

How To Get A Laser Variance



Grant Kondourajian - GK Lighting

A Conversation With

Grant Kondourajian

With Tim Bennett

Of ArgonTV

How To Get A Variance

The following is a transcript of an interview between Tim Bennett ([ArgonTV](#)) and Grant Kondourajian ([GKLighting](#))

Based in U.S and need to get a variance? Then watch this very informative video:



Grant Kondourajian - GK Lighting

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How To Get A Laser Variance

Tim Bennett: How to get a laser variance is our topic on ArgonTV today.

I'm joined by Grant Kondourajian all the way from Chicago in Illinois from GKLighting and he's going to unravel the mystery of variance.

What is variance, why do I need one and how to get one...

This is especially useful for you if you are in the U.S. obviously and if you've just bought a new laser and you need to get all yourself sorted out legally.

So in a moment we're going to talk to Grant, I'm going to introduce you to Grant it's going to be really really awesome.

But welcome to ArgonTV, it's great to have you here and if this is your first time here, ArgonTV is a community of event-related people, where we talk about subjects relating to our industry from lasers to lighting to laser mapping to everything within the industry.

If you'd like to join the community, beneath this video there will be a little box where you can put your name and your email address and then you'll never get to miss another video and get all the free magazines, be part of the community and get all the help that you need.

So do that right now and then let's get back to Grant.

It's great to have Grant here.



Grant is from GKLighting and he's been in the industry for over 10 years and he's very experienced in the subject of laser variance and he's been working on projects from all over the world with some of the greatest partners, industry partners in the world and he works on things such as Christmas tree lighting, even concerts and conferences and you know the general live events that we are all part of.

He's (GKLighting) FDA approved, which is awesome, so it gives me great pleasure to welcome Grant to ArgonTV.

So Grant, it's great to have you here.

How are you my friend?

Grant Kondourajian: Hello thanks Tim.

Thanks so much for having me I'm stoked to be here.

Tim Bennett: It is awesome.

Thanks very much for being here and and as we were talking earlier over the last few days, you were saying how when you got started, which was a high school experience, I guess some kind of event and you were able to turn that into a professional business.

Maybe you could just introduce yourself a little bit, tell us you know, what you have been doing, a little bit about GKLighting.

Just introduce yourself so everyone knows who you are.



Grant Kondourajian: Sure absolutely!

I am Grant with GKLighting and well, like we were saying earlier, I've always been extremely interested in technical production to do with shows or architectural lighting.

Really anything involving that.

So always from the youngest age I can imagine, I would look back at the guys behind running the soundboard and I'd be like *"I want to be like them one day!"*

So basically, I just got involved as soon as I could in junior high and high school productions and really went from there.

I started in sound and there's always a plenty of sound people to go around, but there was never a lighting guy.

So I figured *"hey well why don't I take a look at this"* and see if I could figure it out.

So I really love that, because the creativity that comes along with lighting is huge and awesome and actually the first time that I ever saw lasers in real life was at a guitar center and it was the most basic cheap lasers you've ever seen in your life, but it was so amazing at that time, because I've never seen a coherent beam in my life and I was like *"I want to do that one day"* and that's where it all began.

Tim Bennett: Hey I don't think there's anything like seeing your first laser show.

It's like falling in love...

Grant Kondourajian: Yeah absolutely!

Tim Bennett: And that was exactly my reaction.

Actually I bought a club in England and I was kind of a naive businessman and my DJ came to me and said *"you know we have a laser here?"*

"What's a laser?" and I was the same, he turned it on and I was like *"Oh my God! My life just changed!"*

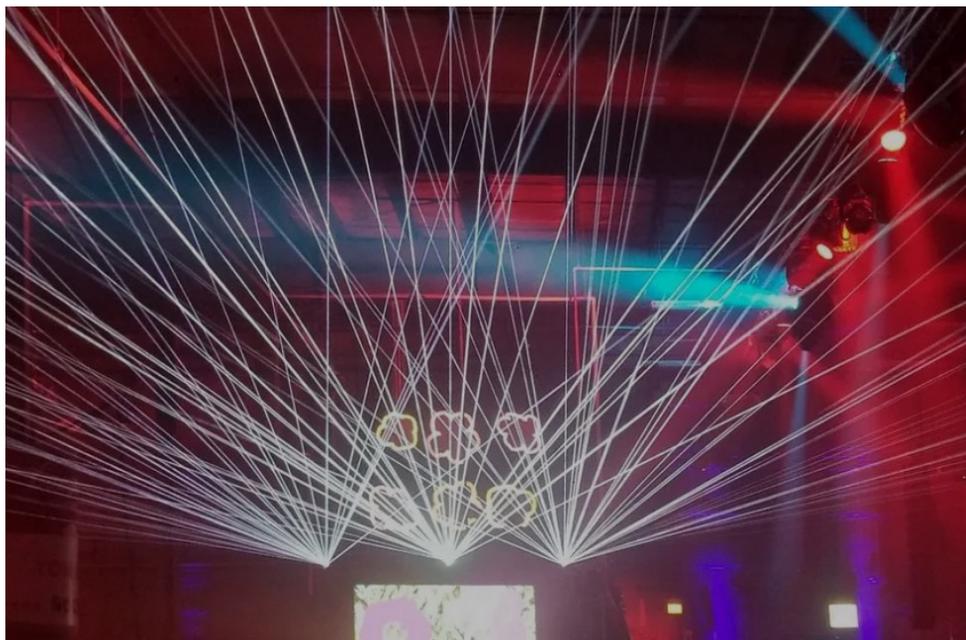
So I understand that feeling completely.

