

**State of California
AIR RESOURCES BOARD**

Resolution 01-5
January 25, 2001

Agenda Item No.: 01-01-2

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an augmentation request entitled "Optimized Ground Support Equipment Traction Battery Configuration", has been submitted by Electric Transportation Engineering Corporation; and

WHEREAS, the Research Division staff and the Executive Officer and Deputy Executive Officers have reviewed and recommend for funding:

Augmentation request entitled "Optimized Ground Support Equipment Traction Battery Configuration", submitted by Electric Transportation Engineering Corporation, for a total amount not to exceed \$35,000.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Executive Officer and approves the following:

Augmentation request entitled "Optimized Ground Support Equipment Traction Battery Configuration", submitted by Electric Transportation Engineering Corporation, for a total amount not to exceed \$35,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and agreements for the efforts proposed herein, and as described in Attachment A, in an amount not to exceed \$35,000.

I hereby certify that the above is a true and correct copy of Resolution 01-5, as adopted by the Air Resources Board.

Marie Kavan, Clerk of the Board

ATTACHMENT A

INNOVATIVE CLEAN AIR TECHNOLOGIES (ICAT)

PROPOSAL FOR AUGMENTATION “Optimized Ground Support Equipment Traction Battery Configuration”

Background

On May 25, 2000, the Air Resources Board approved a \$229,693 grant under the Innovative Clean Air Technologies (ICAT) program for the project, "Demonstration of the Use of Fast Charged Electric Ground Support Equipment (GSE) as a Means of Reducing Airport Emissions while Minimizing Electrical Infrastructure Requirements." This project is currently underway at Sacramento International Airport, and includes the replacement of all twelve of Southwest Airlines' diesel-fueled baggage tractors with electric versions. In September, the ARB staff agreed to modify the grant so that the grantee, Electric Transportation Engineering Corporation (ETEC), could procure a new, superior battery pack for a thirteenth baggage tractor. Due to the effort necessary to integrate these new batteries into the combined GSE/fast charging system, successful project completion now requires a grant augmentation. The attached budget shows that the project partners would provide more than five times as much funding as that requested from the ICAT program.

Objective

The main technological objective of the original grant is to demonstrate the feasibility of the ETEC's fast charging system. The objective of this augmentation request is to develop, evaluate, and demonstrate a new, superior sealed battery system for the electric baggage tractors.

Expected Results

Under the original grant, a fleet of diesel baggage tractors will be replaced with comparable electric equipment. The proposed augmentation would allow completion of a project with a superior sealed battery pack in an additional baggage tractor. Significant development work is necessary to integrate this new battery pack into the overall system. Successful project completion would result in GSE with lower weight, faster charging capability, higher energy-efficiency, and lower overall cost.

Significance to the Board

Under the current ICAT grant, ETEC will soon start demonstrating its fast charging technology for airport baggage tractors, a type of ground support equipment, or GSE. GSE is responsible for up to a fifth of the emissions from California's airports. Due to its many advantages, incorporation of the new sealed battery pack should significantly enhance the marketability of the ETEC technology. The accelerated replacement of diesel GSE with zero-emission electric GSE will reduce airport emissions. A successful demonstration could lead to conversion from diesel to electric at other airports.

The ARB is finalizing a Memorandum of Understanding with several airlines that would result in emission reductions from GSE at five California airports. A successful demonstration would support this effort. Electric GSE seems to be recognized by the airline industry as the equipment of choice to meet increasingly stringent emission requirements. This project will provide tangible reasons for airline companies to accept the use of fast charged electric GSE. The availability of an acceptable fast charge system would also eliminate the time and expense of massive electrical infrastructure upgrades to support conventional electric GSE charging.

Proponent:
Electric Transportation
Engineering Corporation

Project Period:
12 months

Principal Investigator:
Donald Karner

ICAT Funding:
\$35,000

Cofunding:

Arizona Public Service	\$ 78,150
Electric Transportation Engineering Corporation	\$ 8,650
Sacramento Municipal Utility District (DARPA funds)	\$100,000
Southwest Airlines	\$ <u>7,500</u>
Total	\$194,300

Basis of Indirect Cost Rate: Rates used are within ICAT program limits.

Past Experience with this Principal Investigator:

Experience with this Principal Investigator since the start of this project in August 2000 has been satisfactory.

Prior ICAT Funding to Electric Transportation Engineering Corporation:

Year	1999	1998	1997
Funding	\$229,998	\$0	\$0

BUDGET SUMMARY

Grant Augmentation Request

Electric Transportation Engineering Corporation

Optimized Ground Support Equipment Traction Battery Configuration

<u>DIRECT COSTS AND BENEFITS</u>	<u>ICAT</u>	<u>TOTAL</u>
1. Labor and Employee Fringe Benefits	\$ 28,000	\$ 62,400
2. Subcontractors	\$ 0	\$ 109,750
3. Equipment	\$ 0	\$ 1,500
4. Travel and Subsistence	\$ 0	\$ 4,000
5. Electronic Data Processing	\$ 0	\$ 0
6. Reproduction/Publication	\$ 0	\$ 0
7. Mail and Phone	\$ 0	\$ 0
8. Supplies	\$ 0	\$ 27,300
9. Analyses	\$ 0	\$ 0
10. Miscellaneous	\$ 0	\$ 0
Total Direct Costs	\$ 28,000	\$ 204,950
<u>INDIRECT COSTS</u>		
1. Overhead	\$ 7,000	\$ 24,350
2. General and Administrative Expenses	\$ 0	\$ 0
3. Other Indirect Costs	\$ 0	\$ 0
4. Fee or Profit	\$ 0	\$ 0
Total Indirect Costs	\$ 7,000	\$ 24,350
<u>TOTAL AUGMENTATION COSTS</u>	<u>\$ 35,000</u>	<u>\$229,300</u>

BUDGET SUMMARY

Grant Augmentation Request Combined with Previously Approved Budget

Electric Transportation Engineering Corporation

"Optimized Ground Support Equipment Traction Battery Configuration" and
"Demonstration of the Use of Fast Charged Electric Ground Support Equipment as a
Means of Reducing Airport Emissions while Minimizing Electrical Infrastructure
Requirements"

<u>DIRECT COSTS AND BENEFITS</u>	<u>ICAT</u>	<u>TOTAL</u>
1. Labor and Employee Fringe Benefits	\$ 168,672	\$ 388,703
2. Subcontractors	\$ 56,811	\$ 144,150
3. Equipment	\$ 0	\$ 551,100
4. Travel and Subsistence	\$ 9,000	\$ 35,000
5. Electronic Data Processing	\$ 0	\$ 0
6. Reproduction/Publication	\$ 500	\$ 500
7. Mail and Phone	\$ 0	\$ 0
8. Supplies	\$ 0	\$ 31,300
9. Analyses	\$ 0	\$ 0
10. Miscellaneous	<u>\$ 0</u>	<u>\$ 0</u>
Total Direct Costs	\$ 234,983	\$1,150,753
 <u>INDIRECT COSTS</u>		
1. Overhead	\$ 30,015	\$ 123,784
2. General and Administrative Expenses	\$ 0	\$ 0
3. Other Indirect Costs	\$ 0	\$ 0
4. Fee or Profit	<u>\$ 0</u>	<u>\$ 0</u>
Total Indirect Costs	<u>\$ 30,015</u>	<u>\$ 123,784</u>
 <u>TOTAL PROJECT COSTS</u>	 <u>\$ 264,998</u>	 <u>\$1,274,537</u>