



► **NATEAC Transcript #2008.109**

Designing a Safe Work Space: Thoughts on Backstage Careers Without Injury

**Panelists: Eddie Raymond (Moderator), Drew Landmesser,
Monona Rossol and Darrell Ziegler**

Sunday July 20, 2008

Session Description:

The backstage area in most any theater is an environment rife with potential hazards. The work is performed under tight schedules, involves the use of unusual structural and chemical materials, and, just to make it interesting, often done in the dark. This panel will explore the potential dangers and some solutions to consider in the planning phase.

Eddie Raymond, VP of IATSE Local 16 moderates and is joined by Monona Rossol, ACTS, Drew Landmesser, Darrell Ziegler, Associate and in-house theatre consultant for Westlake Reed Leskosky.

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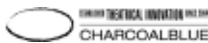
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► **Message from Bill Sapsis**

Dear Subscriber,

Thank you for your interest in the North American Theatre Engineering and Architecture Conference (NATEAC). The session you are about to read is one of the twenty that made up the inaugural conference in July of 2008.

The idea for the conference grew out of the very real need to improve communication between everyone involved in the design and construction of performance spaces in North America. NATEAC was modeled after two similar conferences produced by Richard Brett in London in 2002 and 2006. Over 250 industry professionals attended NATEAC, which was held at Pace University in the financial district of New York City.

The NATEAC mission statement reads, in part, *“to promote communication between the architects, engineers, consultants, and manufacturers responsible for designing and building new theaters and renovating existing facilities in North America. It is also our goal to promote a higher level of interaction between these professionals and the end users of their facilities.”* By all accounts NATEAC achieved its mission in excellent form. Not only were the panels well presented and received but the social events also provided an excellent opportunity to continue the discussions in a less formal setting.

The transcripts have been lightly edited to remove some of the blemishes that occur in situations like this from time to time. We have however, maintained the intent of the each speaker so that you have a clear understanding of what each session was about.

Thanks again. I hope you enjoy this transcript and that the information it provides is useful for you.

Best regards,
Bill Sapsis
NATEAC Director

EDDIE RAYMOND: Good afternoon. My name is Eddie Raymond. I'm your moderator for today's panel on Building Safer Work Spaces. The safety of technicians and performers on the stage has been a passion of mine for most of my 33 years in the business as a technician, as a middle management person, as a union rep. I say "most of " because, like most of us who grew up in this industry, I had to learn and be taught, and learn by mistakes where the hazards were, how not to get hurt, and how not to get sick with the stuff I was working with. Thirty-three years ago, we did a lot of really stupid things. I'm happy to say that in that time I've seen an exponential rise in the awareness of safety in the performance spaces and particularly in theater and film. I'm really thrilled to say that. However, there's still a long way to go.

After the Loma Prieta earthquake in San Francisco in 1989, I had the unique opportunity to be the employer representative on the rebuilding of the Geary Theater, which was completed in 1996. We had a lot of fundraising to do and kept producing theater the entire time as well. But, as a person who was intimate with the programming of the theater and how the theater was going to be used, I felt that I was in a unique position to look out for things for our crews that were going to be coming in later.

Imagine my chagrin when we opened the theater and the first crew came in, we were hanging lights on the balcony rail, and there was no fall protection on the balcony rail. There was no fall protection on the box columns. There was no fall protection in the canopy over the front of the stage, which had removable panels so that we could hang lights and do sound clusters and things. You would have thought that we would have thought of that now, huh, wouldn't ya.

It's not such a big deal to put in a 5,000-pound anchor point when you're building a building. However, after the fact, it's really difficult and expensive. In the meantime, people were exposed to risks they should not have been exposed to. That sort of opened my eyes as to where in the process this kind of a thing should happen.

The planning and the execution of the spaces that we as theater technicians work in, need to be considered not just for their functionality in terms of pragmatic things, but also their functionality in terms of the safety of the people who use those spaces. I think that when a building is put together with those sensitivities in place it does two things. First of all, it reduces the risk to the people who work there. Secondly, it informs the people who work in that building that safety is a concern of the owners of that building, and the other users of that building. It changes the way you approach your work on a daily basis.

As I once said early on in the ETCP Certification Program, I think what is happening in our industry, and what needs to continue to happen, is a systemic and a cultural change in the way we approach our work. We need to think about it differently, we need to execute it differently, and we need to start thinking about it way earlier in the process rather than when you're hanging over the balcony trying to change the lens on a 26-degree source four.

So, to that end, we've gathered a panel of three compelling speakers here. To my immediate left is Monona Rossol. She's a chemist, an artist and an industrial hygienist. She comes from a vaudeville family and had her first ADVA union card at the age of three. How many of you can say that?

She worked as a professional entertainer until she was 17 and she entered the university. She holds multiple degrees from the University of Wisconsin, including a Bachelor in Science in Chemistry with a minor in Math, a Masters of Science majoring in Ceramics and Sculpture, and a Masters of Fine

Arts with majors in Ceramics and Glass Blowing and a minor in Music. And, you know, she probably played left field for the college team as well.

While at school, she worked as a chemist and taught and exhibited artwork, performed in university music theater and opera groups and worked yearly in summer stock. Monona worked seven years a research chemist for the University of Wisconsin and a year with an industrial research laboratory. From '77 to '87, she practiced industrial hygiene at the Center for Safety in the Arts in New York, a group that she co-founded in 1977. She founded ACTS, Arts, Crafts and Theater Safety, and continues this work up till the present. She's been a full, professional member of the American Industrial Hygiene Association since 1984. Since 1995, she's been the safety director of Local 829 IATSE, United Scenic Artists, and of the IATSE itself. She lectures and consults with U.S., Canada, Australia, England and Mexico, writes a monthly newsletter for ACTS and has written seven books, one of which won the Choice Outstanding Academic Book Award from the Association of College and Research Libraries for her book, *Artists Complete Health and Safety Guide*.

She's recently been retained to testify as an expert by the U.S. Department of Labor in a trial involving a ballet company, more of which I'm sure you'll hear about soon.

To her left is Drew Landmesser. He's been a fixture behind the scenes of major American opera houses for more than 30 years. He's currently the production director of the San Francisco Opera and was previously at the Lyric Opera of Chicago and the Houston Grand Opera. He recently managed and designed the construction of San Francisco's Operas high-definition video production suite, which includes eight robotic and four manned cameras, and video and audio post-production facilities.

While in Chicago, he oversaw a three-year \$100 million renovation of the Civic Opera House and planned and supervised the completion of the Lyric Opera's 99 computer controlled breathing system. In Houston, he represented the opera in the construction of the new Wortham Theater. He's been responsible for more than 200 opera productions supervising stage directors and designers, set prop, costume, construction, stage management, wigs and makeup.

