

Drawing the hotline

During its first week of operation, the Department of Energy's hotline received more than 800 calls a day concerning its emergency building temperature restrictions program. And the callers were not mere tattlers. Ninety-five percent of them were confused building owners, managers and tenants asking how to comply with the 78°F summer cooling limit and the 65°F winter heating limit. Program coordinator Henry G. Bartholomew admits "there is some misunderstanding ... that the key [to compliance] is the thermostat setting." But "the fact is that actual temperature readings may be used to comply." Bartholomew explained that if three rooms are controlled by one thermostat, the temperature of any one of the three rooms can be taken to determine whether the owner is in compliance.

The temperature should be taken with an ordinary "dry-bulb" thermometer, Bartholomew says. However, when cooling a room, humidity becomes a factor. A room may be kept cooler than 78°F so that it can reach a "dew-point" temperature no lower than 65°F. The dew-point temperature is a measure of humidity.

DOE has described the techniques for measuring indoor temperatures in a newly released 16-page manual "How to Comply with the Emergency Building Temperature Restrictions." More than 4 million copies have been mailed to building owners and operators.

A copy of the manual or further information may be obtained by calling the hotline at (800) 424-9122.

To fix the flux

Urban areas such as San Francisco may be getting 30 percent less sunlight than currently estimated, which may affect the financial estimates of solar power, claims Terry R. Galloway of the Lawrence Livermore Laboratory in Livermore, Calif. Researchers, Galloway says, have overlooked the over-all effects of man-made pollution in their predictions of "solar flux" — the flow of sunlight through the atmosphere. New methods should evaluate the scattering of light by water droplets and by natural and man-made aerosols, Galloway says. Sunlight is absorbed in the atmosphere by water, oxygen, ozone, methane, carbon dioxide and nitrogen oxides. Older calculations considered only dust as air pollution, he says.

Galloway has established his own correlation between solar flux and air pollution. Using a 20-inch refractor telescope on loan from the Oakland public school system, he measured a wide range of air pollution conditions after sunset, by sighting lights across the San Francisco Bay and stars in the sky. The pollution included oxidants, nitrogen oxides, particulates, humidity and precipitation. He also considered the effects of geography and of altitude. He classified geographical sites as continental, maritime or urban. Continental areas (notably West Texas, Chile and Hawaii) are dusty. Early measurements of solar flux in those areas are accurate "if not a bit conservative," Galloway says. "Maritime sites are characterized by on-shore ocean breezes which carry marine aerosols but no natural dust," and solar flux there is 10 to 15 percent of previous estimates, he found. But in urban areas (such as San Francisco, Los Angeles and New York) with their attendant air pollution and moist air, 30 percent less sunlight may be retrievable by solar collectors than previously thought, he says. "The effect [of pollution] is negligible during the winter since the height of the particulates is only about 900 feet; thus the dominant problem arises in summer, when the particulates are carried to high altitudes," he says.

But Galloway is careful to add: "We haven't said that solar opportunities have dimmed considerably. We only think [solar flux measurements] should be made more accurately."

AUGUST 25, 1979

Continental crust research needed

Though the United States has had a major program in ocean drilling — the Deep Sea Drilling Project — since 1968, scientific drilling of the continental crust has been sporadic, uncoordinated and unfocused. But it's time to change that, according to a recent report of the U.S. Geodynamics Committee of the National Academy of Sciences. The concept of plate tectonics and "the realization that although the continental crust is complex, it is not impossibly so," provide the rationale for a Continental Scientific Drilling Program, according to the report — a summary of a workshop held last summer in Los Alamos, N.M.

The committee, chaired by John C. Maxwell of the University of Texas in Austin, is developing a research program for the 1980s that includes increased emphasis on the continental crust. "At present, there is better understanding of the oceans than of the continent. ... Now the challenge is on land," the report says. Federal agencies currently are spending more than \$500 million a year on continental drilling projects, the committee says; often, expensive holes are drilled for a single purpose or several agencies carry out similar projects independently. Were those fragmented efforts united into a single program, that huge investment would see a maximum scientific return, they say.

A coordinated program would emphasize four general areas:

- Basement structures and deep continental basins — to study both broad and specific questions about the structure of the continental crust.

- Thermal regimes — to produce "three-dimensional understanding" of geothermal energy sources.

- Mineral resources — to gain basic understanding of ore formation.

- Earthquakes — to understand faulting mechanisms, which in turn will aid siting for nuclear waste isolation, nuclear power plants and dams.

Organizationally, the Continental Scientific Drilling Program would include two committees, the report says. A Scientific Drilling Advisory Committee would establish scientific priorities and objectives and a National Drilling Operations Committee would handle information and data exchange.

USGS scores on oil and gas estimates

Estimating the oil and gas potential of an undrilled site is, financially at least, a high risk game. But the U.S. Geological Survey seems pretty good at it, according to an article in the Aug. 3 *SCIENCE*. There is a "moderate positive correlation" between the USGS pre-drilling estimates of wells on the outer continental shelf and the post-drilling volumes discovered, say Myron F. Uman of the National Academy of Sciences and William R. James and Holly R. Tomlinson, both of the USGS in Reston, Va.

Before the Bureau of Land Management sells a tract of the federal outer continental shelf for commercial drilling, the USGS evaluates the resource potential of the tract to be sure that the government gets a fair market value. They don't have much to go on; the only data available for such estimates are seismic records and the logs and production histories from wells on already leased lands near the tract in question. Not until several years later can the geologists' skill be verified by comparing the pre-sale evaluations with proven reserves — estimates based on the resources actually found. Since 1968, the USGS has made presale evaluations of each tract to be sold; proven reserves have been estimated for 108 of those tracts. In all but two instances, the researchers found, there is a "highly significant positive correlation" between the pre-sale and post-drilling estimates. The two inconsistencies occurred during a period of transition from a familiar method of evaluation to a new, unfamiliar method, they say.

143