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ABSTRACT

The needs and opportunities in the heavy-duty alternative fuel vehicle training arena were examined in an informal marketing survey. A list of 277 potential respondents was compiled from the 220 individuals in the National Alternative Fuels Training Program database and 57 names identified from journals in the field of alternative fuels. When 2 researchers called the 277 individuals, they were able to obtain responses from 33 individuals. The following were among the conclusions drawn from an analysis of the respondents' comments: heavy-duty alternative fuel vehicles' engines are supplied by relatively few manufacturers; despite the existence of a federal law defining the term "heavy-duty," there is no consensus regarding the term's use; training is being conducted but is being offered to relatively small groups; "serviceability" after conversion, maintenance, and "runability" are issues that have not been resolved in the heavy-duty alternative fuels training field; the need for conversion training will be small because manufacturers will be supplying bi-fuel and dedicated vehicles; and conceptualization of training products and services must be focused on an extremely small niche market. (Includes a list of the individuals contacted.) (MN)

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Informal Market Survey Of Training Issues: Heavy Duty Alternative Fuel Vehicles

Doug Eckert

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Morgantown, WV

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INFORMAL MARKET SURVEY OF TRAINING ISSUES

HEAVY DUTY ALTERNATIVE FUEL VEHICLES

National Alternative Fuels
Training Program

April 4, 1996

Department of Technology Education
West Virginia University
PO Box 6680
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I INTRODUCTION

The National Alternative Fuels Training Program develops and delivers train-the-trainer programs for alternative fuel vehicles. Since its conception, West Virginia University's Technology Education Department has been developing train-the-trainers material. Training materials and programs have been conceptualized based on need. This study was conducted as an informal marketing survey to summarize the needs and opportunities in the heavy duty alternative fuel vehicle training arena.

II EXECUTIVE SUMMARY

The sample population of those familiar with heavy duty alternative fuel issues was identified from two sources. An initial participant listing was taken from the NAFTP (220) database. A second listing was developed from journals in the field of alternative fuels (57). The compiled listing contained 277 potential contacts for this survey. A survey questionnaire was developed for use in the telephone survey. This questionnaire is listed in the appendix. There were no predetermined forced answers in the questionnaire nor in the interviewing process.

Between 8:00 AM, February 26 and 4:00 PM, Friday, March 22, 1996, 131 individuals were phoned from the potential pool of 277 listed telephone numbers. The survey was conducted by two people. The survey resulted in comments from thirty-three people. A list of participants is located in the appendix .

III METHODOLOGY

Of these 131 phone calls, the callers excluded the following: 1) Communication problems, such as disconnected phones, relocated persons, or persons no longer employed; 2) Answering machines connections or no available means to immediately speak with the person; and 3) Person was unavailable at the time of the call. If a participant had moved to a new job, but left a forwarding number, the participant was contacted and that opinion was used in the results (assuming the opinion was not precluded by any of the above screeners). The calls averaged four minutes.

Why NAFTP? In order to do a true survey of the percentage of participants that would have appropriate comments, it would be necessary to obtain a complete list of national experts and take a random sample from it. This list, of course, does not exist. In the haste of trying to find the next best thing, it was assumed that the National Alternative Fuels Training Program database probably contained the largest list of participants.

On the downside, it is necessary to be cautious about generalizing the NAFTP database in order to be representative of a total population. Understand that NAFTP gets most of its participants from people who submit applications through their training office, and their marketing efforts. Thus, the population of the

participants that use the NAFTP may be different from the rest of the national population.

The high percentage of sample participants from the NAFTP list should be considered as a limitation of this study. The initial assumption was that participants should expect the rest of the nation to accept the training of the NAFTP. But while the NAFTP mostly trains trainers, it actually affects the entire nation in filtering training development from within the US. Halfway through the study, it was realized that a broader sample of participants should have been included. Unfortunately, an alternative list of non-NAFTP based participants were not available. Therefore the data is heavily skewed toward attitudes influenced by NAFTP participants.

IV RESULTS BY QUESTIONS

The following data represents comments from individuals in response to survey questions. Question numbers 1 and 2 were simply oriented to telephone greeting and availability to discuss the questions.

Question # 3

I am interested in the application of alternative fuel technologies in the heavy duty arena (diesel, heavy duty vehicles). I understand that this is a developing area and would like to know of people or organizations that are conducting this type of training or development.

