SINGAPORE TURF CLUB FLOODLIGHTING SYSTEM COST REDUCTION SOLUTION

Quality Power Management (QPM) and Singapore Turf Club (STC) introduces a newly implemented power management solution. This new power management solution focuses on system integration to reduce the cost of STC's power supply bills, and also maximizes the potential of existing power generators in STC's backup system that are currently under utilized.

The Floodlighting System

The web of floodlights that illuminate the racecourse grounds is fundamental to STC's operation. In all, there are approximately 2,500 track floodlight bulbs installed on the roof of the grandstand, camera towers and 42 high-masts around the racetrack for night racing. The existing track floodlighting system is powered by a number of 22kV / 400V substations (See Figure 1).

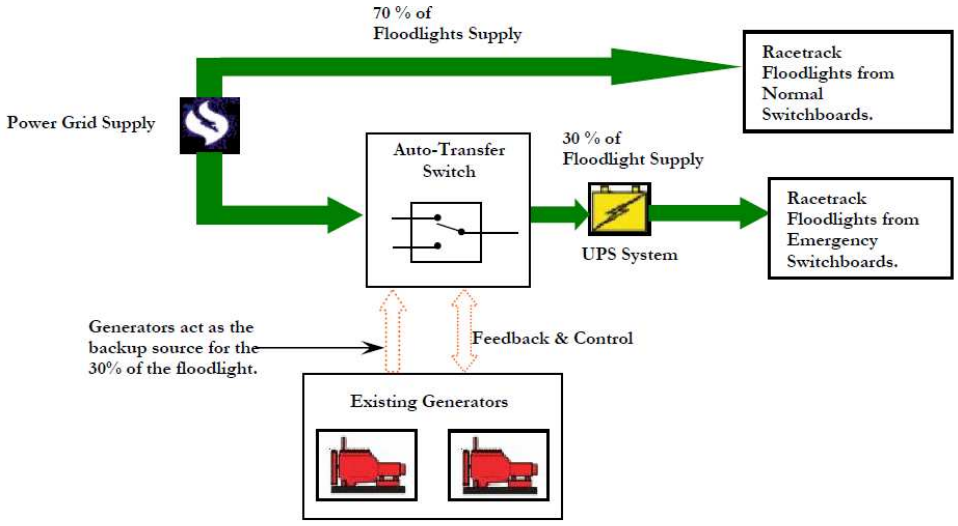


Figure 1: Existing System

70% of the track floodlighting system is connected to the normal switchboards, while the remaining 30% is connected to the emergency supply switchboards. The emergency supply switchboard is backed up by standby generators and Uninterruptible Power Supply (UPS).

In a normal power supply failure condition, the UPS will be able to support up to 30% of the track floodlighting system requirements for a short duration, during which the standby generators will auto-start and take over to supply the power needed. When generator mode is activated, the UPS batteries will be charged simultaneously.

Recommendation

With the assistance of STC, QPM analysed and proposed several possible alternatives to provide reliable power to the track floodlights, before deriving at a solution for the most economical means to power up the track floodlights.

QPM recommended the Peak Shaving technique. Instead of receiving electricity supply from PowerGrid with standby generator sets as a backup source, QPM suggested that STC reverse this operation by using its existing generator sets as the primary source.

Recommendation Rationale

By using existing generator sets as a primary source, STC will be able to save on its monthly contracted capacity charge, while concurrently receiving reliable supply from PowerGrid as a secondary source.

Failure Descriptions	Present	Proposed
Mains failure	30% lights sustain for 5mins by UPS. Generators take over supply immediately if started successfully.	30% lights which are powered by generators will not be affected.
UPS failure	Not noticeable if UPS goes to auto bypass.	Not noticeable if UPS goes to auto bypass.
Generators failure	Not noticeable.	30% lights sustained for 5mins by UPS. Mains take over supply immediately.
Mains & UPS failure	Total failure at the respective quadrant that the UPS failed.	30% lights which are powered by generators will not be affected.
Mains & Generators failure	Total failure at the respective quadrant if the generators failed to start after the UPS batteries are depleted.	Total failure at the respective quadrant if the generators failed after the UPS batteries are depleted.
Generators & UPS failure	Not noticeable.	Mains take over supply.
Mains, Generators & UPS failure	Total failure.	Total failure.