And to his left, is Darrell Ziegler, an associate and in-house theater consultant for Westlake Reed Leskosky, a theater consulting company. For more than 20 years, he's led the performance technical system design and specification efforts for more than 175 historic theater and performing arts projects located across the United States. These projects range from performing arts high schools to Broadway theaters to the Kennedy Center for the Performing Arts.

The original technical director of the Joyce Theater in New York City, he was also a Broadway stage manager. He's a member of the American Society of Theatre Consultants, the USITT, the USITT Desert States Regional Section, the League of Historic American Theatres and the Theatre Historical Society and Actors' Equity Association.

So, if you'd join me in welcoming the panel. Thank you. *[APPLAUSE]*

So, each of our panelists has a presentation of about 15 to 20 minutes and then we're going to open it up for questions at the end. If after a panelist is done you have a compelling question about that panelist's presentation, please ask them, but we're going to try to keep the questions to the end of session. So, Monona.

MONONA ROSSOL: Well, I come bearing gifts. I'm going to be talking about a number of issues. One of them is this business of green theaters, green products, green building and a lot of that is garbage. If you're a chemist, you know that they are really shoveling it. So, I have a handout here that literally talks about some of the ways they do that, some of the things that are safe and not. You're welcome to it. It has to do with the products that we use. People using citrus oils, for example,

not realizing it's an EPA registered pesticide and far more toxic than it needs to be for the job and a number of things like that.

So, when I see a theater and it's going to be a LEED project, I know right away I'm going to have to step in, looking at material safety data sheets on materials that people are using and so on, because a lot of that is hype. Not safer, in fact, some of it is more hazardous.

The other thing that I come with, I talked to a lot of people about pit nets and by gosh I found a company that usually works only with industry, but has done three pit nets for theater. These meet the OSHA standards and they get us around a lot of problems because we can't have leading edges of stages standing out in the open any more. I've got news for you it's over. Don't even go there. It's not going to happen.

In 1997, OSHA, in a letter of interpretation, said that it wouldn't be appropriate to put a rail at the front lip of the stage, but that all the fall protection rules apply. Now how does that figure? Well, because their rule says, "A standard rail or equivalent." You have to have something else that is equivalent to a standard rail, in your opinion, and you need a program. Especially if you rent your theater or if you, you know, children can be on stage, or if public gets up on stage, you cannot have that fall hazard. You've got to think about it.

So we usually plan theaters with temporary rails or with nets or with something so that there isn't going to be that kind of problem. The case that I'll be testifying in for the U.S. Department of Labor, will be the recent accident at the Fox Theater in Atlanta.

I also testified in a case a few blocks away at the Atlantic Civic Center. I'm going to show you some pictures of that situation. But, in this case, a young lady was dancing in the Nutcracker with a panda head on, couldn't see, went off the edge of the pit 12 feet. She had emergency spinal surgery and she's in pretty bad shape.

Now, can OSHA protect her? She's a high school student not a worker. No, nothing to do with that. But, she demonstrated they had no fall protection for that hazard and that's an OSHA violation so they cited them. So, things are changing. We're going to be doing some interesting types of fall protection. There's some L wire situation, there's a lot of things you can do, and you have to have a program.

I'm going to talk also about special effects and what you do about ventilation for that. Because if you're planning a theater, you can't just think about oh, there's going to be someone standing here, they're going to be enveloped in fog or there's going to be pyrotechnics or something on stage. So, let me see if I can make this go forward. Yep, all set. See, how look how smart I was.

EDDIE RAYMOND: Don't try this at home she's a theater professional.

MONONA ROSSOL: What you're looking at there is where the problem starts. That is a class in the university on lighting. There are six students and a professor there and that's where the problems start. They don't realize you can't do that; that there are limits. I also am an observer on the ESTA Standards and the fog should be used in conjunction with those standards. There are limits to what people should be breathing because even the manufacturers now know that in high concentration this can cause problems.

Also, in this city, Local 802 won't deal with it, the Musicians Union, they will not. One of the reasons is when Beauty and the Beast opened on Broadway, there were 25 musicians with a run of the play contract. Two of them occasionally took asthma medication. Within three years of that show's running, there were seven daily medicated asthmatics in that 25. So they do not care that the fog

people tell you that asthma is not related. (And) Most of the fog people are using the NIOSH standard that said they found no relationship between asthma and the fog and they pulled that whole line.

Read the whole standard. NIOSH said that because they said their sample was too small. That's why they found no relationship because they didn't have enough people to study. What we're seeing — and I have done expert witness in several cases, where people have either gotten workers' comp or settlements for asthma related to fog exposure. So, we have to think about the special effects.

This is the first theater that went black, went dark, over a fog issue. This was in 1987. This is Her Majesty's Theater in Melbourne, Australia. So, this is a worldwide problem. Don't let people tell you nobody is complaining. They're complaining all over the world. The other thing they do know, in our business, if you complain you're called unemployed. So you may not hear the complaints, but the unions do because that's where they aired it.

This is the lip of the Palace where the Beauty and the Beast opened originally and everything, of course, went right down into the pit. All the fog, all the pyro, everything, went down into the pit.

So, this is what's called an air curtain type of system that keeps the fog from coming into the pit; it blows it back up. It was supposed to be developed also with positive pressure air in the pit so that things can't get down there. When you're redesigning theaters now, and you're redesigning the ventilation, you want positive air pressure so that stuff can't get down there. This air curtain worked fairly well. You see that it blows the stuff back up onto the stage. That one is now dismantled.

Here's the Phantom of the Opera.

MALE SPEAKER: Question.

MONONA ROSSOL: Yes.

MALE SPEAKER: How much positive pressure do you need? An over pressure of 10%, 50%, 100%?

MONONA ROSSOL: You don't need much. Ten percent probably would do it, especially with an air curtain. Or one of the other people that I talked to has what he calls an extraction system where the fog comes over the edge of the stage at Spamalot and then gets drawn away. You need to do something.

There you can see the chandelier, you can see the lights on the music stands and then you see a black bar in between and that is the lip of the stage. If you're standing on the stage it's a box and that's where the air curtain is that drives the stuff up.

On either side of the stage, there's the ductwork that goes down. It goes down into a joint main — each one has a blast gauge so you can regulate and balance the system. They come together in the central main. There's a muffler so that none of the noise from the fan is being transmitted and then there's the fan. If you look around underneath there you probably figure that the Phantom could be living there, there's so much trash and garbage around there. Now, of course, the smoke goes back up and doesn't go down into the pit. But, you need to think of something if you're dealing with special effects.

In some cases, some unions want the stage to be able to be cleared within five minutes. People who protect the performers want, when you put that curtain down, that the air can be completely exchanged. That's very difficult to do, but you may want to be thinking about how you would accomplish something like that.