And then GKLighting, how did that all start and what do they do?

Grant Kondourajian: Sure, so I had... basically right out of high school I began freelancing and doing contract work with various companies in Chicago and I really liked lighting, but I didn't know any laser people and I knew that's really where my passion was.

So I decided to do some looking around and seeing what it takes to get first projector and I discovered Photon Lexicon, which is an amazing amazing resource for anyone looking into getting getting into lasers and I ended up picking up my first projector about two years ago.

Tim Bennett: That's pretty cool and just to show you some of Grant's work, this image behind me, is indeed one of Grant's shows.



So it's pretty cool... there's a few laser beams!

I like the way I'm surrounded by this halo of beams.

Grant Kondourajian: That was about... exactly one year ago.

That was a Halloween party for Soho House.

Tim Bennett: WOW!

Fantastic and how life has changed since you did that show.

Right... Exactly... a lot has changed.

Incredible.

Who'd have thought that this is where we'd be right now and how is this pandemic affecting you and your company?

What are you doing right now with that?

Grant Kondourajian: Well... so basically our... the whole industry has has done a switch.

You know, instead of someone coming to us, asking for our equipment or our services, you know, essentially, we are the ones promoting ourselves to do these events.

Such as drive-ins and live streams with artists.

So it's totally done a flip-flop and it's crazy, you know, how we've all come together to try and keep our industry going as much as we can of course.

So I've been focusing a lot with live streams.

Tim Bennett: Yeah, it's actually very incredible how the whole industry has shifted as you say, and I think it's going to be like this for quite a while.

I believe that the, even you know, even when this is all over and people can say *"oh you can go back to normal now"*

I think all this live stream and online virtual events are going to stay around, because it's so much cheaper for a company to do a virtual event than to go and hire a venue, put all the lights and sound in and everything.

The huge cost of that and I think this is going to stay for a while.

So, you know, to get into this right now, I think it's you know it's an excellent thing to do.

And yes definitely the community needs to work together, in order to survive and thrive.

Grant Kondourajian: Totally!

Tim Bennett: And you know, in every bad element there's a seed of good and I think, you know, we need to find that seed of good and and work it to death.

So great. Yeah! So awesome!

So thanks for being here.

We're just gonna take a very short break and I'm talking to Grant about how to get a laser variance and we're gonna unravel that in just a moment, so don't go away.

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Tim Bennett: Welcome back to ArgonTV.

(The following is a walk-through of the forms, so it will really help if you have the forms with you as you read this)

I'm here with Grant and we are talking about how to get a laser variance.

And just to give some background to why this interview all started, a very good friend of mine, Dan, just bought himself a new laser.

So shout out to Dan... and he's based in the U.S and he called me up and he said *"how the hell do I get a variance?"* and I said *"I have no idea!"*

I don't live in the U.S.

I don't even know what a variance is."

So I put a shout out on Facebook and Grant was the first person to respond to it,

so Grant is here today.

Thank you for doing that Grant.

It's awesome sharing your knowledge.

So that's how it all started, so maybe we can start talking about a variance...

First of all what is a variance?

Grant Kondourajian: Sure!

So a variance is permission from the United States government to vary from the laws that they have in place, which says that you can't use a laser over five milliwatts in public.

So inside of your own home, it's okay, because you're putting yourself at risk, but in public you cannot.

Absolutely not!

So variance basically says to the government that you've understood the safety procedures that they have in place and you're safe to do these shows.

Tim Bennett: Okay, So in order to get a variance do you need to have safety training of any kind or do you just you know, as long as you're aware of the the risks and the hazards, it's sufficient?

Grant Kondourajian: Actually you don't... of course I always recommend the ILDA Laser Safety Officer course.

It's fantastic, but you don't need any specific training, but what you do do, is you're essentially signing an agreement, that says you're going to abide by the following rules, most importantly being that the lasers are 10 feet or 3 meters off the floor, that the audience can stand on.

Tim Bennett: Okay and when you say, if you're doing lasers at home, if the laser goes out the window, does that then become public?

Grant Kondourajian: You know, that's a good question I would say yes.

There's always, you know, a little bit of of gray areas and different scenarios, but I would always recommend covering your windows, if you're doing a show indoors.

You know, you don't want the beams leaving anywhere, especially if it's going into airspace, that's where you can get into a lot of trouble.

Tim Bennett: So the variance is held by who?

Is it the person, or is it the equipment or?

Grant Kondourajian: So the variance is for laser light shows.

So under the variance terminology, you are the manufacturer of the laser light show.

It can be a little bit confusing, because manufacturer, we we assume is to do with a specific product, but in this case the product is the show.

So the variance goes to either the operator or the company that the laser belongs to.

So how that works is, if the company has a variance, then its employees can operate under that variance.

Tim Bennett: Okay that's awesome and that would apply to freelance as well, presumably?

Grant Kondourajian: Correct yeah... so freelancers...

No sorry I misspoke... they have to be actual employees.

Contractors wouldn't count as employees.

So they would need their own variance.

Tim Bennett: Okay that's interesting.

So in your case for example, GKLighting would hold the variance?

Grant Kondourajian: Correct yes!

Tim Bennett: Okay... that's interesting.

So when it comes to equipment I understand that the equipment does need some kind of documentation?

Do you know anything about that?

