

# DOE-2 USER NEWS

: A COMPUTER PROGRAM FOR BUILDING ENERGY USE ANALYSIS

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### Table of Contents

Seeing Daylight in Southern California	1
Cross-Index by Abbreviation — LOADS	2
One Lone Bug	6

## BULLETIN BOARD

**Item:** The DOE-2.1C version of the program is now available. Please call or write to us at LBL for details on obtaining the new program. The *Documentation Update Package* is also now available from the National Technical Information Service. See the tear-out NTIS Order Form on page 7. Because there was to be a price increase on all NTIS publications, after this newsletter went to press, no prices are given. Call NTIS for the latest information.

## SEEING DAYLIGHT IN SOUTHERN CALIFORNIA

A program to encourage the use of daylighting technology has been developed by one of the nation's largest investor-owned electric utilities, Southern California Edison Company. Their "Daylighting and Thermal Analysis Program", now in its second year, is a multifaceted effort to increase the use of daylighting in the design of commercial and industrial buildings. In addition to providing economic incentives to architects and their clients, Edison has recognized the need to increase awareness and knowledge of daylighting design techniques among architects and other design professionals.

Daylighting is just beginning to appear in the curricula of design schools, and until recently, experienced professionals have lacked daylighting methodologies which incorporated electric lighting savings along with illuminance level calculations.

One of Edison's main goals, therefore, has been to develop and disseminate the calculational procedures needed to identify daylighting's effects on electric lighting systems. Additionally, they have compiled well-documented examples of effectively daylit buildings and accompanying data on energy savings. They have focused on office buildings, schools, retail outlets, grocery stores, and warehouses because these types are all characterized by daytime use patterns, long hours of lighting use, relatively high lighting levels, and high installed  $W/ft^2$ . A comprehensive design manual for daylighting has been developed to help give decision-makers the information to make cost-effective recommendations.

In order to get this material into the right hands—those of architects, engineers, developers, and contractors, Edison is conducting daylighting workshops in conjunction with local chapters of the American Institute of Architects. The utility also keeps an ear to the ground of construction activity (in the form of a subscription service which reports size, location, and project developer of construction sites). Their Energy Service Representatives make contact with developers and design firms. In appropriate applications, Edison offers design assistance, computer energy analysis, as well as a package of financial incentives — payment of half the cost (up to \$25,000) for daylighting feasibility studies, and a 4¢ payment for each kWh estimated to be saved in the first year as a result of the building's daylighting features as compared with a conventionally designed structure.

In one case, a 100,000  $ft^2$  office complex, now under construction, a computer analysis estimated that daylighting would result in a reduction of more than 50% of its electric lighting requirements. The building owner will also receive approximately \$20,000 in "rebates" for incorporating daylighting in the building design.

Through an aggressive campaign to research and encourage daylighting strategies, and by using computer programs, typically DOE-2.1B, Quicklite Plus, Skylite, Microlight, and Daylite, Edison has energetically taken a lead in the reduction of energy consumption in Southern California. Other utilities are watching closely the progress being made here.

Further information can be obtained from Gregg D. Ander, Director, Daylighting and Thermal Analysis Programs, Southern California Edison Company, Rosemead, CA, (818) 302-1957.

## LOADS

Abbreviation	Command/Keyword
W-H	WS-HEIGHT
W-P	WALL-PARAMETERS
W-S	WIND-SPEED
W-S-T	WIN-SHADE-TYPE
W-SCH	WEEK-SCHEDULE
W-T-P1	WS-TERRAIN-PAR1
W-T-P2	WS-TERRAIN-PAR2
WI	WINDOW
Z-F1	ZONE-FRACTION1
Z-F2	ZONE-FRACTION2
Z-TYPE	ZONE-TYPE

\*\*\*\*\*

## ONE LONE BUG

Ten DOE-2.1C bugs were reported in the Summer issue of the newsletter. If your installation did not receive written modifications from this office to fix the ten bugs, you should write or call us to obtain them. Those bugs existed *only* in versions of the tape sent out prior to July 1, 1985. Since then, only one new bug has been discovered. It exists in all tapes sent out prior to September 11, 1985. The fix is provided below.

- 11) In Report LS-L, the Management and Solar Summary, the quantities for "AVERAGE DAILY SOLAR RADIATION INTO SPACE" and "MAXIMUM HOURLY SOLAR RADIATION INTO SPACE" are not those for solar gains (unweighted) as intended. Rather, the values are currently those for solar loads (weighted). This problem was also present in DOE-2.1B.

The following modification to LOADS will fix this bug.

```
*D DAYCLC 375,379
  ZLSL(1,2,IZONE)=ZLSL(1,2,IZONE)+ <QSOL1>
  ZLSL(2,2,IZONE)=ZLSL(2,2,IZONE)+ <QSOL1>
C    MAXIMUM SOLAR
  IF (<QSOL1> GT ZLSL(1,3,IZONE))ZLSL(1,3,IZONE)= <QSOL1>
  IF (<QSOL1> GT ZLSL(2,3,IZONE))ZLSL(2,3,IZONE)= <QSOL1>
```

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## APOLOGY

You will have noticed that the last two issues of this newsletter, Spring and Summer 1985, were delivered to you together in August. Somewhere between California and Virginia, the shipment containing the Spring issue was lost and efforts to locate it failed. By the time we had reprinted it, the Summer issue was already due — so you unfortunately received them simultaneously. We are sorry for the delay.