I was at the O Theater inspecting. The only theater, by the way, I have ever seen that is essentially 100% OSHA compliant, and not because it was designed that way, but because Cirque has a lot of money. They got up there with their welders and they took all of those catwalk rails down to 42, put in a mid-rail and a toe board, they just redid that theater. There is no place you step off into air anywhere; you're safe there. You can get 5,000-pound anchorage anywhere, over the wings, over the stage, over the audience. There's no place you can't get it. It's beautiful.

But, when I was watching the show — and I was paid to watch it more or less — I see this huge massive amount of fog and actors coming down with propane torches, I thought oh, we're going to have such a boom. But what it was, is this type of system that is made of water, potable water coming right out of the pipes. I don't know if you know the ESTA standard may be changing. Potable water is not enough if your potable also contains the legionella bacteria and many water supplies, municipal water supplies, contain it. So, you may have to do purification of water and so on.

This system is on a door-like thing, high-pressured little nozzles, makes a beautiful fall and it swings out of the way when you don't need it. So, if you've got enough money all of these problems go away.

This is a brand new theater that will remain nameless, because I just wrote an 80-page report on it. This is the balcony and the rail is 27 inches, except on the sides where it's 25. The NFPA 101 standard for rails that have sight-line problems is 26 inches. So, it doesn't quite meet that on the sides. This is unfortunately in California where the Cal/OSHA standard is very clear about balconies with sight rail problems, got to be 34 inches with a perpendicular fall catch. So, there is a real problem.

This theater is brand new and not in compliance at all. There was no fall protection planned. There's your light pole. They had to put a 5,000-pound anchorage track behind there at their own expense in order to change lights and do what they had to do.

When you sit in the seats, between the floor and the balcony rail there's a two inch gap. So you can drop your cell phone, your keys, whatever down on the people below. I don't know what the architects were thinking of, but there is a huge, huge fall problem there.

Here's the balconies and there's little sconce lights all around, very cute, no way to change them. You'd have to be hanging over, somebody holding your damn feet. There's just no way to do this and there are some lights way up on top. Some of those are 63 feet above the chairs, there's just no way to get at them at all. They're too heavy to do with grippers and things. So, I have no idea how — I think we should sign contracts with architects and say that the architects will be responsible for changing the lights for the first two years. Maybe it will fix this kind of problem.

Up in the grid, all of these things were not protected like that. That's the tech people getting rated expanded metal in order to protect it. You could drop 82 feet through those slots all over the attic area of that theater. Nobody even thought about it. I'm only giving you just a few of the things. It was just outrageous. I cannot tell you the number of times in that theater you could suddenly find yourself looking at a two-story fall; just over and over and over. What are they thinking? And of course none of the straight ladders were caged.

This one, it's a different theater, but isn't that -- *[LAUGHTER]* . I would throw that in to show you that some people really put people at risk.

We'll talk a little bit about nets. This one is at the Santa Fe Opera around their pit and of course, they have a very good program. When somebody dies at the theater, they get a very good program.

Most of the good — if I wanted to send my kid to intern I'd send them to Santa Fe because they really do a good job with safety. You were at the Houston Grand where they killed *[INAUDIBLE]*.

MALE SPEAKER: It was 20 years after I left.

MONONA ROSSOL: Okay. No, it was in 2001. Where were you in 2001?

MALE SPEAKER: I was doing standup in 2001. I was in the Foyers. Fourteen years after I left.

MONONA ROSSOL: Oh, okay. Because if he was working for them I was really going to go after him.

MALE SPEAKER: That year I was in Chicago.

MONONA ROSSOL: That's right. I was in Chicago. The Houston Grand, they had this kind of a pit net, which of course was a little un-rated *[INAUDIBLE]*, It might stop something from hitting some orchestra person on the head, but it wouldn't stop a person.

This is the net they have that the Chicago Lyric, which they did themselves and it's made of cargo net and I think it probably will hold. Then you are self-insuring when you're doing that. You really would want to have a company come in who's going to meet the OSHA standards and do this right. Because if you use a cargo net and it's not really for cargo, you'd be better to get a company that is in to fall protection netting and meets the OSHA standards; but it looks good.

This is the Atlanta Civic Center. This is where there was a theater accident. Well, it's hard to see. But it's a nice little theater and there's a pit down in front. Here's the lip of the stage and the floor of the pit and in the black area there is black cloth. The problem is there could be something behind that black cloth or there can be nothing behind that black cloth. What they had was a — yeah, you can barely see this — it looks like chicken wire. It looks like these fences, these chain link fences, and you would connect this to the floor of the pit so that people wouldn't just step off the back, through the cloth and down 20 feet. Well, a little nine-year-old went to see his father in the orchestra and they were striking so he went to the edge of the stage and was looking up and watching and all of a sudden he wasn't there. He went 20 feet down into the hydraulic pit and after two years in a coma, he finally died.

Of course the bills were way over the \$1 million cap that the City of Atlanta had. So, we not only sued the City of Atlanta and got the biggest settlement ever against that city, which was more than a million, but we sued people who even used that theater and saw that defect and did nothing. So, we collected enough money to get that family back on their feet because they had gone through everything. They lost their home. They had lost absolutely everything. This is the hydraulic pit where he had his fatal accident.

A word about maintenance. *[LAUGHTER]* None of these things, of course, will continue to function if you don't know how to maintain them as well.

Okay. So, those are the main things I have to say on fall protection and ladders, but I have one other quick thing to say having to do with when you plan to have shops in your theater as well. If you're going to have a costume shop, a prop shop, a little scene area, somewhere for touchup or something, or a regular full blown scene shop. If you're planning a theater like that and all of your engineers are -- your ventilation engineers are heating and air conditioning engineers, you're going down. You're dead. You have got to have a consulting industrial ventilation engineer. HVAC engineers who move very large amounts of air very slowly through square ducts. Industrial ventilation engineers move much smaller amounts of air very rapidly through round ducts. Now, you would think they had something in common. I'm here to tell you they can't even talk to each other. You have

to have the right kind of engineer if you are doing any kind of shop where you need local exhaust ventilation because the HVAC people are not equipped to do it. It is a separate standard, separate local, separate everything.

So, those are my main points and I hope we have some questions after that. Yes.

MALE SPEAKER: I just have a quick question. On the cargo netting — excuse me, not cargo netting, the fall netting in the orchestra pit, is there a testing protocol for that?

MONONA ROSSOL: That's the problem. They've done that by the seat of their pants.

MALE SPEAKER: No, I mean, is there a testing protocol for any of them?

MONONA ROSSOL: Yes. Oh, yes. That's why I gave these handouts. They talk about the drop test because these people do it for industry and so they would perform the same kinds of drop tests for your theater.

EDDIE RAYMOND: Just a note. We are recording this session so if you have a question, please state your name and who you are with for the record. Thank you.