There were comments from twenty-two participants concerning this question. Nineteen of the comments were from the NAFTP contact list and three were from the journal contact list.

College/University Contacts

Of the total number of participants, seven recommended contacting specific universities or colleges. All seven of the college recommendations came from the NAFTP contact list. The colleges listed included: Houston Community College, Morris Vo-Tech, Engine City Technical Institute, Ventura College, and College of the Desert.

Business/Industry Contacts

Of the total number of participants, fifteen recommended contacting specific businesses. Twelve of the business recommendations came from the NAFTP contact list, and three came from the journal list. The businesses listed included: Tom Gorman Company, Dallas Northwest Butane, Butane Propane News Magazine, Chevy Dealer, Mack Fernandez, N-tergy Gas Company, Victor Valley, ART Inc., AVP Automotive Products, Wayne Tanaka, Natural Gas Support Team, Southern California Gas Stations, Southwest Research, Clean Air Partners, and NG Support Group.

Engine Manufacturer

Contacts Of the total number of participants, five recommended contacting specific engine manufacturers. All five of the engine manufacturer recommendations came from the NAFTP contact list. These engine manufacturers included: Detroit Diesel, John Deere, Perkins Experimental, Cummins Corporation, and Caterpillar.

City/Utility Contacts

Of the total number of participants, four recommended contacting specific city and utility companies. All four of the city and utility companies recommendations came from the NAFTP contact list. These cities and utility companies included: City of Morgan, South Coast School Board, Pacific Gas and Electric, Brooklyn Union, City of Pittsburgh and Colombia Gas.

Question # 4

Can you describe to me the heavy duty application of alternative fuels? Does this involve the conversion, repair, maintenance or service of the heavy duty applications? (Diesel, heavy duty vehicles)

There were comments from eighteen participants concerning this question. Fourteen of the comments were from the NAFTP contact list and four were from the journal contact list.

What are Heavy Duty Systems?

Of the total number of participants, seven tended to describe heavy duty systems. Four of these descriptions came from the NAFTP contact list, and three came from the journal contact list. The descriptions included: The conversion of school busses and trucks; They run on propane and have a seven liter engine; Conversions of light and medium duty vehicles; They contain dual-fuel fumigation systems with ratios (60-40%); Conversion of stock diesels to Natural Gas; Will be made bi-fuel; Detroit and Cummins fuel metering systems; The retrofitting of engines and the adaptation of carburetors; and use of IMPC0, bi-fuel ratio (70-30%) which increase horsepower 25%.

What is included in the category of Heavy Duty Vehicles?

Of the total number of participants, eight categorized heavy duty vehicles. Six of these categorizations came from the NAFTP contact list, and one came from the journal contact list. The categorizations included: Recent interest in medium duty natural gas vehicles. There has always been an interest in medium duty propane trucks; Ford makes a medium duty truck called a F-700; Has seen school busses and heavy duty trucks around; Consider heavy duty to be 2-tons and above; Heavy duty vehicles should include school busses; heavy duty busses, Peterbuilts, Mid F-700 trucks, light cars, and pickups; F-800, 429 dedicated united, suited back-hoe vehicles and yard trucks; and applications of industrial trucks.

Reasons for not getting into Heavy Duty Vehicles.

Of the total number of participants, four gave reasons for not participating in heavy duty. All four of these came from the NAFTP contact list. The reasons included: Feels that NGVs are not as popular, there is not a demand; The gas company does not want to get involved; Has no fueling points for natural gas; Local stations are not connected; Not doing this because money is too tight; There are people who need servicing of the light duty vehicles (maybe Chrysler); and not looking for heavy duty, prefer the vehicles that are out there right now.

Question # 5

Who would be involved in conducting training in this area so that I could purchase their services? (Who, what, products)

There were comments from eight participants concerning this question. All eight of the comments were from the NAFTP contact list.

Places that Conduct Training

Of the total number of participants, all eight came from the NAFTP contact list. The places listed included: Dealers, trucks, and transports; Utilities that do their own conversions; Domino Ford went to Canada for training; Dayton Power and Light; Gearhearts Inc..; Diesel specialists; WVU; Baton Rouge; Fuel Man; Select Community Colleges offer heavy duty training; Rich Davis AAA; and Is not aware of anyone to purchase services from.

Question # 6

Can you describe the training program, how long it might last, or who the training is conducted for? (What; source)

There were comments from five participants concerning this question. All five of the comments were from the NAFTP contact list.