Grant Kondourajian: Sure, so that's called an equipment product report.

So that's what the manufacturer of the product will submit to the CDRH, which gives them full documentation of how the laser is built and what components are in there and there's also a long list of rules that they have to fulfill in order for the laser to be legal, U.S legal.

Now the interesting thing is, when you submit that report, the FDA is going to send you a letter that they received it, they're never going to approve it, so if at any point an issue comes up from someone contacting the FDA about your product, then they can take a look at that and say *"oh no, this isn't right."*

You have to recall this."

So they can at any time, take a look at your product report.

Tim Bennett: Okay, I think that's actually quite good, it really puts the onus on the operator to be a good boy and behave and you know act responsibly.

So to get this report of the equipment, who would provide that?

Grant Kondourajian: Well like in Dan's case, he bought the laser from Pangolin and Kvant, would he go to Pangolin and say *"can you give me the report?"*

So how that works is Pangolin submits the product report, for the product itself, which gives them full schematics of everything, including the e-stop and the safety system, so what they get back from that, like I said, that acknowledgement letter.

There's what's called an accession number, so when you're applying for your variance, you input that number, which tells the FDA which product you are owning and creating the show with.

Tim Bennett: Okay, so Dan would need to ask Pangolin to give it to him or to

submit it directly to the FDA?

Grant Kondourajian: So Dan could ask Pangolin to give him that number.

I know Pangolin also offers a service of which they can submit the variance on behalf of you and then they'll handle all of it, but Dan could easily ask Pangolin for that number, or he could actually, probably find it publicly as well.

There is a website called [regulations.gov](https://www.regulations.gov) and on there, are all of the laser variances that have been submitted.

So you can go in there and search someone's name and find the variance that they submitted for their products or their show report or anything that they've interacted with the CDRH.

Tim Bennett: Okay, that's very interesting, and it's my understanding, correct me if I'm wrong, that the companies that submit the product report, have to be approved by the U.S government.

Like you can't just literally fly Chinese lasers in and get a variance for them?

Is that correct?

Grant Kondourajian: That's correct.

So that acknowledgement letter that I was telling you about, is what you need in order for it to be legal, but as we were talking about before, it has to comply with their rules as well, so if you weren't to comply with those rules and you apply for a product report and they don't catch it originally and someone buys the product, submits a variance, for that product and someone gets injured, then the manufacturer would be liable.

Tim Bennett: Okay that's really interesting.

So like you're saying earlier, it's a lot of responsibility that you are following the rules that are in place.

Grant Kondourajian: Yeah definitely.

Tim Bennett: Okay that's... that's really interesting.

This is all good news for me and I'm sure this is going to help a lot of people.

Now when it comes to doing a show at a venue, for example, does the venue itself need to have a variance for lasers or how do they get permission?

Grant Kondourajian: Well, so the venue is a company, and as we said before a company can have a variance.

So for example, if a club had lasers permanently installed, they would want to have a variance, but if it's just a concert venue and they don't have any lasers, they don't need any variants at all.

That's just up to the operator of the the show.

Tim Bennett: Okay and if it was a one-day event, would they still need to get one?

Grant Kondourajian: The operator would need one, but the venue does not need one.

Tim Bennett: Okay great fantastic.

It sounds like a pretty complex system.

Grant Kondourajian: It is... it is... lots of gray area too.

Tim Bennett: Yeah, so you have some of the forms that we need.

Can we can we take a look at some of those?

Grant Kondourajian: Sure!

Tim Bennett: And just do a quick walk-through.

I mean, we don't have to spend hours on it, but you should be able to do a screen share.

Grant Kondourajian: Let's see...

All right, can you see it there?

Tim Bennett: Yep I can see that great.

Grant Kondourajian: Great.

So what I have here are the 3 forms that you'll be submitting for your initial variance and that is comprised of the variance cover sheet, which is a brand new thing introduced by the CDRH...

Tim Bennett: What id the CDRH?

Grant Kondourajian: So the CDRH is the [Center of Devices and Radiological Health](#). and that's the more specific division of the FDA that we're talking about.

So the FDA is like the general governing body and the CDRH is more specific within the FDA,

So that's the cover sheet and then you have the the variance application itself, and then part of the variance that you have to, part of the thing that you have to fulfill in order for the variance to be approved, is the reporting guide for laser light shows.

So we can just walk through these real quick.

So fairly simple, the variance applicant, all of their information and the submitter contact information would be, in your friend's case, if he had Pangolin submit it for them, they would input their information here, and you're submitting for a laser light show.

Which is the original, you can file an amendment, if you're, if you were to buy new products that aren't listed on your variance, you can file an amendment, which says *"hey you know, this is what changed,"* and then the laser light show report, which is the the last document and the longest document.

So that's just a basic checklist.

That's the first thing, name, address, name and title, what you put here is your name and then President or Manager or whatever you know is fair, and variances generally run for two years, so you put 2 years there, but as long as you do your annual report, it's automatically renewed.

And the annual report is due in September and that's, the last form that I have here which we can take a look at if you'd like.

So the the product for which a variance is requested, we're talking about a laser light show, we're not talking about a display device or a projector.

That's just for the manufacturer.

And products is intended for use in any of the following.

That's fairly straightforward.

You can check as many of them or as little as you'd like.

Intended to be used at a variety of locations.

And at one location for more than 15 days, you might you might put in the tour box, you might put "*not applicable*," or you might put "*other*" for a variety of applications, so you could just say in broad general terms, it's variable based on the show.

