

AFV Driver Training

Presented by

Annaloyd Thomason

10th National Clean Cities Conference

Coordinator Meeting

May 2, 2004

AFV Driver Training

- ◆ **Funded by U.S. DOE**
- ◆ **Developed by Thomason & Associates under AFVI umbrella**
- ◆ **Designed to be a train-the-trainer course**

About AFVI

- ◆ **Non-profit organization**
- ◆ **Mission: to promote the transition to alternative fuels**
- ◆ **Strategies:**
 - **Education and training**
 - **Technical assistance**
 - **Educational events**

AFV Driver Training

- ◆ **Four workshops during first phase**
- ◆ **FY 2004 Training schedule**
 - **Minneapolis May 11**
 - **Denver June 22**
 - **Sacramento June 23**
 - **Washington, DC Aug 18**

Four Separate Courses

- ◆ **Biodiesel (B20)**
- ◆ **Compressed Natural Gas (CNG)**
- ◆ **Ethanol (E-85)**
- ◆ **Propane (LPG)**

Each Course is Structured Similarly

Module 1: Introduction

Module 2: Properties and Characteristics of Propane

Module 3: Propane Fueling Stations and Safety Practices

Module 4: Emergency Action Plan

Module 5: Correct Use of Safety Equipment

Module 6: LPG Vehicle Technology and Safety Features

Module 7: How to Fuel a Propane Vehicle

Introductory Module for E-85

- ◆ Looks like this...

Why E85?

- ◆ **Domestically produced**
- ◆ **Renewable**
- ◆ **Minimal infrastructure costs**
- ◆ **Increasing number of flex fuel vehicles**
 - 3,000,000 FFVs in U.S. at end of MY 2003 (NEVC estimate)



Why E85? - 2

- ◆ **No special fueling training required**
- ◆ **Clean Air Benefits**
 - **20% - 22% less NMHC**
 - **25% - 30% less NO_x**
 - **12% - 24% less carbon monoxide (CO)**
 - **6% - 7% less carbon dioxide (CO₂)**

(sources: Dave Andress, NEVC)

Why E85? - 3

- ◆ **Research at Argonne National Labs found major E85 fuel lifecycle benefits:**
 - **Approximately 73% reduction in petroleum usage per mile traveled**
 - **14%-19% in greenhouse gas emissions per mile traveled**
 - **Approximately 35% in fossil fuel use per mile traveled**

Why E85? - 3

- ◆ Ethanol is non-toxic
- ◆ Ethanol does not contaminate ground water or soil
- ◆ Ethanol used as
 - E85 (85% E85/15% gasoline blend)
 - E70 during winter to reduce
 - Cold start
 - Vapor lock
- ◆ E85 is an EPA Act Clean Fuel

Introductory Module Contents for CNG

- ◆ Looks like this...

Users Need to Know

- ◆ **Properties and characteristics of CNG**
- ◆ **Safe vehicle fueling procedures**
- ◆ **Vehicle fuel tank master shut-off valve**
- ◆ **Vehicle fueling emergency procedures**

Users Need to Know - 2

- ◆ **Fire detection and suppression systems**
- ◆ **Emergency notification procedures**
- ◆ **Emergency evacuation procedures**

CNG Economics

- ◆ **Fleet fuel costs (per gge) about 30% below gasoline – but varies by region**
- ◆ **Fueling station costs \$50K to \$2.5M+**
- ◆ **Vehicle price premium (light duty) \$3K-\$5K**



CNG Economics - 2

- ◆ **Longer vehicle life**
- ◆ **Reduced operating costs (10% to 25% reduction)**
 - **Longer service life**
 - **Extended intervals between required maintenance e.g., oil change**
- ◆ **CNG engines can last longer than gasoline or diesel engines**

CNG Performance

- ◆ **Fuel economy: up to 88% of gasoline's MPGs**
- ◆ **Range: from 65%-100% of gasoline, depending on tank configuration**
- ◆ **Fueling time**
 - **Fast-fill: 5 minutes**
 - **Time-fill 8 hours**



Module 2

Properties and Characteristics of CNG

◆ Learning Objectives

- Understand CNG and how it compares to other fuels
- Be familiar with CNG characteristics
- Understand potential health and safety hazards

Module 3

Fueling Stations and Safety Practices

- ◆ **Learning objectives**
 - **Understand different types of fueling stations**
 - **Be familiar with various components of a CNG fueling station**
 - **Be familiar with safety practices**
 - **Understand purpose and function of emergency shutdown equipment**

Module 4

Emergency Action Plan

- ◆ **Learning objectives**
 - **Know purpose and content of Emergency Action Plan**
 - **Be familiar with signage and emergency equipment**
 - **Understand emergency actions**

Module 5

Correct Use of Safety Equipment

- ◆ **Learning objectives**
 - **Understand how to correctly operate safety equipment**

Module 6

NGV Technology and Safety Features

- ◆ **Learning objectives**
 - **Understand how bi-fuel and dedicated CNG vehicles (NGVs) work**
 - **Understand how NGVs differ from gasoline and diesel powered vehicles**
 - **Be knowledgeable about the four types of on-board fuel storage cylinders**

Module 7

How to Fuel an NGV

- ◆ **Learning objectives**
 - **Be familiar with fueling instructions**
 - **Know how to complete fuel usage records**
 - **Understand fuel nozzle/receptacle operation**



How Can You Get Training in Your Area?

- ◆ **If you want your own class**
 - E-mail us at info@afvi.org
- ◆ **If you want to be included in the next phase**
 - Contact Linda Bluestein at 202-586-6116
 - linda.bluestein@ee.doe.gov.

AFV Driver Training

Presented by

Annaloyd Thomason

10th National Clean Cities Conference

Coordinator Meeting

May 2, 2004