Table 1: Risk Comparison of failures between Present System and Proposed Modifications to the system

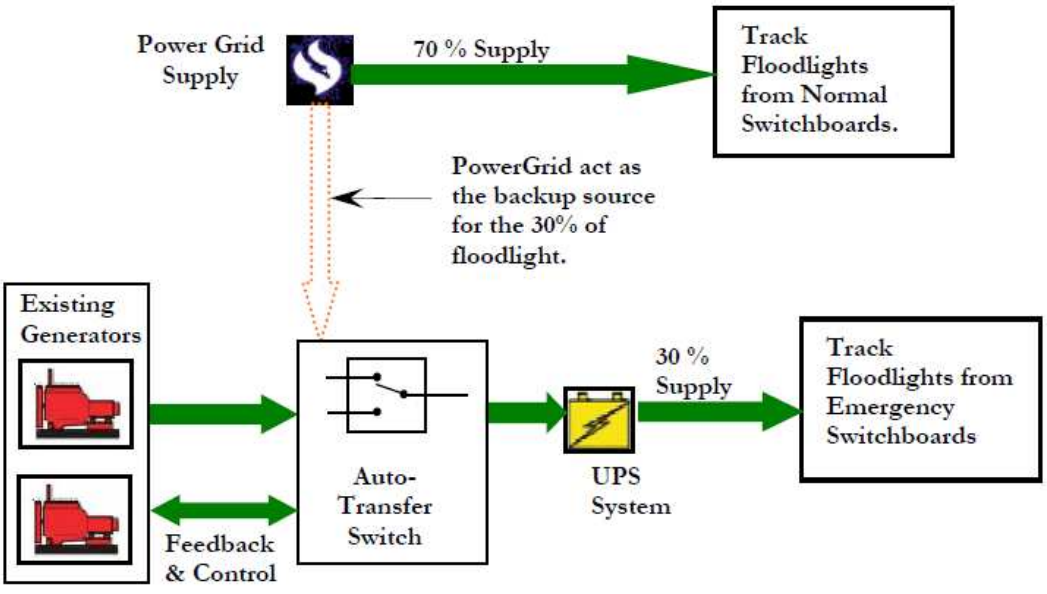