Description of Training

Of the total number of participants, five provided recommendations on training descriptions. All five of the description recommendations came from the NAFTP contact list. The descriptions included: There is a need for a two day, hands-on

course consisting of four or five students; The focus should be on the mechanics needs, because equipment installations would have been completed already either by the manufacturer or a conversion specialty shop; Develop the material to work with what happens after the installation is done for example: run-ability, troubleshooting, dyno's, analyzers, and regulators. Focus on servicing and maintenance of the vehicle. Emissions testing was also recommended. Other participants either have not paced their programs with the rest of the country, or have set up a class that did not work out as expected.

Question # 7

I am new to the heavy duty applications as you can probably tell from our discussions. I understand that this field is constantly changing. What trends could you describe in the heavy duty diesel alternative fuel training in the near future? (Increasing; decreasing; same; Why)

There were comments from ten participants concerning this question. Nine of the comments were from the NAFTP contact list and one was from the journal contact list.

Trends

Participants offered their insights into what trends are developing in the heavy duty arena. Most comments came from the NAFTP contact list and one came from the journal contact list. These trends include: "What will happen?" after

seeing a presentation at an automotive workshop. They may "still run on CNG, but no longer methanol" was an observation, while the trend in fuel use may go "from natural gas and propane to LNG." There are projects going on now to "reduce smoke through the adaptation of computer controls" to the engine fuel systems. There are "engine series projects" in development also for heavy duty vehicles. Truck dealers are "creating fleet maintenance shops to deal with the trend since there will be little in the way of conversion training there" and a city is installing a "charging system" to accommodate the demand in their municipality.

Comments

A number of participants offered their comments about the survey. All of these came from the NAFTP contact list. These comments are relevant to the development of materials for the training program and include: There is a distinction that needs to be made in the California Smog Program and the F-1 Alternative for the area of heavy duty vehicles. The Air Resource Board "(ARB) and manufacturers are in different categories" of interest and controls in heavy duty applications. You are ahead of yourself in searching for answers to this area. There is a need for servicing and maintenance training at the light and medium weight categories that still has not been satisfied. Another participant advised us to "collect all natural gas information" available before developing the training material. One man stated that he is "getting on the Internet in the next three months" in order to stay abreast of the current information.

V Conclusions

Based on the analysis of data from this informal survey, the following conclusions have been made:

o The infrastructure required for heavy duty vehicles is not as extensive as it is for light duty alternative fuel vehicles.

o Heavy duty alternative fuel vehicles engines are supplied by relatively few manufacturers.

o Although a federal law exists defining what constitutes "heavy duty," there seems to be a lack of consensus among the use of the term " heavy duty . "

o Training is being conducted but offered to relatively small groups.

o Service-ability after conversion, maintenance, and run-ability are issues that have not been resolved in the heavy duty alternative fuels training field .

o There will be little need for conversion training since the manufacturers will be supplying bi-fuel and dedicated vehicles.

o Conceptualization of training products and services must be focused on an extremely small niche market.

SURVEY PROTOCOL

Heavy Duty Survey Questions:

1. Hello, my name is Lori/Doug and I am with the National Alternative Fuels Training Program at West Virginia University. I was given your phone number by the Name or NAFTP after a suggestion that you may be able to help me. Can you spare a few minutes now to answer a few questions?

2. Yes (Go to 3) No. Thank you for your time. Later, not now. When would be a good time for us to talk? Thank you. I will call back at that time.

3. I am interested in the application of alternative fuel technologies in the heavy duty arena (diesel, heavy duty vehicles). I understand that this is a developing area and would like to know of people or organizations that are conducting this type of training or development.

4. Can you describe to me the heavy duty application or alternative fuels? Does this involve the conversion; repair; maintenance; or service of the heavy duty applications? (Diesel, heavy duty vehicles)

5. Who would be involved in conducting training in this area so that I could purchase their services? (Who; what; products)

6. Can you describe the training program, how long it might last, or who the training is conducted for? (What; source)

7. I am new to heavy duty applications as you can probably tell from our discussions. I understand that this field is constantly changing. What trends could you describe in the heavy duty diesel alternative fuel training in the near future? (Increasing; decreasing; same; why)

VI HEAVY DUTY SURVEY APPENDIX

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Rochester Gauges, Inc.
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