And they'll accept that.

Under here, projector utilizes the following laser effects, the ones that you don't want to check, are [audience scanning](#) and stationary radiation of rotating mirror balls or scanning irradiation of rotating mirror balls.

Those are special aspects that you have to file more paperwork for and generally audience scanning variances are an amendment.

They're not going to be your first variance that you file, because there's a lot that goes along with it, a lot of responsibility.

Under here are the radiation levels for your projector.

So projectors these days are going to be diode and your red would be 637nm.

Sorry I should say direct diode to be more specific, and I'm going to throw DPSS on there as well, for our green.

So 520 through 532 nanometers and direct diode for 445 nanometers and then peak power, you know, you want to give yourself a broad range if you do decide to expand your laser inventory, you know, you might as well just put the highest power you could ever imagine.

So I'm going to say 50 watts for each.

Number 9 is a tricky one.

It requires a more expanded horizon of understanding of how laser works and if you're new to it, you know, it may be hard to understand at 1st, but that's totally okay.

So what you want to put there, is this very specific sentence, which everybody puts on their variances.

So obviously, we want to be very clear that we're not using pulsed lasers, what we're using are *"continuous wave diodes, with no high peak power like pulsed lasers."*

DC to 2KHz, zero to 120 degrees, peak to peak, full optical angle x and y, referring to your scan angle and pulse duration from scanning exposure is variable based on your scan rate and what effects you're doing."

Of course graphics, hot beams, you know, whatever that might be and this is generally accepted by the CDRH and you are going to comply with 21 CFR 1040.11, which you know anybody can look it up.

It's very boring, very lengthy, but essentially it just goes through all the requirements that you have to meet.

And let's keep going...

So you are deviating from the requirements of applicable standard, which is going back to that five milliwatts, that we talked about before.

So you're deviating from that and it's saying that you are exceeding that.

Tim Bennett: Okay got that! That's interesting.

Grant Kondourajian: So this is just saying that you're using the... as much power as required and no more.

So you know, whatever that means for your application, and then, so going to, back to when I was talking about the list of things that you are essentially signing and agreeing to with your variance, that are required for everyone to know, every laser operator to know, is all of this stuff here.

So all laser product systems shows and projectors will certify comply and all of this will be accomplished prior to introduction into commerce, so you're you're going to check all these.

Effects not specifically indicated will not be performed.

Of course scanning projection and reflecting... reflection of lasers and collateral

radiation into audience and other accessible uncontrolled areas will not be permitted.

Laser radiation levels in excess of the limits of class 1 will not be permitted at any point less than 3 meters above any surface upon which persons other than operators, performers or employees are permitted to stand.

So that's what I was talking about earlier, where it... that 3 meter rule from the floor, really only applies to the audience.

So for example, on stage you don't need to be 3 meters above the performers heads, as long as they understand the dangers of what they're capable of, you know, of course you want to be as cautious as possible, but that's not a requirement per se.

Tim Bennett: Yeah and that's an interesting point that you make, that, that of course doesn't excuse the operator from any safety precautions for the performance or anyone on stage.

They still have to take into consideration the safety aspect of that so it doesn't...

Really this is really awesome.

Grant Kondourajian: Right! Absolutely! Absolutely!

Any product which relies on scanning to meet access exposure or product class limits will incorporate a scanning safeguard system, which directly senses a scanner motion.

So this is a... this can be physical or not, this is more recent change it used to be, it had to be a physical shutter, but now you can use relays to sense a scanner stoppage to cut the power, not power, cut the signal to the lasers.

Cutting power doesn't actually fulfill that, because you still have capacitors that could discharge and there's still a danger that there could be a laser beam exiting that.

Most, most high quality lasers use a physical shutter, which is some of the clanking that you'll hear inside your projector when you're turning on a cue or off a cue.

You'll hear it tick tick tick tick tick tick

All laser light shows shall be under the direct and personal control of trained competent operators.

Again very general, you know it's assuming that they've taken the proper measures to train their employees.

So the employee of a variance holder, which is what we talked about earlier, and be located where all beam paths can be directly observed at all times and immediately terminate the emission of light show in addition of, in the event of an unsafe condition.

So that's just, you know, have an e-stop (emergency stop) in your hand, have an extra person there, an extra set of eyes, is always important.

So check that and going back to here same thing,

Do not exceed the level required to obtain the intended effects.

Projection system will be securely mounted or immobilized.

And here is a very interesting one, laser projectors will not be delivered to any

other party under an agreement of sale, lease or loan unless, and until the recipient demonstrates that they have a variance in effect at the time of delivery, that permits them to produce laser light shows incorporating such projectors.

This is a big problem that we have in the U.S right now.

A few, not to name anyone specifically, big manufacturers will ship projectors to people that don't actually have variances yet.

They might have applied, but they're not supposed to send the projector until the variance is approved.

Tim Bennett: So does that also take in consideration individuals who want to sell their lasers?

Grant Kondourajian: Yes! So if you are a variance holder and you own a laser projector, it's your responsibility to check and make sure that the recipient has their variance.

Otherwise that recipient will... it's assumed that if you don't have your variance, you're not aware of all of these rules in place to keep the show safe.

In addition to the requirements of [21 CFR 1040.10](#), the manufacturer of the laser projection systems, will provide the parties who purchase, lease or borrow the equipment, adequate user instructions for safe installation of operation.

That's pretty self-explanatory.

I sure hope they do that.

