

# **AIGA 2006 Meeting**

# **Transportation Safety**

## **WORKSHOP**



**Asia Industrial Gases Association**

***12-13 September 2006***  
***Shanghai***

# Professional Product Driver Certification Rollover Prevention Training

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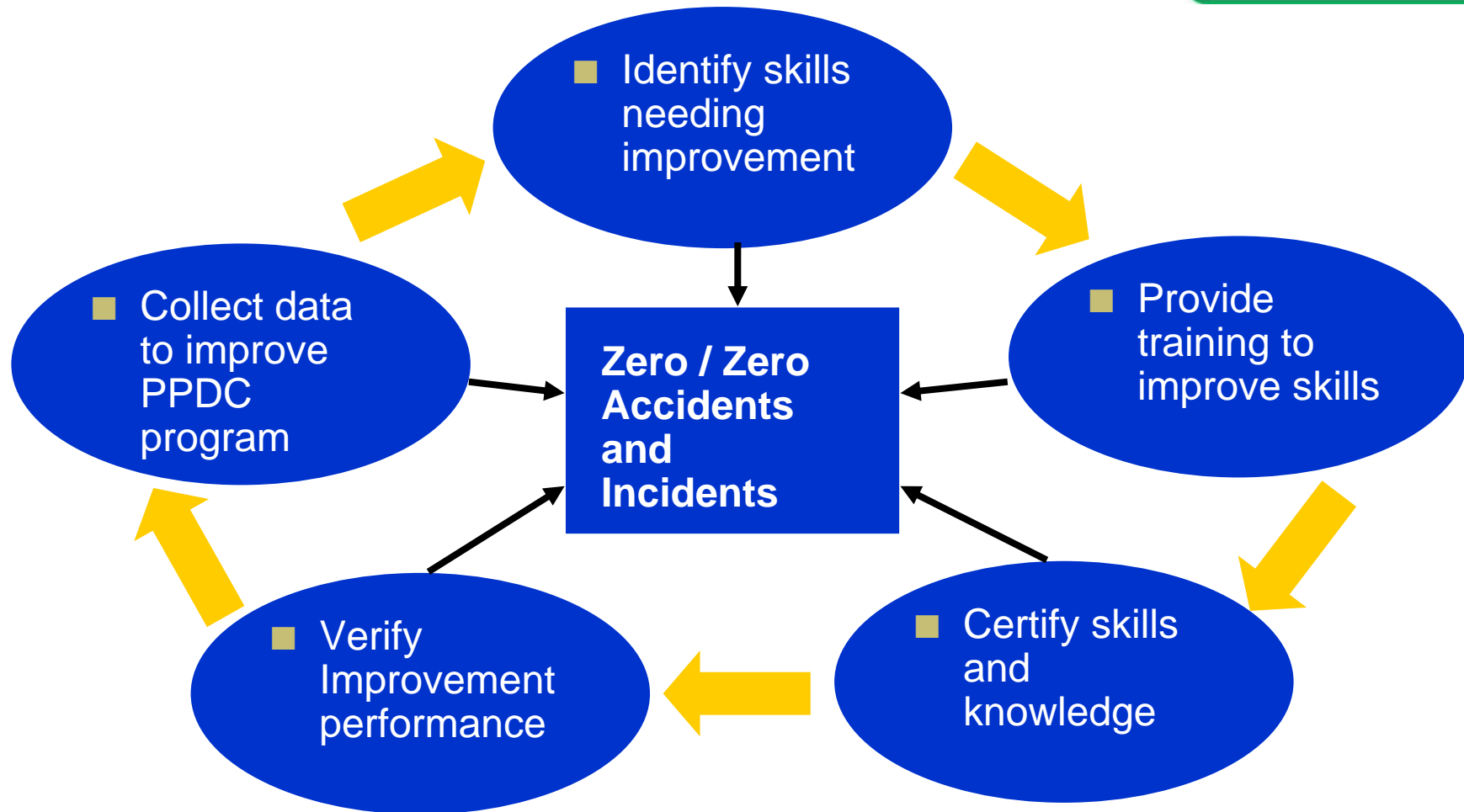
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# Professional Product Driver Certification



# Identify Skills Needed to Improve



# Identify Skills Needing Improvement



- Backing Safety
- Defensive Driving
- Driver Handbook
- Function Specific
- General Awareness, Safety Training, Driver Training
- Pre-Trip Inspection
- Rollover Prevention
- Security Training
- Spill Kit Training
- Trailer Disconnects
- Wellness and Fatigue

