

To “enlighten” a performance venue

By **P.V. Joseph** of Combined Corporation, Singapore

This is a two part tutorial kindly contributed by P V Joseph of Combined Corporation in Singapore. P V Joseph has been involved with a number of lighting installations relating to performance venues. He has kindly consented to contribute this article which has been culled from his various installation experiences. This is indeed an enlightening (pardon the pun) article which we strongly recommend that readers pull out and keep for references and as a read for those who have just joined the industry.

The two part tutorial will cover the following contents:

- Summary**
- Introduction**
- The Client**
- Planning**
 - The Primary Purpose of the Venue
 - The Requirements of the Lighting Designer and Operator
 - Proposal of Additional New Equipment
 - The Seating Capacity of the Venue
 - The Size and Design of the Stage
- Design Phase**
 - Lighting Bar
 - Light Discipline
 - Main Curtain, Borders & Dress-legs
 - Layout of Electrical and Control Points
 - Lighting Fixture Selection
 - Profile
 - Spots, Washes and Floods
 - Intelligent Lighting
 - Lumen
- Safety**
 - Electrical Safety
 - Structural Safety
 - Operational Safety
- Architects, Consultants and Contractors**
 - Architects
 - Consultants
 - Contractors
 - Site Meetings
- Testing & Commissioning**
 - Electrical Testing
 - Testing of Dimmers
 - Lighting Fixture Testing
 - DMX and Lighting Console Testing
- Conclusion**
- Contact**
- Indemnity**
- Copyright**

Summary

Challenges faced in the consultation, planning & implementation of professional stage lighting system in a performance venue.

Introduction

To many who await to enter a performance venue, there is a feeling of expectation. An expectation to be brought into another world. The world where the gross and subtle details of the human expression and emotion is amplified and made public for all the world to learn, reflect and enjoy. Achieving such an expectation for the general public in a performance venue involves a lot of planning and design.

Lighting is a key player in the art of making an expression or an emotion clear to the audience. It also accentuates the mood and directs the attention of the audience to the scenes on stage. I have fallen in love with it, and feel that I have to contribute in some way to the lighting industry in Singapore. I have done this by briefly describing the issues involved in the proper lighting consultation, planning, design and implementation.

The Client

Before anything can even be discussed with regards to any project, we have to address the needs of the client. The Client to a large extent places a huge amount of trust, that what they are getting is an integrated system that works. The sad part is that the client is often left out of the picture once a project is awarded. The consultants and architects often take over immediately leaving the client high and dry.

There are instances where the client steps in and makes a stand when things get out of hand or not done as to client's expectation albeit this will be called a VO¹

This is due to the way things are done in Singapore. Since Project specifications have already been specified and sorted out by the architects and a few consultants prior to the actual construction work, (*The problems begin here at this stage*) Tenders are called for the Main Contractor and things begin almost immediately. Half way during the construction phase, problems crop up. (eg: A catwalk² is blocked by an air-conditioning ducting). Sometimes VOs cannot be

made due to design. The clients sometimes have no choice but to approve of such decisions which are contrary to the actual workings of a venue. The latter, will make it very clear for clients to be involved in every stage of the project.

Planning

In the Planning Phase, it is important to understand and consider the following :

- The Primary Purpose of the venue.
- The Requirements of the Lighting designer and operator.
- The Seating Capacity of the venue.
- The Size and Design of the Stage.

The Primary Purpose of the Venue

The primary purpose of the venue has to be decided and agreed by all parties in the client's working group or camp. Deciding the primary purpose of a venue is made complicated by the vagueness of the terms or names given to a performance venue. ie: The definitions of an "Auditorium" is actually a place where the audience sits in a venue. This venue could be a theatre or a concert hall whereas the "Stage" being a separate entity in the venue.

The "Auditorium" in Singapore's context is a venue where the stage and auditorium is combined and it is primarily used for seminars, which include the all important Power Point Presentations & Prize Giving Ceremonies. The term supposed to be used is Auditoria.

In Singapore, there are venues that are named with a post-fix Theatre, Halls, Centres, Auditoriums & Concerts when the facilities are not there to accommodate such a performance. This is partly due to the multi-functional role that venues here are made to comply.

Having a venue with too many roles increases the lack of speciality in the venues, since venue's have to cater to wide range productions, this lowers the standard of the productions and as a result the rental of venues has also suffers.

Sometimes there is no choice for a client but to employ this multi-functional role due to budget and space constraints. (eg: A combined performance arts & auditoria venue in a School). When deciding such a role for a venue it is important to limit the number of roles it should play (preferably two). When designing the venue 70% of design should be catered to its primary function and the balance 30% for its secondary function. (eg: Theatre 70% and Auditoria 30%).

