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UNITED STATES GENERAL ACCOUNTING OFFICE

REGIONAL OFFICE

ROOM 1903 JOHN F. KENNEDY FEDERAL BUILDING

GOVERNMENT CENTER

BOSTON, MASSACHUSETTS 02203

August 19, 1975

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Dr. Robert K. Whitford  
Acting Director  
Transportation Systems Center  
Kendall Square  
Cambridge, Massachusetts 02142

Dear Dr. Whitford:

We have completed a review of energy use at the Transportation Systems Center (TSC), Department of Transportation, Cambridge, Massachusetts. The purpose of this review was to find out how effectively Government field installations are implementing the Federal energy reduction program. The review included:

- the results of the energy conservation program,
- the methods used to gather and report data on energy use,
- the management of the energy conservation program,
- the measures taken to reduce energy use in buildings,
- the measures taken to reduce energy used by vehicles, and
- the impact of energy conservation on mission.

RESULTS OF ENERGY CONSERVATION PROGRAM

The TSC complex consists of six buildings. Electricity and steam purchased from local utility companies are the main types of energy used by TSC. Electricity is used for lighting and to power equipment while steam is used for heating and cooling.

In June 1973, the President directed all Federal agencies to use seven percent less energy in fiscal year 1974 than in fiscal year 1973. In October 1974, the President directed the agencies to use 15 percent less energy in fiscal year 1975 than in fiscal year 1973.

During fiscal year 1974 and the first two quarters of fiscal year 1975, TSC used considerably less energy than in fiscal year 1973.

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	<u>Steam</u> (000 of pounds)	<u>Electricity</u> (000 of KW hours)	<u>Gasoline</u> (000 of gallons)
Fiscal year 1973	71,608	12,734	12
Fiscal year 1974	<u>46,399</u>	<u>9,672</u>	<u>9</u>
Amount of reduction	<u>25,209</u>	<u>3,062</u>	<u>3</u>
Percent reduction	35 percent	24 percent	25 percent
Fiscal year 1973 (1st two quarters)	39,922	6,394	7.2
Fiscal year 1975 (1st two quarters)	<u>18,173</u>	<u>4,325</u>	<u>5.9</u>
Amount of reduction	<u>21,749</u>	<u>2,069</u>	<u>1.3</u>
Percent of reduction	55 percent	32 percent	18 percent

#### ENERGY USE DATA

TSC submits energy consumption reports to DOT headquarters quarterly. These reports show the amount of energy used during the current quarter as well as that used during the corresponding quarter in fiscal year 1973. Data for the quarterly reports is obtained from:

- the Facilities Branch, which provides information on the amount of electricity and steam used,
- the Logistics Branch, which provides information on miles traveled by GSA and special purpose vehicles, and
- the Accounting Branch, which provides information on the miles traveled by personal and rented vehicles.

Our comments on the adequacy of the energy use data are presented below.

#### Electricity and steam

The system used by TSC to gather data on the use of electricity and steam is adequate and provides complete and accurate usage information. The amount of electricity and steam used is obtained from monthly utility bills and TSC personnel check the meter readings to ensure the bills are accurate.

Our review showed that TSC's summaries of electricity and steam used during fiscal years 1973 and 1974 and the first two quarters of fiscal year 1975 agreed with the amounts shown on monthly utility bills. We noted, however, that the pounds of steam used is converted to gallons of fuel oil on the quarterly energy consumption reports. We believe this is misleading since TSC does not use fuel oil to generate steam but rather purchases steam from a local utility company.

### Gasoline

The system used by TSC to gather data on gasoline used can be improved. To determine the amount of gasoline used in a quarter, TSC first determines the miles traveled by GSA, special purpose, personal, and rented vehicles. Mileage for GSA and special purpose vehicles is gathered by the Logistics Branch from vehicle logs while mileage for personal and rented vehicles is gathered by the Accounting Branch from travel vouchers. In accordance with GSA instructions and criteria, the miles traveled is then converted to gallons used.

On a test basis, we reviewed records supporting the miles traveled by GSA and special purpose vehicles and noted the mileage reported was accurate. We were unable, however, to verify mileage for personal and rented vehicles without reviewing numerous travel vouchers. The Accounting Branch provided the Logistics Branch with the total mileage for these vehicles each quarter, but did not prepare summaries showing how the total was determined. The mileage traveled in personal or rented vehicles generally represented more than one-half of the total miles traveled in a quarter.

