



GE Lighting

Planning your lighting maintenance

Some establishments pay no attention to lights until a lamp goes out: then they will call the maintenance department. Next lamp goes out --call the maintenance department again! It is possible to go in indefinitely like this, replacing lamps only as they fail. It is called "spot relamping."

When lamps are relatively new there are few failures and spot relamping works fine. But as lamps age the failure rate increases (accelerating burn-out) taking its toll on the facilities department. No sooner have they put the ladder away from the previous call, the phone rings again, calling them to another part of the building to replace another failed lamp.

There is an intelligent way to manage costs associated with maintaining your lighting. Called "Planned Relamping," or "group relamping," this program calls for periodically replacing all the lamps in the facility with brand new lamps before the failure rate goes up dramatically. By avoiding this "accelerating burn-out" portion of the curve you minimize disruption and save

on labor and money. The maintenance crew can turn their attention from lighting to other worthwhile chores: servicing machinery, painting the air-conditioner ducts, etc..

When you analyze lighting costs you will find that the labor to replace lamps is generally higher than the cost of the lamps themselves. The per-lamp cost of replacing goes down dramatically from the "economies of scale" if relamping is done as a group. It is possible for a crew to come in on a weekend or evening and replace all the lamps in one session. This method minimizes disruption to patients and caregivers as the number of "spot visits" to replace lamps is drastically reduced: also, the new lamps will have fewer failures and the facility gets a brighter look and a face-lift.

In summary, replacing lamps on a planned schedule ensures (1) higher light levels and better overall system efficiency, (2) better color uniformity, (3) fewer inconveniences from burned out lamps and less disruption to patients, nurses and doctors and (4) more time for personnel to do productive things.



Spot Versus Group Relamping

There are a variety of reasons to practice group relamping, in which a set of lamps is replaced at a scheduled time, rather than spot relamping, in which lamps are only replaced when they burn out. Most of these reasons apply to fluorescent and high-intensity discharge (HID) lamps rather than incandescents, which have much shorter lifetimes and less lumen depreciation.

- Group relamping requires much less labor per lamp than spot relamping. A worker might take as long as a half hour to retrieve and install a single lamp. If all the materials were on hand for a large number of lamps, a worker could move systematically from fixture to fixture and cut the required time to about 3 minutes per lamp. The process would also be less disruptive since

group relamping is usually done outside working hours.

- Group relamping is easy to schedule and delegate to outside contractors, who have special equipment and training.
- Group relamping provides brighter and more uniform lighting because lamps are replaced before their output has fully

Table 1

Economics of group vs. spot relamping for 1,000 three-lamp T8 lensed troffers

Group relamping has higher lamp costs but much lower labor costs, in this case providing a 31 percent overall savings. Group relamping also provides additional benefits in lighting quality and easier facility management.

	Relamp cycle (hours)	Average relamps per year	Average material cost per year	Average labor cost per year	Total average cost per year
Spot relamping on burnout ^a	20,000	525	\$1,391	\$3,150	\$4,541
Group relamping at 70% of rated life ^b	14,000	750	\$1,988	\$1,125	\$3,113
Difference		225	\$597	-\$2,025	-\$1,428 31% savings

Notes:

a: Assumes labor costs of \$6.00/lamp for relamping and cleaning, material cost of \$2.65/lamp, and 3,500 hours/yr operation.

b: Assumes labor costs of \$1.50/lamp for relamping and cleaning, same material costs and operating hours as for spot relamping.

Source: EPA

depreciated. Direct energy benefits result if the designer, anticipating group relamping, uses a smaller safety factor.

- Group relamping offers increased control over the replacement lamps, reducing the chances of mixing incompatible lamps—such as those with different color temperatures.

Economic Comparisons

Economic comparisons typically show that group relamping has higher lamp costs but lower labor costs than spot relamping. One such comparison in the table below indicates a 31 percent overall savings from group relamping. This type of calculation is heavily depen-

dent on the difference in labor costs between group and spot relamping. For example, if the group relamping cost of \$1.50 per lamp jumps to \$3.50, the balance tips in favor of spot relamping. Remember, however, the noneconomic benefits of group relamping discussed above when deciding between the two methods.