A mistake in assigning wrongly the primary and the secondary purpose of a venue can happen. (eg: an auditoria cannot be a theatre but a theatre can be an auditoria)

Dedicated venues are a rarity here. Once the venue's purpose is decided, a clear draft of what the venue should accomplish should be written.

The Requirements of the Lighting Designer and Operator

The input from the Lighting Designer and the operator is very important as he/she has a very clear idea what the current venue is lacking in functionality. He/she can also highlight the problems associated with the current venue being proposed.

Operational problems could be the following:

- Blind spots that lighting cannot get to.
- Difficulty or unable to mount certain equipment,
- Difficulty in accessing and adjusting of lighting fixtures, motors and dimmers without the use of ladders (eg: Difficulty in accessing side/wing lighting fixtures in Schools).

Another point to look out for is whether Large Props can enter/exit the venue easily. This is done by catering sufficient number of ramps and large doors in the venue. A simple example would be moving the grand piano onto the stage from the lobby of the venue.

It is important that day to day operations and servicing should be easy and safe.

Proposal of Additional New Equipment

This is also a time to propose new equipment, and if possible propose new fittings that could cater for the new equipment in the future. (eg: Additional DMX 512³ points & Ethernet points for Moving Heads⁴, Scrollers⁵ and etc).

The Seating Capacity of the Venue

- Physically challenged people
- Line of sight
- Number of seats

The number and type of seating should be catered for the optimum viewing pleasure of the audience. Stuffing a venue with as many seats as possible will be at a disadvantage to the client and does a dis-service to audience, as this affects the Line of Sight⁶ and more importantly the safety of a venue. Special areas for the physically challenged persons to be seated and even participate properly in a venue should be considered.

The Size and Design of the Stage

An example of Stage design that has not changed, is the shallow depth with broad stage front in Singapore's Auditoria. This rather precarious stage design has been the long stay in Singapore.

One wonders whether such a stage design is to facilitate a long death march for the recipient at a prize giving ceremony for their retirement.

Designs have not changed and it is rather sad.

Design Phase

Lighting Bar

The location of the lighting bar in a venue has to be related to height of the stage, the angle of lighting to



the stage performer's eyes and the coverage expected to that particular stage area. This is to prevent a blinding glare to a performer if positioned wrongly. The position and location of the bar should cater to the type of fixture that is mounted. This is to allow easy access to the lighting operator for focusing and service. Freedom of movement for a lighting fixture without obstruction should also be catered in the design. The number, location and distribution of dimmer points available should also be planned accordingly.

Light Discipline

In most venues it is important to keep light discipline⁷. A theatre should be able to keep sections of the stage from light and remain in total darkness. This enhances the performance in creating startling effects in certain scenes and also enables to pin light on a certain location with a strong presence. This is intended to aid the director in diverting attention or leading the audience into different segments of the stage as the performance is played out. Exit signs has to be faced & located in such a manner that it does not spill light onto the stage and still keep within the safety requirements.

Main Curtain, Borders & Dress-legs

- Location
- Length & Depth
- Timing for curtain opening

Curtains play an important role in the theatre as they create a sense of expectation. (ie: what could be behind the curtains?) and a sense of richness in a performance. The curtains should be able to cover the performers and also keep light discipline. The width and length of the curtain dress-legs⁸ and borders⁹ should be calculated in view of lighting projections from the front of house and other lighting bars. Due to the close proximity of the "hot" lighting fixtures to the curtains there, should be a minimum clearance between them. The time taken for the Main curtains to open and close is important. A scenario like this should not happen - the curtain draws to a close for too long or takes too long to open.

Layout of Electrical and Control Points

- Dimmable Points
- Non-dimmable Points
- Lighting Control Points
- Spare Power

Dimmable points should be of the correct rating and type. It should be mounted rigidly with a proper metal trunking of sufficient gauge. The height of the

mounting should be considered with the location of the lighting bar and lighting fixture. Sufficient non-dimmable points should be available to cater for new types of fixtures that do require dimming. (eg: moving heads, scrollers and etc.)

Lighting control points comprise of DMX points and Ethernet points. They should be situated at various locations in the hall. Venues tend to go dry with DMX points, and these are now essential to have.

Not everyone would hire the audio and lighting services provided by the venue. Catering for spare power is also important as many rental companies might want to tap a clean source of power for both audio and lighting. Accessibility, location and safety is to be considered for this spare electrical power.

Please ensure that the incoming supply (Electrical Power) is sufficient to run the dimmers and other equipment in a venue as you may end up with a major black out during the final on-core.

