



Planning a Lighting System Upgrade

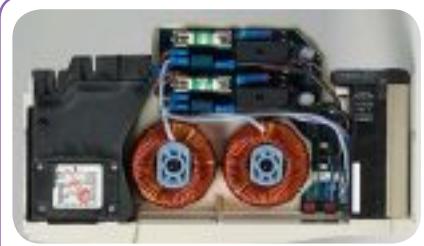
A goal-driven analysis of lighting needs is the foundation for an upgrade plan, as **John Black** illustrates

WHETHER DRIVEN BY AN AGING SYSTEM, a desire to become more energy efficient, or the need to expand to better support new and upcoming programmes in your facility, planning a lighting system upgrade can be a long and challenging process. To top it off, it often seems that the technology advances as quickly as your planning process! Such planning does not need to cause a lot of stress. This article will pose a number of questions to consider, and will hopefully help guide you, as you plan your upgrade.

What is your end goal?

When approaching any project, regardless of size, I like to reflect on and consider, 'What is my end goal?' Defining the end goal involves evaluating your current situation as well as where you want to be in the future: What programming do you currently support? Do your services currently include drama presentations or worship bands? How often does the stage setup change (weekly, monthly)? How often is your stage used and for what kinds of events from week to week? Do you employ a full-time technical staff or volunteer crew? Are the technical operators different every week? The answers to these questions have probably been a part of the decision to make a lighting system upgrade in the first place, but having a full understanding of current facility programming will guide you towards what direction to take.

What programming do you foresee needing to be able to support in the future? Is your organisation expanding and needing to upgrade to accommodate new needs? Are drama presentations going to become more common-place? Are you wanting to be able to host concert tours, or to begin renting



Devices like ETC's ThruPower constant power modules add flexibility to dimmed systems

out your facility to other groups? Are you planning to hire technical staff, or wanting to formalise a trained volunteer crew beyond what you currently have? I would encourage you to really think outside the box here. Spend some quality time thinking through every possibility of how you would like to be able to use your lighting system.

What are your limitations?

Once you've defined what your end goal is, you will need to consider what your limitations are. Now, your mind probably just went to the budget. Discussions

can be weighed down by the 'burden of the budget' and possibilities become impossibilities without further consideration. I encourage you to discuss end goals *without* considering the budget because it frees you up to discuss and discover real needs. Once you've defined your goals, then you are free to begin thinking of creative solutions to achieve those goals within the budget you have available.

Another limitation to consider is whether you are replacing the entire system, only upgrading certain parts, or expanding from what you currently have. What infrastructure do you currently have in place? Do you have dimmer racks with conventional lighting circuitry installed throughout your system that will be reused? Are you wanting to add data and power distribution to incorporate more automated lighting fixtures or energy-efficient LED fixtures? Are your current lighting positions in less-than-ideal locations and you want to move them to more ideal locations? Do you have a lighting console that is relatively new you'd like to continue using?

With regards to equipment and the work to be done during and after the upgrade, I also encourage you to consider external limitations not having to do with the facility itself. What production companies are

MEET THE AUTHOR

John Black serves as the theatre manager for Seoul Foreign School in Seoul, South Korea. Holding a degree in Theatre Design, he provides technical production support and design in three state-of-the-art performance venues on campus for over 40 major concerts and productions a year in the areas of sound, lighting, video and staging. John especially enjoys sharing his passion for entertainment technology with high school students each year through his student production team, *Crusader Live!*, giving students the opportunity to learn and work with professional-level technologies in a demanding production environment.



John Black, theatre manager for Seoul Foreign School

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available for you to work with and can they provide support service after the upgrade if need be? What appropriate products are available that also have easily available maintenance and repair service?

By combining your end goal with your limitations, you will have a roadmap to guide you in the specific decisions to be made regarding power distribution, data distribution, control and fixtures.

Power distribution

As the backbone of all lighting systems, the power distribution infrastructure is a key consideration for any upgrade. After all, the fixtures won't work if they don't have power! When considering power distribution for a lighting system, consider what you currently have installed as well as what is needed to achieve your end goals. Two important considerations are whether your current power supply and power distribution can meet your goals.

With regards to power supply, many facilities are equipped with lighting dimmers that run power to circuits distributed to lighting positions around the facility. Additionally, your facility may also have unassigned power capability close to the stage for temporary power runs. You will need to determine what types of equipment and future loads you will place on your power system when considering whether or not your supply is adequate for the programming in your facility. Thanks to ever advancing LED technology in lighting products, fixtures are becoming more power efficient, drawing less current than older fixtures. And while conventional lighting fixtures powered through dimming systems are still common, there are now potentially less expensive alternatives to installing traditional dimming systems and cabling infrastructure.