Figure 2: New Proposed System

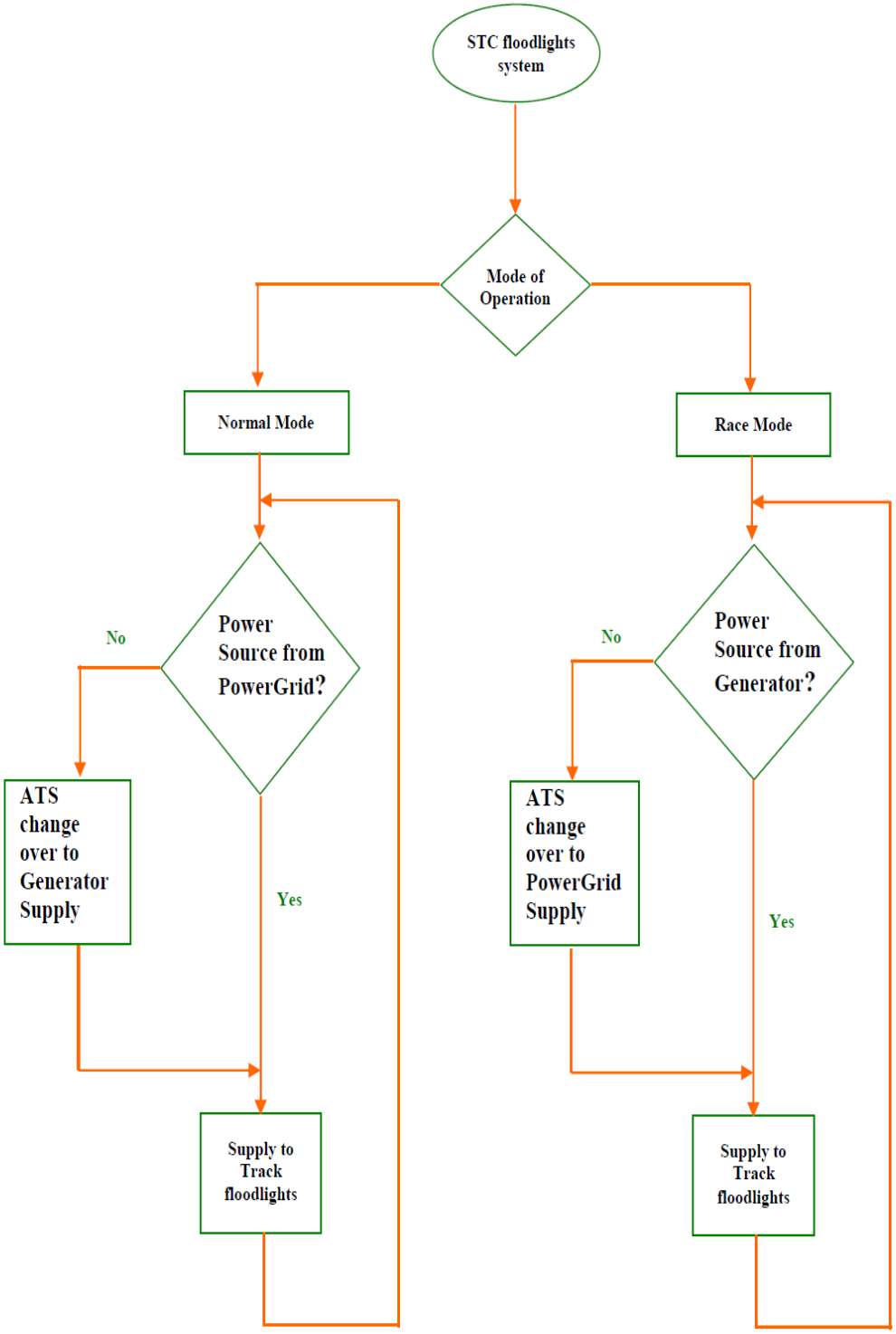
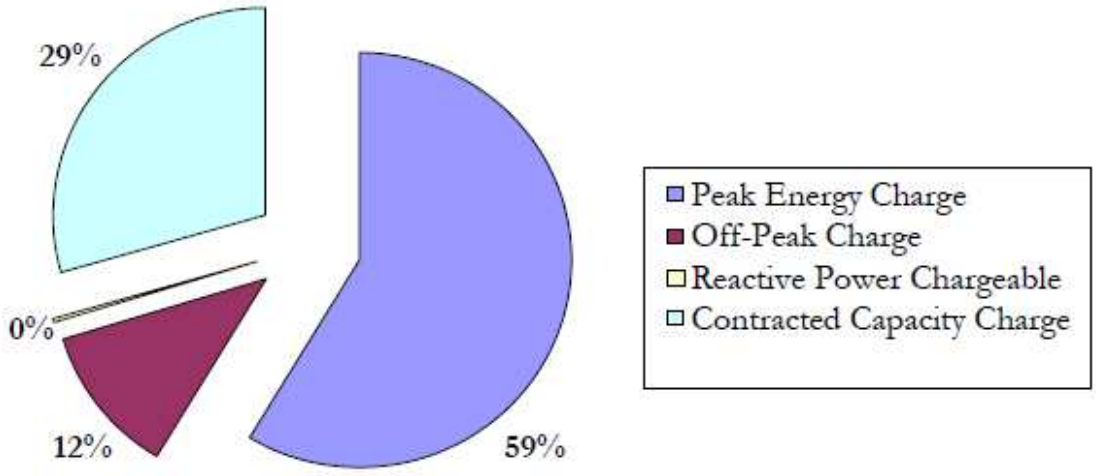