Okay. Good. Drew Landmesser from the San Francisco Opera is next.

DREW LANDMESSER: As Monona mentioned, I've traveled around a little bit. I've traveled slowly. For those of you who were in the architects meetings that we had as part of this, I was the one they made shut up when they planning the Wortham Theater in Houston.

MALE SPEAKER: I was there.

DREW LANDMESSER: Yeah. A little bit of insight. They made us stop making contact because the owners were adding too much valuable input so they just made us stop. I left as soon as that building opened in 1987 and went to the Lyric where my experiences were very much different. I stayed there for 20 years and two years ago, I left for San Francisco.

I thought that was interesting. What was interesting about my scores of travels and ended up in Houston, I never met anybody who was concerned about safety. I met the fire marshall for the very first time the day he came to plead if I could help him, on the QT, explain what a fire curtain was because he was supposed to okay the ones for the Wortham Theater, he didn't know what they were.

Sadly then, we went over — my carpenter and I — we went over and cut the trip line on the curtain at the Jones' Hall and the fire curtain proceeded to go out. At least it was a good place to be and then to not be.

When I left Houston I went to San Francisco and there I found that we had amongst our 38,000 subscribers the head of the fire department. He loved us. He liked coming to the theater. He didn't come backstage very much; he left that for fire prevention. But on the weekend that there was a fire in Connecticut and several dozen people died, That same weekend there was a kind of panic in a nightclub in South Chicago where many people died, that weekend on his way home from work, he was on his way to the train, he walked by the Opera House to find that in preparation for the — that night the theater was closed, but in preparation for the party the next night, development had stuffed the exit doorways more than a head high with glassware to be used at the party the next night.

He became our friend who sent somebody from the fire department about five days a week for the next three years, which was good. We became very good friends and we did a lot of good work together.

Monona, as we talked about, Monona and I have gone back to the '90s when we started a safety program in Chicago. That safety program in Chicago wasn't started by an OSHA violation or the fire

department or an injury, it was started because a friend in Houston died in an accident and it caused me to think that who are the police. The police are not the fire department, they're not Cal/OSHA, they're us. We're our only police. We are our own first and best vanguards.

We started that program from scratch with the local hospital as the program became kind of a model program. I hope it's still continuing. We're trying to start something now. Eddie and Local 16 in San Francisco, we're doing a lot of training and we have a lot of work to do in San Francisco, as you'll see.

I rebelled against PowerPoint and I'm too boring to listen to without having some accompanying visual aid. So, I'm going to play the movie in the background. Some of these things you'll maybe recognize as why people go to opera or why people think they go to opera. Then you'll see a little bit about what we do for a living, and then you'll see my version of the Blair Witch kind of backstage.

You'll see a ladder or two by Monona, which I thought was pretty cute. So, let's hope this works.
[PLAYING MOVIE]

So, we're in War Memorial Opera House. It's a city-owned building, a complex of performing arts venues. It's a great building built in the 1930s; great performances, terrific artists, an excellent reputation. We do 75 performances on the main stage. We do work in communities of upwards — these are actually clips from movies that we made. Cybercasts that we made that we put around America, Australia and England. Nobody marketed it so nobody came to see it.

Nonetheless, people come to the opera because they want this grand and glorious experience, voices and a spectacular night that they can't get any place else. What that means though is you get flying people, you get fire effects, you get smoke, you get all this stuff that we don't do and we don't think about.

The San Francisco Opera is at a little bit of a crossroads. We had a history of a bad, bad relationship with Cal/OSHA. Cal/OSHA would come to visit us a lot because we had some choristers who really didn't appreciate what was being done to them and I don't blame them. We now have a pretty good relationship with Cal/OSHA. We have a couple of citations that you'll see a little bit more about it there about the War Memorial Opera House. Whenever Cal/OSHA comes to the War Memorial Opera House they come to visit me. The ballet can be in the hall and they come to visit me.

This is the Samson scene change. It's sped up a little bit, but you get to see the scale of what goes on in a four-hour changeover. This is a room with a 30-foot disc of fire that you will see in a couple of seconds. This whole thing comes apart and goes together. There's a different shot on a four-hour change. This happens on a daily basis sometimes twice a day. It's what any big repertoire opera house has to deal with, but we have to deal with safely.

You can see a lot of guys — maybe not so many, but a lot of guys are wearing hardhats. Hardhats are the norm on stage when someone is working more than six feet over their head. That used to be the case. My predecessor, Patrick Margo, started that and it's well received in the War Memorial Opera House when the opera is in existence.

When the ballet comes, they don't use hardhats. They don't use fall protection. They don't use a lot of things. If there's anybody from the ballet here, ballet world here, apparently your stuff doesn't hurt when it hits you in the head; my stuff does. So, we will wear hardhats the time I'm there.

You'll also see personnel lifts a number of different sizes, all with their outriggers. You'll see men wearing tool belts, you'll see men prepared and safely trained. This is not always something that you get to see.

I think our biggest change with Cal/OSHA has not been the change with Cal/OSHA necessarily, but change with the people and their relationships. It's no longer a hostile relationship. We talk a lot and we have safety meetings. We have asides, we have meetings in the hallway, but mostly we just talk a lot. For some reason I think it's a lot easier.

This is the collapse of the temple at the end of Sampson when the whole thing comes down. We're just checking it. We're doing light cues. And there's a pit with no fall protection. For some reason the chorus used to like to call Cal/OSHA because it was so much easier than taking seven steps to the left and talking to a stage manager what the problem was. I think the reason was is that when they told the stage managers nothing happened.

They called Cal/OSHA and something happened, but it wasn't always necessary a good thing for the company. When I got there, there were 16-4 open grievances against the opera company by the Chorus Union and today there are none. I will do my best to see that there are never any about safety.

You guys who work in the pit you will probably notice, I mean, this stuff is going on behind the curtain. There are thousands of different departments. Not really, there are five or six different departments all doing work simultaneously, and they pretty much know where they're going. The same guys are doing it mostly every day. They get two days off a week. They are well rested, they're well paid, they're well taken care of, but they also care a great deal. This is a great local with a great tradition and I think they're among America's best stagehands. Local 1 is also great. Local 2 in Chicago they're good, but I think these guys are better. Sorry, Chicago.

As we finish up with this, we'll start the Blair Witch part of the night. A number of the things that we're looking at are things that there are some Cal/OSHA citations that are currently open. They just, a week or so ago, threw out five of the six that are directed to the opera. There is one that is still directed to the opera house.

In the mid '90s, a \$100 million renovation took place at the opera house, mostly because of the seismic problems from the earthquake in the '80s. The opera and the ballet were shut out of the building for about two years and they came back with provisions that were done by the city and state and the federal government about the earthquake and about \$100 million that were paid by the ballet and opera money, funds raised privately and contributed as improvements. A lot of those things now are things that we're trying to do — that are now 10, 12 years old and we're trying to slowly, over the next couple of years, replace some of the systems, lighting, sound and the rest of it.