## CROSS INDEX BY DOE-2 ABBREVIATION

This index to the LOADS portion of the program applies to the DOE-2.1C version. For brevity's sake, commands and keywords which do not have abbreviations do not appear in the list. We are publishing the index in installments — SYSTEMS will appear in the Winter issue. If you are in immediate need of the full index, write or call us and we will mail a copy out to you.

## LOADS

<i>Abbreviation</i>	<i>Command/Keyword</i>
A	AREA
A-A	AXIS-ASSIGN
A-C	AIR-CHANGES/HR
A-F-C-DT	AIR-FLOW-CTRL-DT
A-F-R	AIR-FLOW-RATE
A-F-T	AIR-FLOW-TYPE
A-MAX	AXIS-MAX
A-MIN	AXIS-MIN
A-T	AXIS-TITLES
ABS	ABSORPTANCE
ALT	ALTITUDE
ATM-M	ATM-MOISTURE
ATM-T	ATM-TURBIDITY
AZ	AZIMUTH
B-L	BUILDING-LOCATION
B-R	BUILDING-RESOURCE
B-S	BUILDING-SHADE
C-A	CLOUD-AMOUNT
C-N	CLEARNESS-NUMBER
C-P-P	COOL-PEAK-PERIOD
C-SCH	CONDUCT-SCHEDULE
C-T	CLOUD-TYPE
C-T-SCH	CONDUCT-TMIN-SCH
C-W	CHANNEL-WIDTH
CL	CLEARNESS
COND	CONDUCTIVITY
CONS	CONSTRUCTION
D	DEPTH
D-D	DESIGN-DAY
D-H	DOORWAY-H
D-R-SCH	DAYLIGHT-REP-SCH
D-S	DAYLIGHT-SAVINGS
D-SCH	DAY-SCHEDULE
D-W	DOORWAY-W
DAY	DAYLIGHTING
DB-H	DRYBULB-HI
DB-L	DRYBULB-LO
DEFINE	PARAMETER
DENS	DENSITY
DH-H	DHOUR-HI
DH-L	DHOUR-LO
DP-H	DEWPT-HI
DP-L	DEWPT-LO

## LOADS

Abbreviation	Command/Keyword
E-KW (under BUILDING-RESOURCE)	ELEC-KW
E-KW (under SPACE-CONDITIONS)	EQUIPMENT-KW
E-L	EQUIP-LATENT
E-S	EQUIP-SENSIBLE
E-SCH (under BUILDING-RESOURCE)	ELEC-SCHEDULE
E-SCH (under SPACE-CONDITIONS)	EQUIP-SCHEDULE
E-W (under SPACE-CONDITIONS)	EQUIPMENT-W/SQFT
E-W (EXTERIOR-WALL command)	EXTERIOR-WALL
EM	EMISSIVITY
F-F	FURN-FRACTION
F-KW	FAN-KW
F-L-A	FRAC-LEAK-AREA
F-M	FLOOR-MULTIPLIER
F-S	FIXED-SHADE
F-TYPE	FURNITURE-TYPE
F-W	FLOOR-WEIGHT
F-WGT	FURN-WEIGHT
G-A	GROSS-AREA
G-C	GLASS-CONDUCTANCE
G-C-P	GLARE-CTRL-PROB
G-F-F	GND-FORM-FACTOR
G-R	GND-REFLECTANCE
G-SCH	GAS-SCHEDULE
G-T (under BUILDING-RESOURCE)	GAS-THERMS
G-T (GLASS-TYPE command)	GLASS-TYPE
G-T (under DESIGN-DAY)	GROUND-T
G-T-C	GLASS-TYPE-CODE
H	HEIGHT
H-H	HOURLY-HI
H-L	HOURLY-LO
H-L-F	HOR-LEAK-FRAC
H-P-P	HEAT-PEAK-PERIOD
H-R	HOURLY-REPORT
H-W	HOT-WATER
HOL	HOLIDAY
HW-SCH	HW-SCHEDULE
I-C	INF-COEF
I-CFM	INF-CFM/SQFT
I-E	INSIDE-EMISS
I-F-R	INSIDE-FILM-RES
I-M	INF-METHOD
I-S-A	INSIDE-SOL-ABS
I-SCH	INF-SCHEDULE
I-V-R	INSIDE-VIS-REFL
I-W	INTERIOR-WALL
I-W-TYPE	INT-WALL-TYPE
L-C-P	LIGHT-CTRL-PROB
L-C-S	LIGHT-CTRL-STEPS
L-C-T1	LIGHT-CTRL-TYPE1
L-C-T2	LIGHT-CTRL-TYPE2
L-F-A	LEFT-FIN-A
L-F-B	LEFT-FIN-B
L-F-D	LEFT-FIN-D