Figure 3: Flow Chart - Floodlights mode of operation

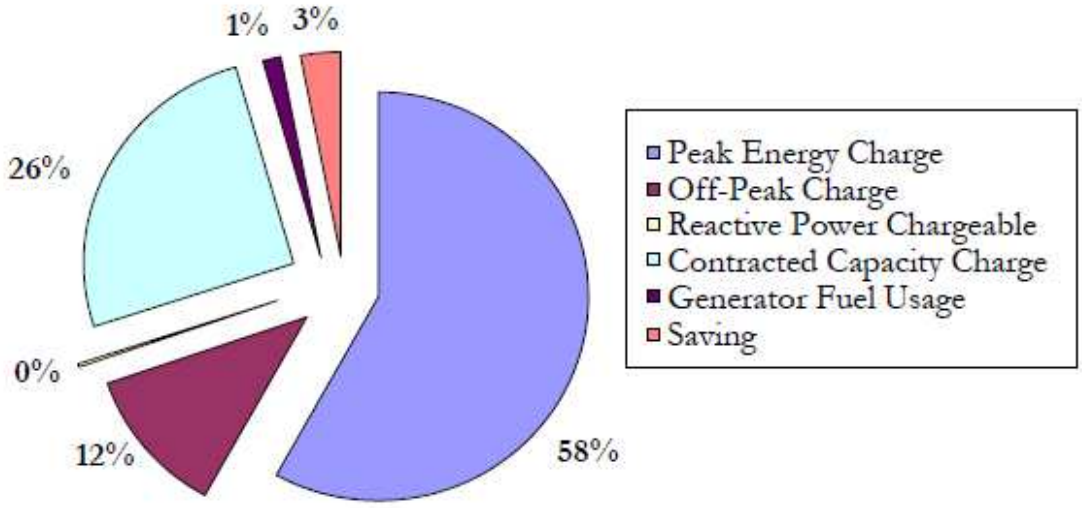
Business Benefits

The proposed new system will run on existing generators and UPS system, which involves little capital investment, except for the cost of modifying the operational function of the existing ATS as required. This investment cost is basically the labour cost and the material cost, which is about $1,000 per generator set. This covers the cost of both local and remote control by the Building Automation System (BAS).

Before Implementation



After Implementation



Conclusion

STC is confident of achieving the savings as stated based on all the cost saving data collated for the past one year on the designated generator. The engineering team is now looking into further savings by operating some of the air conditioning chillers on the generators during race days. By alternating the roles of STC's own generators and PowerGrid's supply, STC will be able to achieve even greater savings than the projected 3% from its monthly electric bills. This is accomplished by making use of under utilised investments that STC has already made in its backup generators. The cost of implementing this new system is negligible compared to the overall savings and effective use of its existing equipment.