It is just as important to also consider your facility's power distribution. Where are your lighting circuits located? Are your lighting positions in locations that meet your lighting goals? Many manufacturers have developed dimmer modules that can help make a currently installed dimming system more flexible. I have ETC Sensor dimmers in all of my facilities, and I have upgraded to Sensor3 control modules and Sensor ThruPower modules over the years. This has allowed me to use my currently installed power distribution infrastructure to send non-dimmed, constant power to lighting positions where I can now power LED and automated fixtures, chain hoists,



Avolites' most specified lighting console, the Tiger Touch II



The view from the lighting console at Tarpon Springs, Florida's Grace Family Church East Lake, recently upgraded with help from Guitar Center Professional

and other gear requiring constant AC power. It was a simple, very cost-effective upgrade.

Data distribution

With LED and automated fixtures becoming common in even the smallest of facilities, the distribution of data is an important consideration in any lighting system upgrade. As I have upgraded my facilities, I have been sure to add a DMX data port at every lighting position, as well as several spread around the stage area so that I never need to run long data cables to fixtures for events. This allows for faster cabling when doing a hang, as well as increased safety. All of these data ports run to DMX splitters, which are connected to my lighting network. When considering data distribution upgrades, I encourage you to think through any and all locations you may want to be able to tap into your lighting network to control fixtures, and then plan to place a data port in those locations.

You may also need to consider the number of control universes you think you will use. Most automated fixtures utilise at least 20 addresses, so if your facility uses large rigs, you will need to take into account the number of universes to employ in your system and how they will be distributed around your facility. As an example, one of my theatres

permanently uses four universes of DMX, distributed by lighting position. Universe 1 serves conventional dimmers and LED/automated fixtures in FOH lighting positions. Universe 2 serves conventional dimmers and LED/automated fixtures in over-stage lighting positions. Universes 3 and 4 are distributed around the stage itself. I've come to appreciate knowing that if I have an issue with Fixture X with starting address 2/100, I automatically know that that fixture is in an over-stage position without needing to look at a plot.

You may also consider an entirely networked data distribution method, where data is distributed around your facility over Ethernet cables and devices speak to each other over a controlled network. This type of system gives you a lot of flexibility – for instance the ability to connect your control console wherever you have a lighting network port located. This may prove useful during focusing sessions or rehearsals for events.

Control console

In addition to considering the infrastructure of a system upgrade, you may also be considering the upgrade of your console. There are many brands of consoles on the market that all allow the operator to do the same thing – control lights! When considering a console upgrade, there are two major questions that I consider:

What do I need the console to be able to do? How many universes of control address do you need to control (or how many fixtures do you currently have in your rig or may you have in the future)? How many control channels need to be patchable? Do you need to have lots of faders for manually controlling fixtures, or do most of your events use pre-programmed lighting so having a small count of multi-use faders will serve you well? If your lighting rig consists of many automated or LED fixtures, you want to make sure you end up with a console that makes programming those fixtures easy and intuitive.

Who is going to be using the control console? If you frequently have volunteer turnover, you may be training people how to use the console often. Upgrading to a console that is too complicated for an infrequent user will frustrate both the user and yourself. Also, if you are going to be frequently changing the lighting programming, be sure that you are comfortable with working on the console and that its features work well for your workflow. Consoles' workflows are slightly different from brand to brand, so be sure to get a demo and find what console works best for you.

Fixtures

It's always tempting to want to get the newest fixture available or the one with the most features. Consider what you want to get out of the fixtures before quickly making an upgrade. For example, if you have identified that a goal is to be able to wash your stage with a different colour from week to week, you will probably want to look



A selection of 'basic' lighting fixtures combine to light a worship performance

at an LED wash fixture as opposed to conventional fixtures that would require you to replace and stock lighting gels. If your goal is to be able to program lighting movements in a rock-style service, you will want to look at an automated fixture. Or if your goal is to become more energy efficient, there are a number of LED-powered automated fixtures on the market now with light output that can stand up to some incandescent-powered fixtures.

When considering fixtures as part of an upgrade, ensure that you have the needed power and data distribution in your facility, a console able to effectively control the fixture, and a service provider for maintenance and repairs, prior to making a purchase.

Ultimately, the system you end up with should meet your current and future lighting needs, and if possible, have enough flexibility to allow for future expansion and to handle events you may not have yet thought of.

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