Our head alert system, not only is there one, but we use it. That turns on flashing lights. It doesn't unfortunately turn on a laser to burn anybody when they cross the line. I remember one day all of our guys wearing hard hats, they were working up on the grid, we were striking the last show of the year, last show of the summer season. There were probably 15 guys on the grid, there were probably half a dozen guys wandering around on the stage at the War Memorial, this not-for-profit entity — I'm going to pause this for a second — had 36 people out on stage for a tour. This is looking down at the basement level. The traps are being opened because we're getting rid of the plugs and putting in the real trap plates. They're working up on the grid. We're all wearing hard hats. Most of us are off in the corners and (whistles), you know, they're undivided, they happened to receive notification and they just show up.

But, I think the point is you can't be everywhere at all times. I'm not sure who would have yelled at them first except three or four of us showed up simultaneously, but building owners aren't necessarily the people that are going to take care of your problems.

Where I stopped this, this is a particularly interesting area. This strange looking ladder on the right side of the screen has a fall arrest on it. You can see some hooks on it on the track in the center of it. The ballet and the opera share the building. As I said, we're probably booked 50 of the 52 weeks of the year. This leads to a rear projection bridge that when in storage is about 35 feet in the air. It's a straight ladder with no other fall protection. This is not 1932. This was installed in the early '80s by the lighting guys in San Francisco for a rear projection bridge.

The bridge, when it's used, is probably in the range of 16 to 18 feet so that's it mid-span on the RP screen. But to get to it, and to shuffle things around, you have to climb the ladder all the way.

We received a citation during the ballet season because the ballet took this down because it was in their way. Cal/OSHA came, because someone called them, and said it was down. So they wrote us up a bunch of citations. They were all thrown out — except for this one that we'll get to in a couple of seconds — because we weren't in the building. None of our employees were at risk. It's really a technicality. Somebody is at risk when this is down. It's difficult. They're the same stagehands and in the same unions. You know who I'm talking about.

MONONA ROSSOL: I do.

DREW LANDMESSER: It's hard. We're talking about a culture.

EDDIE RAYMOND: As Dorothy Parker said, "You can lead a horticulture but you can't make her think."

DREW LANDMESSER: This isn't Dorothy. This is not her problem.

So, you go up this ladder, you go about 35 feet up the ladder — and I apologize, I'm the camera-man here — and there's a gate. But how do you get through the gate? Yeah, you take whatever fall protection you have off, you swing yourself over through the gate, and then you're above this platform. It's 110-foot fall if you fall.

The citation that still exists is this. This is a catwalk leaning out to the lighting bridge when the bridge is up or near trim and, as you can see, there's a gate at the end. There's a ladder, but there's a gate there. The gate we modified that so it swings inboard. It used to swing outboard. If the bridge is not at trim, you can fall a chunk. The gate is still not my favorite, but Cal/OSHA seems content with it. We have more work to do with it in my mind.

Cal/OSHA, we have informal discussions with them now. They are the more militant branch of OSHA. For those of you who don't know, they're like Hitler's special army, they're the ones that protect him. They're far more aggressive. Still, I find that this is a scary situation to walk out there when the bridge is down. Right now the bridge is down because we shutdown thanks to them — his is a lovely photograph of the clock before. We shutdown for two weeks every year when the ballet and the opera share the maintenance of the War Memorial. It's a city owned building. The city does this much maintenance on it and we each do all the maintenance on it, but at least we know the building is in good shape.

This is a ladder to nowhere, from nowhere, dropping 40 feet. It's leftover from before the renovation. It has not come off yet. Why it wasn't demoed, I don't know, but there are several of these. It's one of my favorite pictures because Cal/OSHA, as we go out there and looked at this bridge and this railing, we put up this *[INAUDIBLE]* and announced it was for sheer protection, and that ladder is right there. The Cal/OSHA looks at it every time and doesn't say anything about it. I mean, I'm stunned, but that's one of the things on our list.

When we're doing work on these railings, we not only have 45 inch railings we also have plywood up against them so there's nothing that, you know, unless you're six inches tall and can fall over the side of them, but there's *[INAUDIBLE]* and fall protection even when we're working up there, because if we're tall and heavy we go over the sides.

This is a 1996 railing and that's where they cut off the 1930 railing that's only 36 inches high. But did they change the height of the railing, no. About a mile of this railing in this building is 36 inches and it all has to be remedied. This is the one open citation and thankfully, it's been addressed to the building owner. For the very first time they got a citation. They have managed to not respond to it for more than six months. Now they're responding to it.

Again, some of this is just kind of — I wouldn't call it an art photograph, but nonetheless. It is a clean building, it's a well-run building, we maintain it, we keep it clean, nobody else does it. As we go through these things, if you look at the floors and look at the walls there was no cleanup. It wasn't like the insurance guy was coming that week, this is just how we keep it.

This, I know, is one of Eddie's favorite things. This is the main loading bridge. It's a lot of weight. It's a 12-inch kick plate with C channel. If you think about the fact that everyday, while we were doing *[INAUDIBLE]*, there were four guys on this loading bridge and probably two guys that ran between the two loading bridges. Each of their weights are 35 pounds and they're hanging over the side, and this open chain drives from the '90s. We had plans to cage all this stuff, but you can't build a theater in a year and you can't fix a theater in a year either.

We've added a lot of gates and platforms and things at the bottoms of ladders that we actually do use. Some of those were proactive, some of those were in response to Cal/OSHA or some individual bringing them to our or someone else's attention.

I think the thing is that it needs ownership. The stagehands here own this building. They take great pride in what they do. They take great pride in the fact that they like to keep a safe workplace. Our crew- I think we have some really attentive people and I think the valley crew is coming along, so we'll get there.

This is thanks to the '90s renovation. The lighting positions in front of the house are, for the most part, all tucked in the slots. Nice catwalks, well-lit. Great big house. Really crappy aisle lights, really, really crappy stair lights. White tape on carpet is kind of your best hope if you're an audience member and you come in in the dark. That's going to take — I don't know, maybe we'll have to call the fire department during the week that the War Memorial runs the theater. I don't know how we're going to get that remedied because we don't have enough money. Where we can, we've replaced the open spans with plywood just so that we keep some things from falling through.

What we're in discussions with right now is we've been in the process, over the last two years, of replacing all of the bike craft. An old company that maybe some of you know and maybe some of you don't know, but all the bike craft rigging that in — Tom. Hi, Tom — rigging that in in the '90s. We've taken control of that with a nomad now. All the light bridges and the house curtain are now on Nomad. Last year we put in 14 spotlight machines and we're in discussion and planning — wrestling a little bit still with people who want that manual backup, but I think before the end of the year we'll have it.

