Legal Weight Truck Tractor / Trailer Testing

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Office of Civilian Radioactive Waste Management

Set The Stage

- Rail is the preferred mode of transport
- Limited legal highway transport required
- LWT transport system designed to transport GA-4/GA-9 cask
- Test objective to ensure LWT transport system is safe, durable and reliable
LWT Test Stages

- Trailer durability: 7/94 to 9/94
- Tractor performance test: 10/94
- Human factors considerations: 11/94
- Over-the-road operational assessment: 12/94 to 5/95
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Briefing Outline

• Where we’ve been
• Where we are
• Where we’re going
• Why human factors?
• What we’ve learned
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Where We've Been

• Tractor inspected/accepted: 11/93
  – Hand receipted to Allied Signal Automotive Proving Ground, South Bend, IN

• Public Road Data: 1 - 3/94
  – 495 miles / 10 hours / 3 states

• Determine durability route: 5 - 6/94
  – Compute compression ratio
Where We’re Going

• Durability test estimated start date July ‘94
  – Scheduled to run 7 - 9/94

• Refurbish tractor and trailer: 9 - 10/94
  – Repair to CVSA standards

• Tractor performance testing
  – Emphasis shift from trailer to tractor
  – 10/94
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Where We’re Going

• Human factors considerations
  – Cab over engine vs. conventional tractor design
  – 11/94

Do we pay a penalty in accelerated fatigue?
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Why Human Factors?

- Safety
- Drivers are weak link
- Culprits
  - Inexperience
  - Driver training
  - Fatigue

60% of accidents are human error
Causes of Fatigue

- Noise levels
- Vibration levels and frequency
- Cognitive task levels
- Air quality and temperature
- Positive posture support
- Lighting levels
- Physical and mental stress
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Human Factors Comparison

- Compare driver response and performance between C.O.E. and conventional tractor

- Perform non-parametric tests to determine S-significance of performance data
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Where We’re Going

- Over-the-road operational assessment
  - “Laps of America” shakedown
  - 16 sites / 13 states / 17,231 miles
  - Driver qualifications
  - 12/94

Best In The Business!
What We’ve Learned

- LWT tractor - shorten frame and split fender

- Compression ratio not uniform at all points on trailer

A Stressful evaluation!
Where Do We Go From Here?

- Validate tractor and trailer design
- Capture design specifications for future procurement