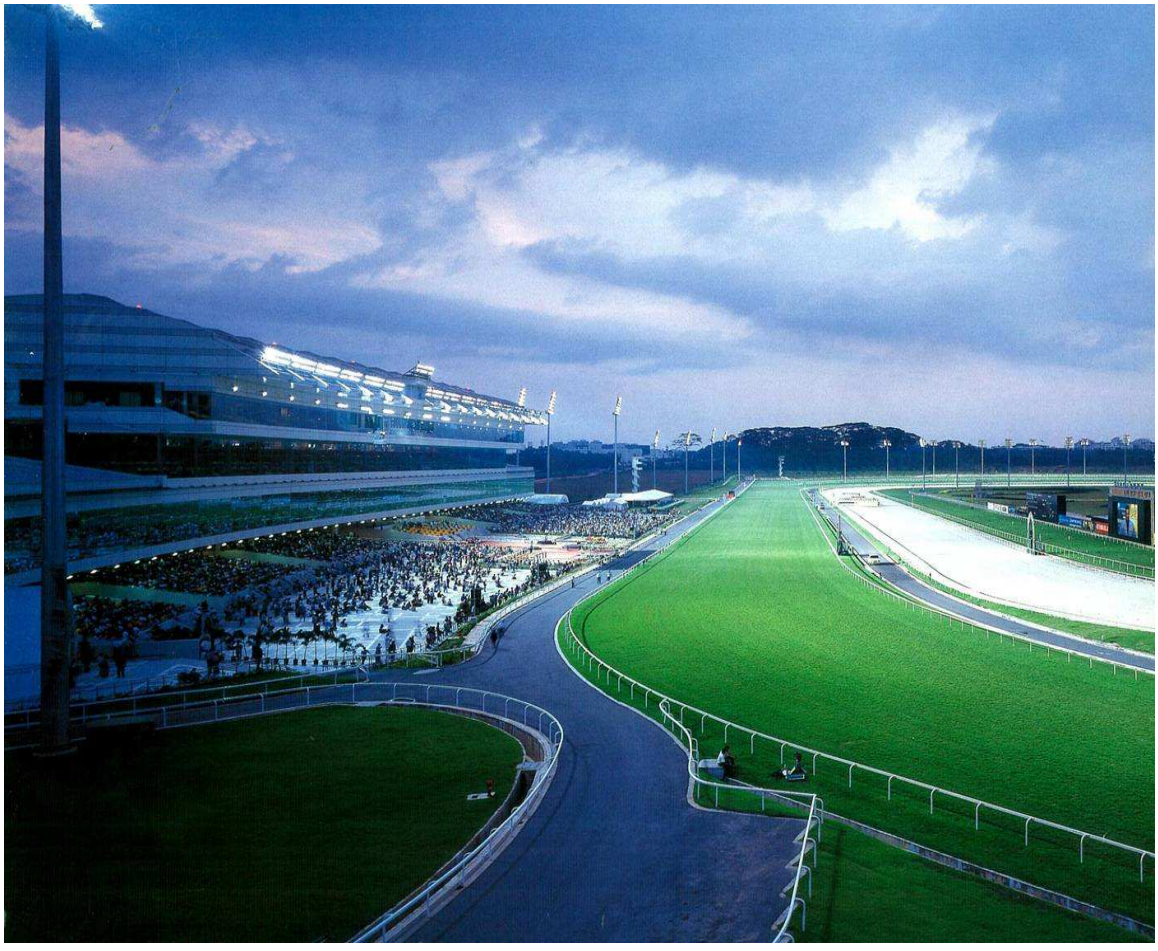
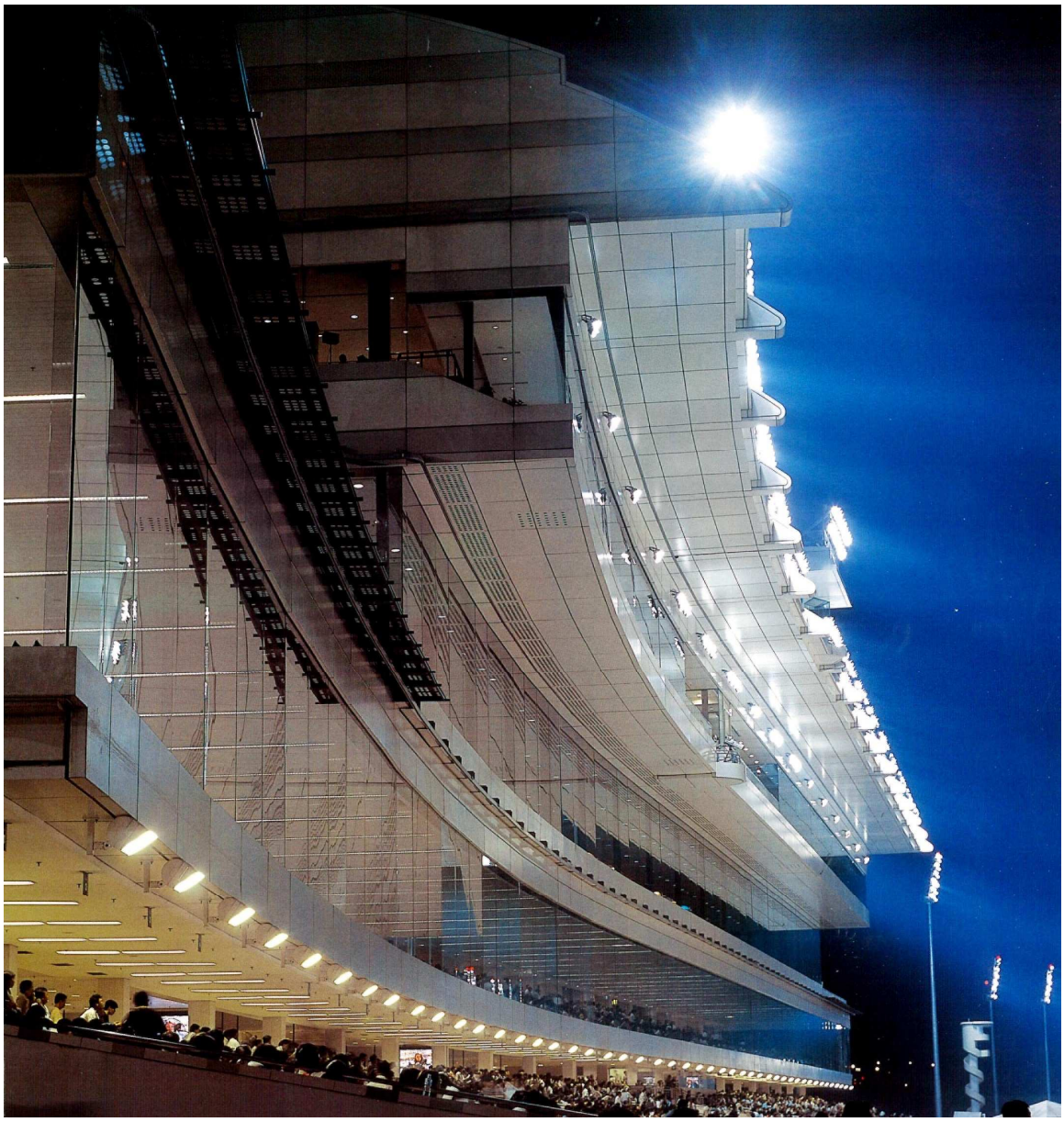


Photo of Singapore Turf Club



Another photo of the Singapore Turf Club