We have a donor on the hook ready to complete the automated rigging into this theater, which I think, if I'm not mistaken, will be the second opera house after the Met opened in 1967.

Stage floor, perfectly flat and well maintained. We replace the floor on a regular basis. Traps are replaced anywhere and tears are replaced. It's about maintenance for us. That's what we think. We think our best defense is really getting out there and trying to get ahead of it.

I think that's about it. So, if you have any questions that's fine. Otherwise, you'll see a couple of more ladders to nowhere and we'll be out of here. Any questions? Yes.

MALE SPEAKER: What was the process that you went through to get the investment and ownership from your crew?

DREW LANDMESSER: The crew?

MALE SPEAKER: Yeah, and to get them to really love the space and to take care of it instead of just bitching about it?

DREW LANDMESSER: Monona, what did you say, you have to kill somebody, is that what you said?

MONONA ROSSOL: Yeah, that works really well.

DREW LANDMESSER: No one died in San Francisco, but I think they did have a bad accident and I think that helped them.

MALE SPEAKER: Short of that?

MONONA ROSSOL: There has to be some kind of climate that people can complain, that is the main problem. I don't care whether you're talking about people on stage complaining, the stage-hands complaining, I don't care, but there has to be communication. The biggest problem is fear of losing your job because you're bringing up a problem.

DREW LANDMESSER: I think the big change happens when you get your crews to realize that losing their job might be what happens if they don't do something a better way.

MALE SPEAKER: Right.

DREW LANDMESSER: You know, it's not hard to be compliant, it's expensive to be compliant. I used to kid the CFO in Chicago by the time we're fully complaint we'll be broke so we'll be fine.

Our answer to this RP bridge and this ladder, we're going to take it down. We don't use hung projectors any more. Hung projectors there's *[INAUDIBLE]* had a great idea, but we replaced all our *[INAUDIBLE]* with video projection. We don't need to have six guys up there changing slides. What else can you do or how else can you think about it. We don't need this ladder, we don't need that catwalk it's just causing us a problem.

Because if we let this run long enough you'll see a little bit of the Samson changeover again from a different view during a performance, during a scene change, and you'll see two electricians run up a ladder, jump across the bridge, run across the bridge and come running back down. It's about investing yourself.

In Chicago when we did the renovation, we put \$20 million — not really, we put \$18 million that we didn't spend on the hydraulic lifts, we put it into an endowment that constantly pays for the renovation, the supplies, the labor and the equipment to keep that building fresh. We are starting that now in San Francisco.

MALE SPEAKER: Fantastic.

DREW LANDMESSER: It takes money. It's a real investment.

MALE SPEAKER: It is, yeah.

DREW LANDMESSER: But if you don't invest in it, if you don't convince people that it's worth it, then you'll end up with clocks that are gaffed taped to the wall.

There it is. There's the ladder from — this one really is to nowhere from nowhere and nobody can even tell me when they used it or why they used it. I love that ladder.

EDDIE RAYMOND: Just really briefly, while he's getting his slides up, in San Francisco, to answer the question, there's a tradition in the entire Local that we do indoctrination with people as soon as they start working with us, within the first six months. We stress a lot of safety and we stress the fact that you are your own best resource in pointing out problems, in being the monitor of safety, in being good at your craft so that you do your craft well and in a safe manner. That's reinforced through the apprentice program and then through continuing education and exposure at the Local and all the employers not just the San Francisco opera. The San Francisco opera compliments that with their attitude about safety as well.

So, to answer the question, it's a cultural thing. It starts with the guys who came before me in the Local and beat it into me, literally, and it continues now hopefully in a kinder, gentler way, but it definitely gets the message across.

MALE SPEAKER: I had it beat into me at 15 in Seattle and now down in Oregon Shakespeare festival and it's trying to beat it into a new group of people.

EDDIE RAYMOND: Yeah. Get the heads of departments to buy into it. Yeah.

MONONA ROSSOL: Keep them trained. Have something every month that they're learning because otherwise it becomes stagnant and people don't really keep up with the rules and pretty soon it gets sloppy again.

MALE SPEAKER: Yeah.

DARRELL ZIEGLER: Going with that question, a little later I have something I'd like to toss out as a way to get more people to kick in and to bring up more of those points that we bring out in there.

I'm a theater consultant and both for new construction and renovations there are code requirements for certain safety designs. Things now that you have to have, fall protection and box booms, etc. Where I'm wanting to go more of today is some things to wear where we start getting the local authorities, who have jurisdiction, suggesting additional stuff happening, which, in my mind, ends up making a condition actually a little bit more dangerous than what it was previously.

And then there are some pictures I want to show that any of us who have worked in our business have run into situations like this. All of the ones I'm showing are dangerous conditions in theaters that are operating or were operating before a renovation and are also intended for any architects that may be in the room who may not get up into locations such as this. That when we're bringing up certain things that need to change or have to happen, these are evidence of why it needs to happen.

This is what I typically use in a project of mine. It's something that I came up with when I was at Sachs Morgan Studio that Steve Russ and I came up with. It has an intermediate railing to where we got the 21 inch sphere that can go in between. We have an outrigger that's cantilevered a bit so the unit can go down. It's got a kick plate. In some instances, we can make that intermediate moveable if you're putting a wiggle light in or needing to do a follow spot, etc., and that is inserted very well.

What I've run into is, this is from a project in Connecticut that the local authority didn't like the fact that in this catwalk you still had open space between the intermediate railing and the floor plate. So he required that there be these bars get added on 8 inch centers between the kick plate and the intermediate rate.

Now, one of the things that I was discussing with him is that when you have something like this and then you're wanting to put color in the unit or run a barrel or something like that, you're having to either try and reach through here or the person is reaching over that intermediate railing to try and reach out to get to the end of the barrel.

We tried to explain to him, we try to demonstrate to him, that in instances like this you may be causing the stagehand — in this instance it was a high school and you've got a student up there that you may be requiring to lean over that intermediate rail in order to get out to something. We were not successful in getting him to change his mind and so there's a performing arts high school that has this type of catwalk across it.

In Massachusetts, we ran into a similar situation where he required us to go ahead and put the upper rail at 5 feet and then he had the intermediate rail moved up to 2'9" with the bars in between. So we don't have a railing at 42. We ended up once again having problems of if someone is having to reach out to get to here, they're leaning once again farther over that intermediate railing and they can't reach up in between. We had people from the performing arts high school trying, we even had meetings with the inspector, and we were unsuccessful. This is what we were forced to do. This is what ended up being the final result. So, the fixtures get hung up here, but it ends up being quite a railing that they have to reach over in order for that to happen.