■ Identify skills needing improvement

# Provide Training To Improve Skills



- Consistent training
- Dedicated, concentrated and uninterrupted training time
- Opportunity to dig into material
- Verification of skills and knowledge
- Network opportunities for drivers
- Clarification of policies and “whys”
- Certified Trainers
- Improved performance on the job

■ Provide training to improve skills

# Certify Skills and Knowledge



- Each training module requires that the Driver demonstrate there knowledge of the material
  - ✓ Classroom lead instruction
  - ✓ Written test
  - ✓ Hands on practice / demonstration of skills
  - ✓ Observed by Instructors to assure skills are mastered

■ Certify skills and knowledge

# Verify Performance on the Job



- Diver Managers solicited for feedback based on observations
  - ✓ Managers observe Certified Drivers for behavior changes
  - ✓ Managers observe drivers for skills execution
  - ✓ Managers provide feedback to Trainers

■ Verify Improvement performance



# Collect Data to Improve Program



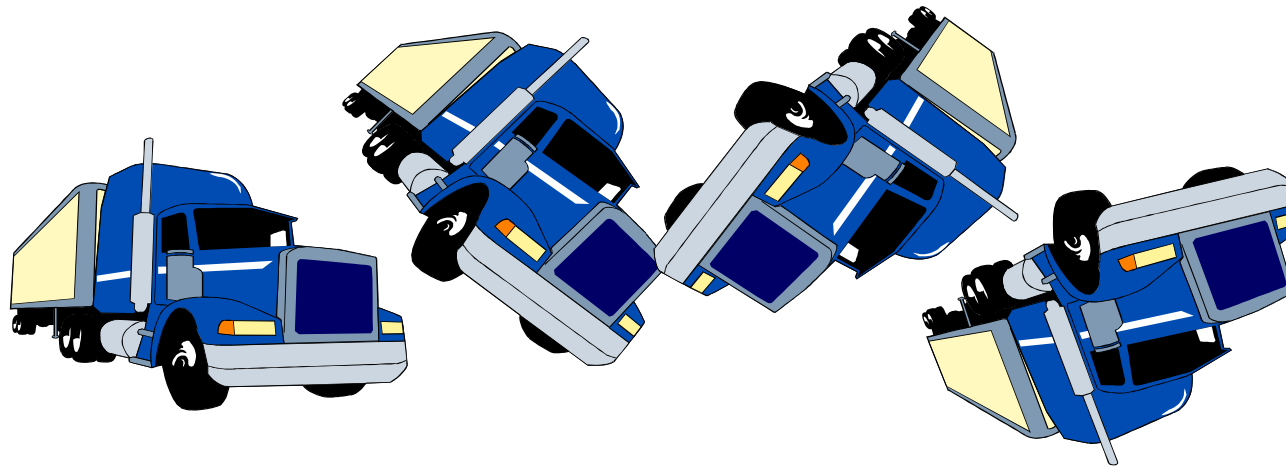
- Improvements to Program based on:
  - ✓ Driver feedback at the end of each day of training
  - ✓ Trainer feedback biannually
  - ✓ Train the Trainer sessions
  - ✓ Manager feedback after each straining session
    - Follow up 90 days following training with questionnaire