## LOADS

Abbreviation	Command/Keyword
L-F-H	LEFT-FIN-H
L-H-T	LIGHT-HEAT-TO
L-KW	LIGHTING-KW
L-R	LOADS-REPORT
L-R-F	LIGHT-RAD-FRAC
L-R-P1	LIGHT-REF-POINT1
L-R-P2	LIGHT-REF-POINT2
L-S-P1	LIGHT-SET-POINT1
L-S-P2	LIGHT-SET-POINT2
L-SCH	LIGHTING-SCHEDULE
L-T	LIGHTING-TYPE
L-T-O	LIGHT-TO-OTHER
L-T-R	LIGHT-TO-RETURN
L-T-S	LIGHT-TO-SPACE
L-V-A	LOWER-VENT-AREA
L-W	LIGHTING-W/SQFT
LA	LAYERS
LAT	LATITUDE
LIST	DIAGNOSTIC
LOC	LOCATION
LON	LONGITUDE
M	MULTIPLIER
M-G	MAX-GLARE
M-L-F	MIN-LIGHT-FRAC
M-P-F	MIN-POWER-FRAC
M-S-SCH	MAX-SOLAR-SCH
MAT	MATERIAL
N-L	NEUTRAL-LEVEL
N-O-P	NUMBER-OF-PEOPLE
N-T	NEXT-TO
N-Z-H	NEUTRAL-ZONE-HT
O	OPTION
O-S-SCH	OPEN-SHADE-SCH
OH-A	OVERHANG-A
OH-ANG	OVERHANG-ANGLE
OH-B	OVERHANG-B
OH-D	OVERHANG-D
OH-W	OVERHANG-W
P	PANES
P-H-G	PEOPLE-HEAT-GAIN
P-H-L	PEOPLE-HG-LAT
P-H-S	PEOPLE-HG-SENS
P-SCH	PEOPLE-SCHEDULE
R-B	REPORT-BLOCK
R-F	REPORT-FREQUENCY
R-F-A	RIGHT-FIN-A
R-F-B	RIGHT-FIN-B
R-F-D	RIGHT-FIN-D
R-F-H	RIGHT-FIN-H
R-I-C	RES-INF-COEFF
R-SCH	REPORT-SCHEDULE
RES	RESISTANCE
RO	ROUGHNESS

## LOADS

Abbreviation	Command/Keyword
S (SPACE command)	SPACE
S (under LOADS-REPORT)	SUMMARY
S-B	SOURCE-BTU/HR
S-C (under GLASS-TYPE)	SHADING-COEF
S-C (SPACE-CONDITIONS command)	SPACE-CONDITIONS
S-C-P	SUN-CTRL-PROB
S-COEF	SHIELDING-COEF
S-D	SHADING-DIVISION
S-F	SOLAR-FRACTION
S-F-F	SKY-FORM-FACTOR
S-G-R	SHADE-GND-REFL
S-H	SPECIFIC-HEAT
S-L	SOURCE-LATENT
S-S (under EXTERIOR-WALL & TROMBE-WALL)	SHADING-SURFACE
S-S (under SPACE-CONDITIONS)	SOURCE-SENSIBLE
S-SCH (under BUILDING-SHADE & FIXED-SHADE)	SHADE-SCHEDULE
S-SCH (under WINDOW)	SHADING-SCHEDULE
S-SCH (under SPACE-CONDITIONS)	SOURCE-SCHEDULE
S-T	SOURCE-TYPE
S-T-SCH	SOL-TRANS-SCH
S-V-R	SHADE-VIS-REFL
SCH	SCHEDULE
SET	SET-DEFAULT
SETB	SETBACK
SUNSP	SUNSPACE
T	TEMPERATURE
T-L-KW	TASK-LIGHTING-KW
T-L-SCH	TASK-LIGHT-SCH
T-L-W	TASK-LT-W/SQFT
T-P1	TERRAIN-PAR1
T-P2	TERRAIN-PAR2
T-W-NV	TROMBE-WALL-NV
T-W-V	TROMBE-WALL-V
T-Z	TIME-ZONE
TH	THICKNESS
TR	TRANSMITTANCE
U	U-VALUE
U-EFF	U-EFFECTIVE
U-F	UNDERGROUND-FLOOR
U-V-A	UPPER-VENT-AREA
U-W	UNDERGROUND-WALL
V (under LOADS-REPORT)	VERIFICATION
V (under SPACE)	VOLUME
V-AZ	VIEW-AZIMUTH
V-L	VARIABLE-LIST
V-T (under REPORT-BLOCK)	VARIABLE-TYPE
V-T (under GLASS-TYPE)	VIS-TRANS
V-T-KW	VERT-TRANS-KW
V-T-SCH (under BUILDING-RESOURCE)	VERT-TRANS-SCH
V-T-SCH (under WINDOW)	VIS-TRANS-SCH
V-V-S	VERT-VENT-SEP
W	WIDTH
W-D	WIND-DIR
W-F	WEIGHTING-FACTOR