So, it's something that I bring up to people that it is something we are running into. Particularly ones where we have an inspector who is not used to how the building is being operated and all they see is a catwalk and want guard railings that someone can't fall through. There have been in some local — in some jurisdictions in both Connecticut and Massachusetts we've been successful. In others we haven't been.

So, I put this out there as something of a cautionary tale. We started getting involved very early in projects having discussions with the local authority, even when they're in the design phase, to start running this past them to show them what we're looking to do. This is opposed to something that right when we're under construction or the final drawings are going for approval that they end up making something a requirement.

Loading bridges. This is a series of slides of various types of dangerous conditions that when I've done existing condition surveys early in a project I've run into this. The thing that I do is when I see things like this I immediately take pictures and I do a report. I give that report to the architect. I give the report to the owner's representative. I give that report to the TD. What I'm looking to do is to have no one claim that they were not aware that there was a dangerous condition in that theater. Sometimes the TD is looking for someone other than themselves, somebody else that says, "hey, this is dangerous", in order to get their management or the city or whoever is running the theater to pay attention to them. I've found this to be very effective.

What I'm encouraging is that it's not just a consultant who I made — when I first took this picture, it was four years before the theater was renovated to where this ultimately was corrected. Now, if there is anyone here who tours who are in productions, whether it's with a ballet, a touring company, who run into any condition or any situation where, as part of your work in a theater you run into a situa-

tion, I'm encouraging you to do a similar type of notification as well. Whether it's the local production manager or the local TD, etc., to where you're able to give them some ammunition to bring up the fact that a situation exists. We're all running into too many places where they say, well it's been that way for 10 years and there hasn't been a problem.

If we're able to get more people bringing it to someone's attention that these are situations that we are finding we have a better chance of getting them fixed either during the time when you start to design a renovation or a new place and when it's fixed. That's where I'm concerned.

Here is another one, completely open on the — this is the stage side, I mean, it's completely open. There's just a little bit of the edge of the channel sticking up, almost at a tripping height. The one on the other side, once again, no railing on the arbor side. This is another one with no railings on either side. In this particular theater, they were very good about only one layer of weights. But the biggest reason it had only one layer of weights is they didn't have enough weight in the house to stack it any higher. But at least they did it along the whole length of it as opposed to more where it was conditioned.

Also there's no railing on the edge of the gridiron. We see that a lot also in there. That it gets into where even if you end up with a floor managed system, you end up with substantial distance between where the lines may be coming across and the edge of the gridiron that someone can fall off of into there.

This is the worst loading bridge I've ever seen.

MALE SPEAKER: Oh, wow!

MALE SPEAKER: Jesus.

DARRELL ZIEGLER: I work in a firm that is combined architectural engineering, etc., and I have started to teach both our mechanical engineers, electrical engineers, structural engineers the horrors of what some of the stuff we run into. This picture was actually taken by a structural engineer who was brought into this particular theater to look at some structural requirements for a rigging system they had before I even got here. So she took this picture and it literally was one that had no loading bridge at all.

They did a homemade rig of just two pieces of two-by that was suspended like a little trapeze at mid stage that went to another one and then there was another piece here that formed where they stacked the weight. These are stage weights, this down here they're stacked. This is the stage side, this is the arbor side and they use this theater.

That one, at least, we did — I mean, we did all kinds of raising a ruckus about this situation. They took this down and they ended up getting a bull winch to be able to bring the arbor down. They were quite proud of this and they thought it was an imaginative solution. *[LAUGHTER]* Now, it was, but it's an example of, unfortunately, what we in the past have done just to make things function. We're all guilty of that. Uncle Bill at times says there are points where we just have to start saying no when we run into situations like that. We don't do it any more and we don't allow other people to do it.

This is a head beam of this sloping head block. This one is split to the point where there's just a remnant of it. They tacked on another one because it broke here and they just scabbed another one across the top. This is in a theater that is functioning. The TD sent some people up to re-release some ropes, but he didn't go up to check it afterwards. Here, you end up having — where the rope

is running over the spacer bar and I knew there was trouble up there because on the fly floor below there was all this [INAUDIBLE]. And you go up there and you see stuff like this.

And so, these are ones to where the ropes were in awful condition even though they had been replaced fairly recently. So, they were comfortable thinking that they weren't going to have to worry about this rope for quite a while. This ended up being in extremely bad shape.

This is another one where it's a wire guide set and they had cranked down on the turnbuckles of the wire guide to the point where it had started to bend this, but also, the purchase line is running up over the spacer bar. When I came in and went up there to look at it - this is more like a civic auditorium type of situation where there weren't true stagehands that were a part of it, it was more city employees. When I went up there they said, it keeps getting harder and harder to pull, and they said, take a look at it. These are things that we're running into.

This is the front of house lighting catwalk that was added on in a place that had no front house position. They literally just cut a hole in the ceiling, they took some pipes, you see they're kind of anchored here, ran them across the edge of the stage and then added this wood catwalk. In order to focus these units they're (on there in a prone position, they're laying on their stomach and reaching down. To get to this position, they're crawling across to here where their stomachs are on top of this bar in order to get to these. So, they always tell me they focus these first because these would be too high by the time they go to do the other one. [LAUGHTER] This is one to where the catwalk railing but the sweep of the ceiling was such that if they wanted to light the floor, stage or the end of the apron, they would take units off and they would put a piece of wood in between the edge of the black iron or the plaster. In order to hang fixtures to get it to shine down deeper. Needless to say there are portions where the black iron is now to the point where it's bent and the plaster is damaged.

And here's one of my favorites. [LAUGHTER]

MALE SPEAKER: Nice.

DARRELL ZIEGLER: This is in this same civic auditorium and they needed a follow spot position. They just took some perforated angle across here, set it on top and they ran some pieces of two-by with just the spacer bar of the seat is sitting on top of it. They pointed out that they tied on some stuff here so it couldn't fall. But this was something that was used. I mean, they had somebody up there on the regular basis operating this as a follow spot position. We were able to successfully get them to disassemble this. It had however, been there for a number of years.

We've all seen these. I haven't seen too many where the load wires coming in are just two wires. There was no ground to any system in this particular place. There was a mixture of different dimmer packs. There was mixture of different connectors. Some of the conductors were plenum-rated wires. Some of them were just whatever wire they could find laying around. They were upset with me whenever I made a report stating that something was a dangerous condition. It particularly made management unhappy.

This is one where it's a combination of some hard-wiring and some dimmer packs and cables being dropped in and brought in from all over. This luckily is one that has since been changed. We got rid of all the temporary cables. This is also in a late 1800s, early 1900 theater that was wood construction everywhere. So all around us was nothing but wood.