And then the requirements of [21 CFR 1002.30](#) will be accomplished through the

use of written procedures for setup alignment testing and performance for each show.

So this goes into the extra documents that you attach.

So with the variance, what you need is the cover page, the variance application, the light show report, you need this written procedures for setup alignment and testing, a sample form, which just shows them that you have all the boxes ready to go, ready to be filled for your first show, you also need a drawing, which shows them a basic setup of your show, preferably 3D.

So they know that you're aware what needs to be done for a safe show.

Tim Bennett: Do you need to submit a separate one of those for every show or is it just like, one covering everything?

Grant Kondourajian: This is your very first initial variance application, so you don't need a drawing for every show, but you do need to do this written procedures for every show.

Which I can show you that document as well.

It's fairly simple, it's not super complicated to complete, but that's actually an attachment of the light show report, which we'll get to shortly.

And just let me know you can stop me at any time, if I'm going too long.

Tim Bennett: Now I actually think this is very comprehensive.

This is the first time I've ever seen this form and I think it's a great step forward in fact, to keep lasers safe.

I've often thought that, you know people, shouldn't be allowed to buy fireworks and lasers, unless you are a business, because of the potential hazards with them, and this is a great step forward in ensuring that only people who know what they're doing have a laser in their hands.

So would this cover laser pointers as well?

Grant Kondourajian: Technically laser pointers do fall under this, in the case where if you don't have a variance, you're not allowed to use those one watt blue burning lasers in public.

You know.... Yeah!

Especially not at aircraft, but that's, you know, you'd think that's self-explanatory, but those people are enjoying their prison time!

And then the final box right here, is an advanced written notification, which will be made as early as possible, to appropriate federal state and local authorities, providing show itinerary with dates and locations.

So just, you know, saying to the Illinois state, here's the show that we're about to perform, now you know!

It's really, it's really quite simple.

And then more information if the submitter is different from the applicant.

And signature!

So that's that form.

Next we will move on to the laser light show report.

Tim Bennett: Is this the annual report that you were talking about or is it that different?

Grant Kondourajian: This is not the annual report.

This goes along with the variance application.

So this is a requirement.

So if you submit your variance application at the CDRH, without this they probably won't even respond at all.

They might say "*hey you need to give us this as well,*" but there's a chance that they won't even respond at all, because they're very busy.

So we're going to scroll all the way down here, to where it begins.

This is actually page nine, the rest is just instructions, where to send it, stuff like that.

So again the manufacturer address, name and title, telephone number, email, same stuff as the variance.

And submitter, person preparing report.

Importing agent, that's not applicable.

Is this pursuant to 21 CFR 1002?

Yes!

It's a new laser light show report and this is not applicable, because it's new.

What is / are the name(s) of the light show display?

You know, this is going to be more of a general thing, than specific, so you can just put your company name laser light show, and that, that'll be sufficient.

So you're attaching a copy of your variance, which is as expected.

Let me just briefly talk about the difference that's changed within the past couple weeks.

So previously, what you had to do, was take all of these documents, [mail them to the CDRH and mail them to the FDA.](#)

Very painful, very slow and you know, sometimes there's... it's unsure if they even received it, because someone signed for it, but did it really make it to the right person's desk?

You know, you never know!

So, what they did now, is all of these documents, get put in an email and sent to the CDRH directly and they will forward it to the FDA.

So it's a huge, huge step forward in that regard.

So you're attaching a copy of your variance in an email.

So you're going to say yes.

No, the approval letter is not attached, because I'm not approved yet, and here's where you're going to insert your equipment.

So for your friend, you would put Kvant and I think you said Unity Elite, whatever power, and then they would put in their accession number for that product.

Moving on again, same questions is on the variance, you can check as many as you'd like.

I recommend just checking them all.

Cover your bases.

Same questions, specific locations, date, times for the show.

If you know you're going to do a show at Christmas, you know just put it on there.

It can't hurt!

Same questions here, again, avoid audience scanning at all costs, unless you know exactly what you're doing.

And so, here's part nine.

So 9.1 provide both a plan and elevation drawings with dimensions of the show or display.

So I should have that here somewhere...

Tim Bennett: While you're hunting that out Grant, I know that in the U.S you have all these different states, does one variance cover all states or do you have to submit a different variance for each state that you go into?

Grant Kondourajian: So this variance is federal.

So it covers everything for the whole country, but one thing that's certainly important is checking your state and local laws, because certain locations require permits, because they consider it to be like a pyro device, because it is actually, you know possible, to ignite vulnerable objects, such as curtains or wood or whatever might be in the way and other states require special licenses like New York.

You need, you need a broad general laser license, which incorporates lots of different industries and it's very hard to take, so there's a group of certified Class B mobile laser operators in New York, that most people just hire out to come to the show, to fulfill that, okay and they do inspections in New York.

Tim Bennett: Yeah! WOW! They used to in England as well. I'm not sure if they still do that, but one of the things I was going to say and I think this is a good point, good time to say...

Grant and I are not legal advisers in any way, we're just sharing information for your benefit and we recommend that you do take the appropriate advice from your local council, your local health and safety people, FDA's, etc, so you know, don't hold us responsible for anything.

Grant Kondourajian: Right

I've been in this industry for a couple of years and I've taken in a lot of information from certain people and you know you can always fact check me at

lasershowssafety.info is a website that's run by ILDA and we can link that I'm sure.

It's super helpful if you're in the U.S because they list everything out very clearly.

