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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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LOGISTICS AND COMMUNICATIONS DIVISION

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The Honorable Arthur F. Sampson
Administrator of General Services
General Services Administration
Washington, D. C.

Dear Mr. Sampson:

In the Spring of 1973, the General Accounting Office initiated a survey of the potential for energy conservation in Federal office buildings in California. As a result of the survey, a review was begun on June 11 in General Services Administration (GSA) Regions 1, 3, 4, and 9. Because energy conservation is a growing National concern, we wanted to determine how effectively certain Federal directives were being carried out, and assess the potential for further energy conservation in Federal office buildings.

On June 29, 1973, the President directed that all departments and agencies review activities which place demands on energy resources and determine how demand should be reduced. He established a goal for the Federal Government of reduction of expected demand for energy by 7 percent over the next year. In order to reach this goal, your office has issued an order which would strengthen the Government-wide energy conservation program by requiring specific changes in operating practices in the 10,000 GSA managed buildings.

Because of the action you are taking, we are deferring our review for the present time. We believe, however, that our initial observations resulting from visits to eight GSA-owned or operated buildings may be of interest to you, as they support the need for renewed emphasis on energy conservation practices.

Our observations relate to the major energy consuming operations in centrally air conditioned buildings, namely illumination, air handling, cooling, and heating. We noted instances where utility costs per net square foot varied by more than a factor of two for buildings in the same building class and in the same climate zone. While tenant

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requirements for such things as 24-hour operation and computer equipment could explain some of the higher costs, we believe that variances of this magnitude are more likely due to ineffective building operations. For example:

-- Building managers were not always adhering to GSA guidelines for energy conservation or recommended equipment operating procedures. Equipment operating records were at times found to be incomplete and inaccurate.

-- Equipment control instrumentation in some buildings was inaccurate and had not been calibrated for several years.

-- One of the conservation methods GSA has advocated in its "Conservation of Utilities" program calls for proper boiler control by observing stack temperatures and carbon dioxide content. Some operators, however, were unaware of what these measurements meant, and did not have instruments to observe these parameters.

-- Some buildings were found to be operating on a 24-hour basis even though less than 5 percent of the building occupants were present during night time hours. Except for security and custodial tasks, night time operations were usually restricted to specific building areas, yet entire buildings or large building segments were found to be fully illuminated and ventilated and in some cases air conditioned.

-- In several buildings, boilers were producing steam or hot water for building heating coils in periods of unusually hot weather. Likewise, in at least one building, chillers were left on in the winter even though outside temperatures were near freezing.

-- Fresh air intake in some buildings was limited to 20 to 30 percent, and intake and return air louvers were often frozen in position. According to GSA guidelines, the use of outside air for cooling is a valuable technique in reducing costs. This is especially true for buildings with interior zones that are prone to being overheated during the winter months.

-- Most GSA buildings process supply air by chilling a mixture of return and fresh air to chill the air and control humidity levels. The chilled air is then reheated to room inlet

temperature by the use of steam or hot water coils. Substantial savings in building energy consumption are possible if the reheat process is accomplished by using heat contained in the return air rather than using boiler heat.

-- Ventilation fan operation constitutes up to 50 percent of a building's electricity use. Nevertheless, while GSA building operating guidelines restrict the use of air conditioning and heating equipment to normal operating hours, they do not specifically restrict operation of the ventilation system. In some buildings where air chillers are being shut down at night, on weekends, and on holidays, the ventilation system often continues to operate. Ventilation continues even under favorable weather conditions and when the building or particular building zones are completely unoccupied.

-- Average supply air temperatures at the entrance to general office areas in several buildings ranged from about 64 to 70 degrees Fahrenheit. Cold duct temperatures ranged from 52 to 59 degrees Fahrenheit. Adequate comfort levels can be achieved with cold duct temperatures of about 62 degrees which would result in substantial savings in chiller energy use.

-- Many buildings had uniform illumination systems with associated light levels often in excess of 100 foot candles. (GSA's current specification for new construction provides for an average of 70 foot candles.) At least one building area was found to be uniformly illuminated in excess of 200 foot candles. Illumination in lobbies, hallways, restrooms, and other public building areas were also found to be excessive.

The conclusion reached, as a result of our survey and limited review, is that substantial improvement can be made in implementing energy conservation practices.

We therefore concur in your action to improve the Government's energy conservation program as it relates to GSA operated buildings, and would like to be kept informed of your progress toward this goal.

Copies of this report are being sent to the House and Senate Committees on Appropriations, the House and Senate Committees on Government Operations and the House and Senate Committees on Public Works.

If you have any questions or would like to discuss our observations in greater detail, we would be happy to meet with you or members of your staff.

Sincerely,

R. S. Rothwell

for Fred J. Shafer
Director