■ Collect data to improve PPDC program

# Sample Training



## Rollover Prevention Training



# Training Objectives



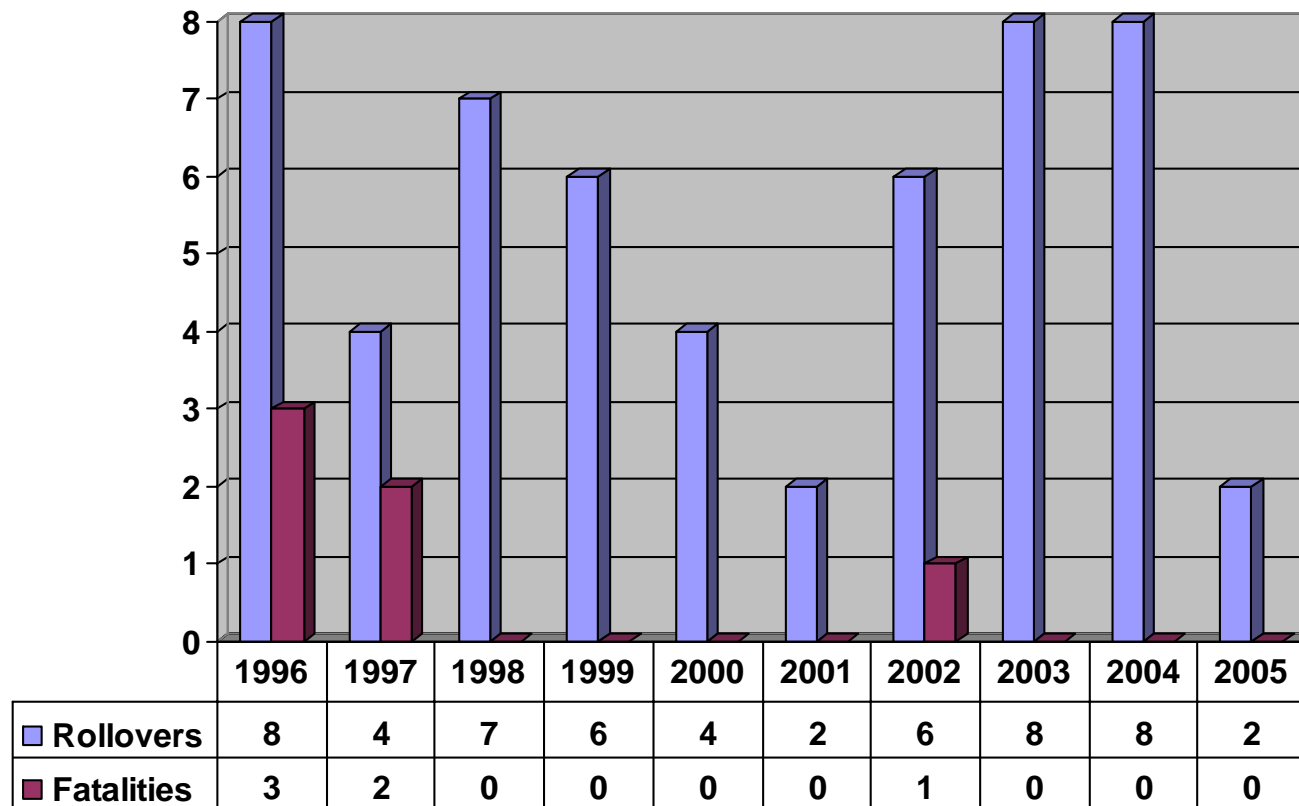
- Identify the impact of rollover accidents
- Describe the factors that cause rollover accidents
- Identify Praxair policies related to the prevention of rollover accidents
- Describe ways that rollover accidents can be prevented

# Operational Disciplines



- Correctly identify Praxair policies that relate to the prevention of rollover accidents
- Consistently and correctly identify driving situations that contribute to rollover accidents
- Consistently apply Praxair policies that relate to rollover accident prevention while driving

# NAIG Rollover Accidents



# NAIG Rollover Accidents Photos and Explanation



# Roadway Design Factors



- Tight curves or turns
- Steep banks next to roadway
- Steep crowns of a hill in a roadway
- Short deceleration lanes before exits
- Curbs on the outside of curves
- Downgrades leading into ramps

***Warning:*** *Slow down and downshift early!*

# Roadway Design Factors

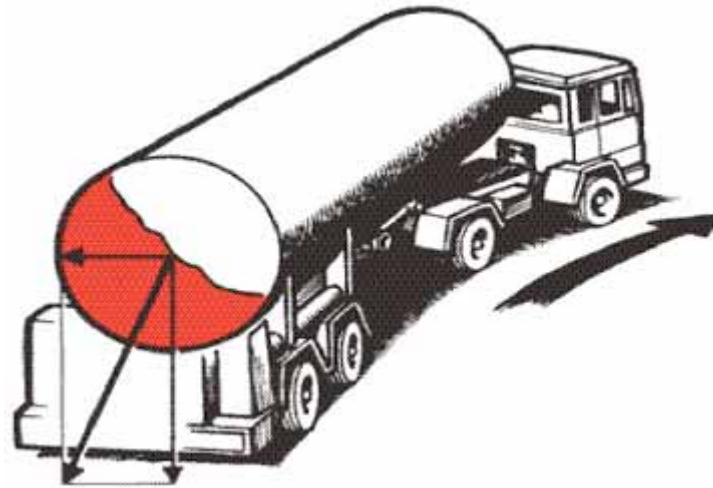


- Posted speed limits on ramps and curves for cars but not for trailers
- Curves with a negative bank
- Drainage ditches close to the road
- Steep drop-offs near edge of road