Lighting Fixture Selection

As there are many types of lighting fixtures involved in a venue, equipping a venue with the correct type of fixture is important.

Profile

The Profile¹⁰ (A Commando in Lighting fixtures) can do almost everything what a classic theatre lighting should do as it can take multi-functional roles. It can create a wash, hard/soft beam effects and shape the light by using shutters. You can also change the diameter of the beam¹¹ of light using the iris and adjusting the lenses. Finally, it can have Images projected by way of Gobos. Due to its multi-functional role, the Profile lighting fixture costs more than the rest of the other generic lighting fixtures.

Every Lighting Designer will always complain of the lack of profiles in his or her venue.

After explaining very briefly of the importance of Profiles, it comes to me as a big surprise that many local government schools, have installed no Profiles in their venues .

Spots, Washes and Floods

Spots (Plano Convex)¹² are always required for any stage performance. Washes comes in various forms ie: Pars, Fresnel¹³ and Floods¹⁴, each displaying various characteristics in lumens¹⁵, spread and effects. A key accessory which is always omitted in a call for a tender for lightings in this category is the all

important Barn Doors. It seems that Barn doors¹⁶ no longer exist in some Singapore venues.

Intelligent Lighting

The use of moving heads has become popular in many venues in creating a spectacular sensation at a particular point in time. It has slowly progressed its way from the Discotheque, to the outdoor events and finally into the performance venues. They have wonderfully coloured, huge patterns rotating and gyrating to the left, right, top and bottom of the stage.

Is the moving head a distraction on stage rather than an enhancer of a performance?

An audience is to be focused on the performance and not to be distracted unless intentional. Sometimes we wonder whether we are watching a performance or are we watching the Moving heads rotate on stage, I guess the children are really rotating their heads with the performance of the moving heads!

Moving Heads can do damage in that area if not implemented correctly.

A moving head should only be used with a lot of thought and if it is appropriate for the performance – for instance a disco scene, a moving beam of a flying saucer, a scene of chaos, a highlight, etc . If possible it should be placed away from the view of

the audience if it is not to be the focus of the performance. It should be used in sensationalising a particular point in the event and not turned on all the time until it loses its effect.

Lumen

As there are many types of lightings involved in a venue, selection is also critical in terms of lumen power. Many venue's have under-rated the lumen power of the lighting fixtures. The light has no effect if the beam's projection is too weak. This is further made worse by the bad light discipline due to the design of the venue itself.



NOTES

- ¹ *(Variation Order) in which the client needs to pay for the changes made from the initial proposal.*
- ² *Catwalks – metal structures mounted on the ceiling where lighting or other equipment can be accessed for focusing and servicing.*
- ³ *DMX512 is a standard protocol by means of which theatre lighting control desks can communicate with lighting equipment.*
- ⁴ *A Moving Head is a lighting fixture that has a yoke and a Lamp attached to it with many other attributes and basically it moves up / down (Tilts) and left / right (Pans). It is in the category of lighting fixtures known as intelligent lightings.*
- ⁵ *Scrollers are special attachments to a lighting fixture. They contain several colour filters in a rolled format. It can be scrolled from one colour to another via DMX512 protocol.*
- ⁶ *The capacity for any person who is sitting at the audience area to view the entire performance area with the least or no amount of obstruction.*
- ⁷ *To ensure total darkness and no light spillage.*
- ⁸ *Dress-legs are curtains that are located on either side of the stage. They look like vertical hung banners of 1-2 meters in width.*
- ⁹ *Borders are short curtains situated near the ceiling and in between the lighting bars. They span horizontally the entire length of the stage.*
- ¹⁰ *Lighting fixtures that comprise of a fixed condenser lens and 2 adjustable convex lens with various attachments.*
- ¹¹ *Beam angle usually specified by the manufacturer for the lighting fixture – it shows the angle of dispersion of light.*
- ¹² *Lighting fixtures that comprise of an adjustable-reflector lamp housing and one fixed Plano Convex lens in front.*
- ¹³ *Lighting fixtures that comprise of an adjustable-reflector lamp housing and one fixed Fresnel lens in front.*
- ¹⁴ *Floods are generally used for ambient lighting and gives a wide spread.*
- ¹⁵ *The unit of luminous flux in the International System, equal to the amount of light given out through a solid angle by a source of one candela intensity radiating equally in all direction.*
- ¹⁶ *Barn Doors are 4 leaf flaps placed in front of the lighting fixture to shape/cut the light.*

If you have any comments or would like to get in touch with the contributor, please email PV Joseph at joseph@combinedcorp.com.sg