Consequence Incidents

- ◆ Do factors that lead to low consequence incidents also lead to high consequence incidents?
- ◆ Which factors distinguish low from high consequence events?
- ◆ Lessons learned for reporting and analyzing incidents

C A T Terminal Spills		Chevron Hawaii (1979)	John Goode (1950)	OMI Charger (1993)	TTT 103 (1986)	Poling #9 (1982)	Sansinena (1976)	Laura D'Amato (1999)
<b>Active Failures ( % of 86 identified)</b>								
Structural/Mechanical failure	39.5			X				
Operator Violation	13.9		X	X				X
Operator Slip/Mistake	46.5			X	X	X		X
<b>Latent Conditions (% of 80 identified)</b>								
Operator Condition/Knowledge	13.8	X	X	X	X	X	X	
Coordination/communications	15.0			X				X
Maintenance/Design	28.8		X	X			X	X
Op. Oversight	18.8		X	X				X
Plans/Procedures/Policy	13.8	X	X	X	X	X		X
Resource Mgt./Safety Climate	10.0			X			X	
Outside Influence – Uncontrollable Event	0.01	X				X	X	
Accepted Risk	?	X		X	X	X	X	





# Comparing Low vs. High Consequence Incidents: Findings

- ◆ Factors leading to low consequence incidents also lead to high consequence incidents
- ◆ Uncontrollable events may be an important factor distinguishing low from high consequence events
- ◆ Chance: often necessary but not sufficient
- ◆ Describing 'accepted' risks provides an opportunity for lessons learned