***Warning:*** *Slow down and downshift early!*

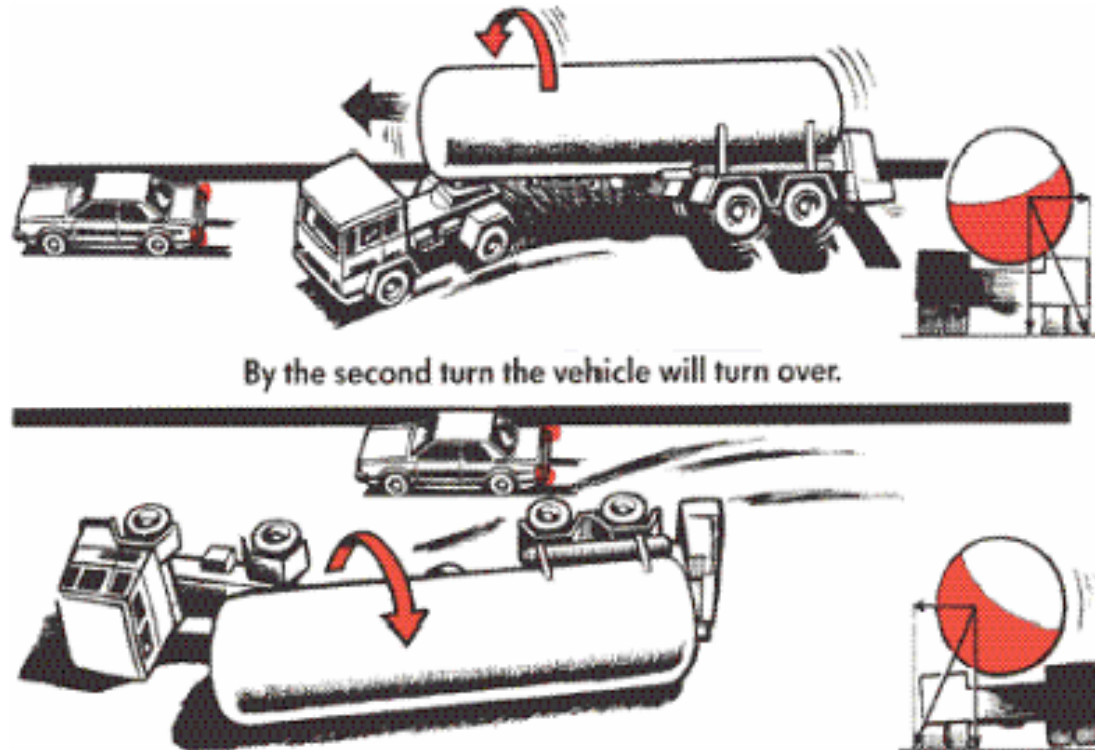


# Surging Liquid



***Remember that unlike a car, a trailer will rollover before it skids!***

# Surging Liquid When Turning



***Remember that unlike a car, a trailer will rollover before it skids!***

# Human Factors

- Complacency
- Distractions
- Fatigue
- Excessive Speed



# Technology

## Roll Stability Adviser / Control



Message center will display rollover warnings, message varies with severity of event

# Equipment Design

## Lower Center of Gravity



- Lower tractor 5<sup>th</sup> wheel
- Lower piping
- Lower "CG" > improved roll stability





# Equipment Design

## Lower Center of Gravity



Low-Rider Oxygen

Standard Oxygen

Standard Nitrogen



# Rollover Prevention

## Driving through Curves



- Reduce speed when approaching a curve
- Downshift before entering curve



# Rollover Prevention

## Applying What You Know



- Praxair's Safety Principles
- Defensive Driving Principles
- Rollover Prevention Training Principles



# Rollover Prevention Policy Compliance



- Seat Belts
- Posted Speed Limit
- On and Off Ramps
- Ramp Curves
- Highway Curves
- Weather Conditions

# Summary



- Identified the impact of rollover accidents
- Described the factors that cause rollover accidents
- Identified Praxair policies related to the prevention of rollover accidents
- Described ways that rollover accidents can be prevented

# Roll-over Prevention Program



## Key Areas

- **Driver training, Operational discipline**
  - ✓ **Driver Certification**
- **Driver fatigue**
- **Equipment design**
- **Equipment maintenance**
- **New technology**
- **Contract negotiations**
  - ✓ **Carriers**
  - ✓ **Equipment vendors**