

# A Lighting Conversion Case Study

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## TROPICANA - Florida Operations Bradenton, Florida

*"Tropicana is committed to changes which will improve the quality of the workspace and reduce environmental pollution. Lighting retrofit offered us an opportunity to do both — and to substantially reduce a fixed operating cost in the bargain."*

### DESCRIPTION:

The Florida facilities of Tropicana are located in Ft. Pierce and Bradenton. The Ft. Pierce facility is primarily a processing plant. The Bradenton complex is not only the largest processing plant in the state but is also a fully-integrated operation; manufacturing glass containers, pallets and cartons. Bradenton also houses Tropicana's corporate administration/engineering offices as well as numerous quality control, testing and USDA laboratories. There are a wide variety of fluorescent fixtures types and operating hours vary from 24 hours in plant areas to 12 hours per day in the administrative sections. Tropicana, in co-operation with Florida Power and Light, cogenerates electricity on site, resulting in exceptionally low power rates. Standard 40 watt cool whites and electromag-

netic ballasts were the norm for all areas addressed. A total of 2000 fixtures were designated for retrofit.

### GOALS:

Tropicana engineers were well aware of recent studies which linked increased employee productivity to an improved quality of light. They were also aware of the connection between reduced electrical consumption and reduced air pollution. Finally, they were aware of the positive impact on bottom-line profits caused by the significant reduction of a fixed cost — such as lighting. The retrofit goal was therefore to *maximize* each of the above conditions.

### CONSTRAINTS:

The major constraint was the financial justification, or cost-effectiveness, of such a large scale project. Tropicana, as a division of Seagram's, operates under strict criteria for rate of return on investments. Other constraints included: All components used were to be pre-approved by FPL for inclusion in their incentive/rebate program. All components used would feature factory warranties equal

to, or greater than, those they replaced. Harmonic distortion, created by electronic ballasts, had to be the equivalent or less than the ballasts they would replace. Measurable light levels were to meet or exceed IES and OSHA standards for the designated work areas.

### SOLUTIONS:

850 series T-8 lamps, which have maximum lumens per watt output and optimize visual acuity, were chosen, as were electronic ballasts with less than 17% harmonic distortion for the plant areas (Less than 8% for the critical data processing and employee services buildings). The 3 and 4 lamp fixtures were all delamped and reflectorized in order to maximize savings, yet maintain OSHA and IES intensity standards. Exit signs were converted from incandescent sources to LED's in order to maximize both power savings and maintenance savings.

### RESULTS:

Light levels and light quality were *increased* across the board. Tropicana's lighting system demand was lowered by 215,000 watts (215 kilowatts)...a 67% reduction. This, in turn, creates power

associated savings of \$40,000 annually and additional maintenance savings of \$18,500. Factoring in the FPL rebate, the payback for this project is less than 18 months.

Visual comfort in the workplace has increased substantially, as has visual acuity. Tropicana is currently documenting the impact of these factors on employee productivity and are predicting significant increase.

### EXPLANATION:

The nearly 70% decrease in electrical consumption was made possible by a careful application of a systems approach — maximizing potential savings by using all available lighting technologies as appropriate. Given the abnormally low cost of power for Tropicana, the surprisingly short payback period was a function of the high percentage of savings achieved as well as the relatively long hours of operation.

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