What the laws are, what you need to do, so that's a great resource, it's very black and white as far as the laws say.

Tim Bennett: Well I will link to that!

Grant Kondourajian: Feel free to fact check me on there...

Tim Bennett: yeah... cool!

Okay so look at this diagram.

Grant Kondourajian: Right, so here we're looking at a tour and so this variance was submitted specifically for this lighting designer for the tour.

So we can see here the basic drawing which shows what the lasers are doing.

I can zoom out a little bit here... shows our termination wall and then here's a plan view.

Not the best drawing, but you know what, it's better than pen and paper.

So they will absolutely accept this, but essentially what you're showing is, that the beams are well above the minimum height for the audience, that's available, well above the height of the floor that the audience is able to stand on, as you can see.

Tim Bennett: This is awesome Grant and I notice in this diagram you have four lasers, if you were to increase that to say 20 lasers, would you have to submit a new diagram or is this good enough?

Grant Kondourajian: No... this is just a general diagram.

It doesn't have to be super specific.

In this case it is specific, because it's for this tour, but this is going to cover everything that this lighting designer is going to do. right there.

So you'll attach that... drawings attached? Yes

Describe how each of the radiation levels indicate on the drawings above were determined.

No... there's no calculations attached, we're not doing audience scanning, so that level of detail isn't really necessary you know, they just need to know the power of your systems, which you've put

Audience scanning?

No.

Laser radiation to be viewed by operators performers or employees...

I would generally put no here, let me just see...

I'm just referencing some that I have submitted in the past.

Right! so we're going to put no there, because there's no reason for the performers or employees to look at the beams.

If so, you've seen in some of Kvant's videos, they're all wearing laser safety goggles.

If the answer is yes, that's more applicable to audience scanning, so we're gonna say no!

And also no

Tim Bennett: So this, this is covering like performers on a stage, for example?

Grant Kondourajian: Correct Yes.

So will laser radiation greater than class 1 strike, but not be viewed by operators?

Essentially their back or maybe their feet for any reason, will it have contact with their skin?

You know, I would stay safe on that side and just say no.

Yeah and I would recommend following what you say and not doing it.

Tim Bennett: Does anyone come and actually check the shows?

Grant Kondourajian: So the thing is, they they won't be investigating you, unless they get a report, unless you're in New York, that's a specific case where they absolutely will come and inspect your shows.

There's a group of inspectors in New York that do lots of other things as well as laser shows, so those New York Class B mobile laser operators know those people, so they know exactly what you need to do on that show day, for them to walk in and say everything looks good, you're good to go.

So they're definitely important to have, so likely no, your show won't be inspected.

Continuing on...

Under continuous control of an operator?

Yes.

If you're submitting a variance for a very specific installation, you may check no, but in that case you have to prove that you have a safety system in place to shut it down, without an operator.

Laser perform tests in addition to operation of the laser projector.

No.

Can operators see all the beam paths?

Yes operators see all the beam paths.

Any personnel assist in providing surveillance of the laser display?

I'm going to say yes and I'm going to put a note that we have an LSO (Laser Safety Officer) on site as well as an assistant to watch the beam paths while the

LSO's actually programming things.

Make sure that no janitor is going to walk through, you know the balcony, where you're zoning, while you're not paying attention.

That would not be good!

And what qualifications are required for laser operators for your show?

You can put a pretty general answer there.

For me, this is my answer I just say a laser operator's variance or a laser safety course laser safety training course.

Tim Bennett: So it's really going to help you if you have had a [laser safety course](#) yes?

Grant Kondourajian: Oh absolutely big time!

Tim Bennett: I mean, I personally don't think anyone should operate a laser without one, personally, but there you go!

Grant Kondourajian: Right yeah!

The ILDA one taught by Patrick Murphy, he's an absolute legend in the industry, who knows all the ins and outs and actually has helped write some of these rules.

So he knows them better than anybody else.

So he's definitely a great person to have in contact and going along with that you know, ILDA in general, is a great organization which is helpful for new laserists to learn

So we're going to say not applicable here, because our show is always under the continuous operation, and then again these aren't really applicable, because they're going off of this question here,

So here... is one readily accessible control or more provided to me to immediately terminate laser radiation?

That's referring to your emergency stop, so you know, however many you want to put in your system, I would say a minimum of two, just to be safe.

You know you could put one on stage and one up front of house.

Whatever you feel is necessary to see all the beam paths at the same time.

Describe these locations...

You know, as we just talked about, attach a copy of the written setup alignment and test procedures.

This was that additional attachment that we were talking about earlier, which I will pull up here shortly.

So here, it's just fairly short three / four pages and in fact at the end of this document, there's a guide to all of the questions that you need.

So if we scroll all the way down here, you can see it says "*sample checklist*," so they're just showing you everything that needs to be on that checklist.

So you can always refer to this to make up your own checklist.

It's pretty pretty straightforward and also just a note, that website, lasersafetyshow.info has links to all of these forms.

Tim Bennett: All right great!

So they can [download the forms](#) from there, fill them in and then submit them?

Grant Kondourajian: Correct yes.

Tim Bennett: Okay!

Grant Kondourajian: Correct, and you know the thing is when you're buying a brand new laser, the manufacturer really...

I'm almost sure, is willing to help you with these forms.

So if it's your very first time send it to them first and have them take a look at it and say *"okay you know, maybe change this wording here..."*

You really don't need to be specific on this, they're not looking for anything super specific so, you can be fairly vague!