In our opinion, monthly summaries of mileage for personal and rented vehicles should be prepared. Such summaries would not only help internal or external review groups in verifying mileage traveled, but they could also be used by management to identify areas for possible further reduction.

### PROGRAM MANAGEMENT

TSC management has been actively involved in conserving energy since the TSC complex was first occupied in fiscal year 1971. A Fuel Conservation Coordinator was designated in January 1971 to insure, among other things, that DOT energy conservation programs were implemented. In May 1971 a Fuel Conservation Program was developed.

In December 1973, an Energy Conservation Coordinator was designated to coordinate all energy reduction activities at TSC and ensure that the President's mandated reduction goals were met.

Specific actions taken by TSC management to make employees aware of the need for energy conservation have included:

- issuing directives for equipment operation to reduce energy,
- placing posters, announcements, and bulletins concerning energy conservation throughout the buildings,
- establishing a car pool program,
- encouraging employees to use mass transportation, and
- printing articles on energy conservation in the TSC newsletter.

MEASURES TAKEN TO REDUCE  
ENERGY USE IN BUILDINGS

As discussed earlier, TSC has made a considerable reduction in the use of both electricity and steam. This was done by:

- developing a system which uses heat generated in computer areas to pre-heat the air used to heat office areas,
- shutting down selected hot and chilled water circulating pumps at night and on weekends,
- raising the temperature of the chilled water used for cooling and lowering the temperature of the hot water used for heating,
- installing regulators on the steam absorption chiller to reduce the initial start-up consumption of steam,
- shutting down the heating and cooling unit for the Auditorium when it is not used,
- setting thermostats at 68° during the heating season and at 76° to 80° during the cooling season, and
- removing selected light fixtures.

TSC personnel monitor energy use by reviewing steam consumption charts weekly for unusual peaks which may indicate leaks or improper operation. In addition, monthly steam and electric bills are compared with prior periods as well as weather conditions.

MEASURES TAKEN TO REDUCE  
ENERGY USED BY VEHICLES

Measures taken to reduce vehicle use included:

- using TSC operated vehicles on a pooled basis,
- establishing expenditure limitations for the use of rented vehicles,
- using public transportation instead of motor pool vehicles for trips to downtown Boston,
- prohibiting the use of motor pool vehicles to pick-up small purchases in cases where the supplier performs delivery service,
- establishing tune-up schedules for TSC vehicles,
- putting energy conservation decals inside and outside TSC vehicles, and
- changing the outside security operation from a riding to a foot patrol on nights and weekends.

Employees have been encouraged to reduce their use of motor vehicles through a computer matching car pool program. Facilities have also been provided for motorcycles and bicycles. In addition, TSC has arranged for its employees to participate in a program offered by the Massachusetts Bay Transportation Authority. Under this program, employees purchase, through payroll deductions, a pass which allows them to use the public transportation system at any time. Since the annual cost of the pass is based on 210 round trips (42 work weeks), employees can save money by using public transportation.

IMPACT OF ENERGY CONSERVATION  
ON TSC'S MISSION

TSC officials told us that their energy conservation measures have had no impact upon TSC's ability to perform its mission.

CONCLUSIONS AND RECOMMENDATIONS

TSC's implementation of the Government's energy reduction program has been very effective. Through various measures, TSC has been able to considerably exceed the Presidential energy reduction goals without adversely affecting its operations.

The system used by TSC to gather data on energy use is generally adequate. However, for reporting purposes, TSC converts pounds of steam purchased to gallons of fuel oil used. In our opinion, this is unnecessary and could be misleading since TSC does not use fuel oil to generate steam.

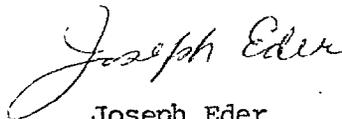
With respect to vehicles, TSC has not prepared monthly summaries of the mileage traveled in personal or rented vehicles although these vehicles generally account for more than one-half of the miles traveled in a quarter. We believe such summaries would be beneficial and would help TSC in identifying areas for potential reduction.

Accordingly, we recommend that TSC:

- report the pounds of steam used instead of converting to gallons of fuel oil in its quarterly reports to DOT headquarters, and
- prepare monthly summaries of the miles traveled in personal and rented vehicles.

I would like to express my appreciation for the cooperation given my staff during this review.

Sincerely yours,



Joseph Eder  
Regional Manager

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