Tim Bennett: Yeah that's a good little tip.

I mean I think these forms are very comprehensive.

I am amazed at how deep they do go, but I think it's a good indication to an operator, especially like as we were talking earlier, there's a lot of lighting

designers coming into lasers right now, and you know, there's a thought that they're just... laser is just another light and I, you know, I can just use it the same way.

Clearly these forms show that you can't use it in just the same way and it hopefully it will make people step back a little bit and say, *"you know I need to take some care with with a laser, get the proper training and put it in the hands of the right people."*

So I think this is excellent.

Grant Kondourajian: Right, yeah, exactly and this is really just scratching the surface as far as what happens in the U.S, that LSO course, will will dive far deeper into, not just what the rules are, but why they exist and the calculations that go into these sort of procedures.

Tim Bennett: What happens if somebody operates a laser without a variance and submitting all these documents?

Grant Kondourajian: So if they decide not to follow these laws, there's a few things that can happen.

They might be reported to the CDRH and the CDRH will send them a cease and desist and say *"hey you can't do this anymore"* and then when that person eventually does go to apply for their variance, the CDRH is going to make them jump through many more hoops.

Possibly even an in-person inspection depending on, you know, how bad their original offense was.

But going from a different perspective, the legal perspective, if that person was to be responsible for injury due to their own negligence for not learning what they need to learn, well then there's gonna be a really big lawsuit coming their

way.

As opposed to you know an LSO who can say, all this all the proper steps were in place, we did everything we can, this was due to the audience negligence or due to the projector manufacturer's failure.

You know any of those things, so just covering your own bases, it's best to have a variance.

Tim Bennett: Yeah, so what you're saying is take it seriously!

Grant Kondourajian: Yeah I mean, as seriously as you want to be taken, essentially, so (going back to the form...)

Yes, these procedures are attached and when are these performed, you know, you can say the day of, the day before, I usually say the day prior.

What laser radiation levels are used during setup?

Minimum required, you don't have to put any specific number, just minimum required.

That will, that will be good.

Written record maintained...

Yep, so you take that, that record for that show and you sort it away, so in case you come to your annual report, the CDRH says *"hey we got a report of someone who got injured during that show,"* you can say *"hey look here's everything I did, no one was injured from me, it was from a pointer or something else you know."*

What procedures are filed for notification?

Notification letter was sent to all local agencies that have jurisdiction in this area and then you attach a letter, which I have an example here,

Tim Bennett: And that's an interesting point you just made, to keep a report on the show, because it is very possible that somebody in the audience has a laser pointer, for example, and then they're flashing it around and they hurt someone and someone makes a complaint and if you don't have this report of the show then you could be, you know held responsible for something you haven't done.

Grant Kondourajian: Right and honestly, even if it's something where it was last week and you could say "*hey I remember doing this, everything was safe,*" but if it wasn't last week, if it was six months ago, you might not remember, you know, so it's written down documentation and the it's just good to have, you know like you're saying.

Tim Bennett: Excellent!

Grant Kondourajian: So show notification, is that, so you'll put yes there and yes there and list the agencies that you would contact.

Again no need to be specific, just be very general.

So that is pretty much it for the laser light show report.

So what you're going to do, is submit the cover letter, the variance, the show report and all the supporting documents, put that in email and send it to the CDRH.

Let me find that email address, which I should have somewhere...

One moment please...

Well I don't actually have it handy...

Tim Bennett: Yeah... Just shoot it to me later and then I can always add it in.

Grant Kondourajian: Sure we can link to it... we can link to it later.

Here is the email address: RadHealthCustomerService@fda.hhs.gov

Tim Bennett: Brilliant! I mean, that that's really uh an exhaustive walk-through.

So fantastic I really appreciate that.

And you know you were talking about the annual report, this needs to be done September you said?

Grant Kondourajian: Yes

Yes, let me show that as well, if you'd like...

Tim Bennett: Yep.

Grant Kondourajian: It's very simple.

Where did I put that?

Okay here we go let me go back to screen share...

So guide for preparing annual reports...

So what this is going to be, is an instruction page, followed by... followed by the form itself, so you have instructions page one and then you're gonna follow these instructions.

It's very straightforward.

Input all the information and you don't actually have to send in the instruction page itself, only the forms that you fill in.

So you're going to put all of your information as we talked about before.

The annual report is submitted in accordance 21 CFR 1002.13, for the certain date range.

So, for example, it's too late now to submit it for last year, but what I would put is 2019... July 1st 2019 through June 30th 2020, and you're gonna check one of these four:

Products were manufactured, meaning the show itself, not a physical product, and another instructions page.

Again, list your projectors that you have, that are active or discontinued, you can put when they were either sold or retired.

Your laser light shows themselves, you want to list them.

Another instructions page, again written procedures... Yes and reports provide to the CDRH for each model family currently in production...

Yes

And this is going to list your shows that you've done here, and number produced, so say I did 1 show, one drive-in show, but it was actually 3 shows, you know, in one night, so you put that there, number tested performance requirements, obviously you test once and then number tested labels you're just gonna put 1 for each projector that you have there, because you're going to perform one test for each projector.

Correspondence concerning radiation safety...

So this would be, for example, if you, if the FDA was to crack down on a certain person or a certain manufacturer who made a mistake in their projector and you received that, you'd say "*well okay one*" or hopefully not more than one and here is similar thing, except instead of failures you're talking about repair and you might do all that yourself, so you won't receive any letters, you know.

A number of notices or brochures sent to users dealers or service personnel on precautions...

So that would be, for example, show notifications.

Same type thing, however many of those you sent out and then you would just attach that here.

It was the same letter that we had before.

And where your records were kept, most likely it's where your your equipment is stored.

And products can be traced from these records depending on what you input it in there, I mean, likely you put your serial number in there, so you could put that,

that's how you trace each specific product.

Otherwise, if you were making your own projectors, you might put the data manufacturer, if you don't have official serial number.

And that pretty much completes the annual report there.

Like I said, it... this is really straightforward really simple.

They make this pretty easy, but if there is an issue, then they can go back to you and ask about that specific event.

Tim Bennett: Great and if you don't submit an annual report is there a penalty for that or is it a legal requirement?

Grant Kondourajian: If you don't submit an annual report, your variance expires and you have to reapply.

Tim Bennett: WOW!

You don't want to do that, because it looks it looks like it's...

Grant Kondourajian: Right! So going back down to that one question, you might want to submit an annual report even if no products were manufactured during this period, but firms still in business.

So just telling them, *"we didn't do any shows, but we're going to... so don't expire our variance."*

Tim Bennett: Good point! Yeah indeed and as I said earlier, you know, Grant

and I are not legal representatives here, we're just sharing advice... and this does apply mainly to the U.S, but I would recommend that no matter where you are in the world, that you check your local laws and your federal laws, country laws, with regard to lasers, because laser is indeed potentially a hazardous product and even used in the wrong hands can cause harm.

So I... in The Philippines, we have almost zero regulations when it comes to laser and it's really self-regulating, but I like the idea of keeping a report on each show, I think that's something that we will definitely start implementing on a show basis and I also like the idea of just complying with the forms even though we don't have to actually submit them, because as I say there's no requirement here to do so.

So I think it's a great.

I want to thank you first of all, for doing this walk-through for us.

Grant Kondourajian: Absolutely I'm happy to... this was definitely one area where I struggled my very first time, but I had some help from some awesome people.

Tim Bennett: Yeah that's good and I'm sure you, don't mind helping people out if they get stuck...

Grant Kondourajian: Oh no, not at all.

Tim Bennett: But I'm equally sure that you don't want 10,000 people calling up and saying "*hey Grant can you help me out?*"

So what I would recommend, in the beginning, is that if you have bought a laser, go back to the manufacturer.

Grant Kondourajian: Absolutely!

Tim Bennett: You know, as Grant suggested, give them the forms, ask them to help you first, talk to your, you know, local legal people and if you really, really get stuck then maybe shoot Grant an email and say "*help.*"

Grant Kondourajian: Me or actually John Ward, I'm sure you're familiar with him, he does all the submissions for Pangolin or I know you interviewed Roberta as well.

This is a big part of her business as well.

So she's happy to do this also.

Tim Bennett: Great yes and indeed we did, I think [Roberta Mchattan was our second interview](#) that we did and she is a laser safety officer and I'll put her contact details in this, as well, but she's a great resource to have and she'd be more than happy to help you.

Grant Kondourajian: Okay well... I believe his (John Ward) company name is [Laser Ninja Productions.](#)

Tim Bennett: Okay yes I've heard of them.

Yeah, great, well, thank you Grant for doing this walk-through and sharing your knowledge and taking the time to actually do this.

I think it's going to be so helpful to a lot of people.

So I really appreciate it and even though it doesn't actually apply to me,

I found it extremely interesting and what I do like to see is as we were talking about, you know how many new lighting directors and designers are coming into laser, I think it really shows to them that they need to take laser seriously and you know, I recommend everyone doing a laser safety course of some kind.

Grant Kondourajian: Definitely!

Tim Bennett: So thank you for being here I really appreciate it.

How do people get in touch with you, you know, should they wish?

Do you have a website or something?

Grant Kondourajian: Sure

My website is gklighting.net you can send me an email on there or give me a call or even Facebook messenger, now is super vital to our businesses.

So that works as well too.

Tim Bennett: Yeah well, that's how we met... Facebook

Grant Kondourajian: That's right!

Tim Bennett: Yep you're not friends really until your friends in Facebook.

Yeah so awesome Grant thank you very much for your time, for being here today.

Very much appreciated taking the time to be on ArgonTV and I hope you come

back again one day.

Grant Kondourajian: That would be awesome.

Tim Bennett: Okay so we have been talking with Grant from GKLighting about how to get a laser variance,

I hope you found this very very interesting if you have any questions and you want to reach out to me at ArgonTV, to connect to any of the people that I've interviewed, including Grant just beneath this video, go fill in the name and your email address in the box, you'll get connected into me directly.

You can send me an email anytime you want, you'll get all the free videos, all the free magazines that we do and you'll be (Grant that is...) in the November edition.

I'm actually gonna delay the November edition until about November 3rd, just so I can get you in it Grant.

Grant Kondourajian: Awesome.

Tim Bennett: Yeah so you get all the magazines, you get all the videos, you get connected into the community, and very very soon we're actually going to move over to ArgonTV.com so we'll be building the whole community there, so that we can all help each other... and you know, healthy and wealthy in the future.

So Grant thank you very much for being here really appreciate it and to the audience, you're all magnificent, and we wish you a very happy year, because it's been a very trying year, but let's all work together and make the best for the future.

So we'll see you all again in another episode of ArgonTV very very soon.

This is Tim Bennett wishing you an awesome day!

This post was about How To Get A Laser Variance.

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