This is a front of house that pick point consists of two-by that was lying in the ceiling with some two-inch tube. That chain here, the span set here for a speaker cluster. This is a photo for a couple of things. Not just a dangerous pick point, but there's all this pigeon guano all around. Just above this is a

vent that they open, depending upon what the weather is doing. They open this and the pigeon — it just dumps it down into this area.

Now, the other significance, which Monona appreciated, is that this is in the attic above the theater — in the ceiling of the theater is plaster grating. This is used as a *[INAUDIBLE]*. And so, all of the stuff, the pigeon feathers, the pigeon guano, all the mites, all the bacteria, etc., is introduced from the attic into the auditorium. We've run into places where the filters for the air conditioning have been up in attics and have been coated, just coated, with basically pigeon shit and feathers and they had no problem with it whatsoever.

We run into this quite often. Older theaters where they came in and took out original chairs and put in some seats that were donated from someplace else. The length of chairs for the rows didn't make it. They painted this edge(*,) They didn't do anything right there, and it was all over the place in there. They had no aisle lights whatsoever in this balcony. There was no illumination at all. All they had was this similar white strip.

Quite often we run into places where in older theaters, right, you've got the gutters clogged and they end up backing the water up and they start getting leaky problems. They send the local stagehand or the TD to clean out the gutters, but there's no fall protection for him up there. He's gone up to do this when that has been ice because of it being to where he's tried to chip out stuff to get into the gutter.

The management wasn't even aware that that was something he was doing. So, this is something to where we need to encourage technical directors and technical staff to make sure to go ahead and stand up and say, this is what's going on. Very few now of management are not paying attention when it's brought up to them, particularly from somebody from the outside, because of the amount of liability that's coming on now. So, there's less and less of the lose your job if you bring it up because more people are becoming much more cognizant of it.

But, once again, I'm encouraging that anyone who is in another position, whether it's as a consultant, as another management person visiting, as a touring stagehand, etc., anything you can do to bring out the problems in those theaters will be help to them.

And this last one has nothing to do with safety, but I just like this *[LAUGHTER]* because they complained that the air conditioning wasn't working in auditorium and this whole run of ductwork had a catwalk hanging from it. So, that's the end of my talk. *[APPLAUSE]*

EDDIE RAYMOND: Wow! I'm glad I don't work there. I'm going to open it up for questions.

MONONA ROSSOL: Well, one thing I was thinking of is that there has to be more responsibility from the architects. They can't leave a building in this condition. Somebody has to take a step that says — the building has to work. It has to be a building that is OSHA complaint for the workers. If it's not, I think the onus has to go back to the architect, especially in these new buildings that I'm seeing and writing some reports on.

We did the same thing in the arts field back a number of years ago. We took a very large sum away from a very famous architect who built an art school with natural ventilation. Windows that opened and skylights for welding and ceramic and kiln firing, acid etching and so on, and of course, that doesn't meet standards.

This is maybe something that has to happen because I know what architects learn in school and it isn't this. They rely on their engineers, but they don't know enough to know when their engineers

are leaving them with problems. I'm very interested in finding ways that it can go back to the architect. Yes.

RICHARD BRETT: Richard Brett, *[INAUDIBLE]* in the U.K. I mean, in Europe the architect would be held responsible.

MONONA ROSSOL: Yes. Well, we have to take —

RICHARD BRETT: It surprises me that here in the U.S. that the architect is not responsible and the building is actually taken over with some of the faults that you see.

MONONA ROSSOL: I agree.

RICHARD BRETT: They would be sued straight away. I'm just fascinated *[INAUDIBLE]*.

MALE SPEAKER: Excuse me. Who's holding the architect responsible? Who's making the architect go back and fix that?

RICHARD BRETT: Well, the client.

MONONA ROSSOL: The client.

MALE SPEAKER: The client. Okay.

RICHARD BRETT: I would think the theater consultant would be somebody. I mean, some of the things we've seen, the lighting rail, which you cannot reach lights from and work safety, would just not be allowed. There could be arguments if the theater is at fault.

MALE SPEAKER: I'm agreeing with you.

RICHARD BRETT: But it is just a fact that we had a previous session this afternoon about owners/representatives, architects responsibilities. Well, this is it, the architects and the consultants, the people who are the professionals, have got to learn to do that job properly and it isn't a question of any excuses.

DARRELL ZIEGLER: Unfortunately, there are projects that don't have a theater consultant as part of them. And so it is —

RICHARD BRETT: Well, try to put the word about that you have to have professional, experienced people otherwise you get these sorts of disasters.

MONONA ROSSOL: Well, there were theater consultants on that theater that I showed you. I don't know who they were, but they were consultants.

RICHARD BRETT: ASTC, I would hope that some action is going to be taken because *[INAUDIBLE]*.

DREW LANDMESSER: The theater I work in is owned by the city and county of San Francisco and the architect of record for the renovation that left all those handrails untouched and those ladders as they were, is the Bureau of Architecture for the city and county of San Francisco. So, who polices them?

RICHARD BRETT: Now, that makes it a little bit more difficult.

DREW LANDMESSER: So, it goes back to the user.

MALE SPEAKER: The city has to sue itself in that case.

MONONA ROSSOL: It could happen.

RICHARD BRETT: Could not a worker take action against the city? I'm at risk, I've been asked to work at this theater. Okay. He probably would quit his job but —

MONONA ROSSOL: Well, a worker can't because there's this weird thing here that all you can get for your accident is workers' comp. But, if you bring in a volunteer who is not technically an employee, that person can sue. It's a very strange gray area, but we very often — many of the lawsuits that I'm involved in a lot of strategy has to be worked out first and who to sue and how to get it to happen.

RICHARD BRETT: Just fine. Sorry, Eddie. For example, I had *[INAUDIBLE]* is wrong and it should be corrected. But I'm less worried about that than I am about some of the extraordinary things, gates swinging the wrong way. Every gate we do in Europe is interlocked. If the thing isn't there to connect to it that gate will not open. So, it seems to me that there are just one or two little things that need to be (over talk).

DREW LANDMESSER: Our OSHA observer has that gate now as it swings off stage instead of where the bridge would be. He's okay with that, but I'm not he is.

RICHARD BRETT: It can be opened when there is nothing there.

DREW LANDMESSER: Exactly, that's why I went up there.

RICHARD BRETT: Well, I'm sorry, that is not acceptable. That is not acceptable.

DREW LANDMESSER: He's okay with that and I'm not. So, I think what I keep saying is it's us, we have to take care of it.

EDDIE RAYMOND: Well, I think one of the things Richard was saying this morning, and it goes back to, you know, our main goal is to design better buildings and build better buildings as we go forward as well as retrofit buildings that have problems. It was in your address this morning that having experienced people doing it.

One of the things that came up in another session just after that was that a lot of architects and engineers do all kinds of buildings and they may never have done theaters before or the team of people may not have done theaters before.

When we were doing the Geary for the first time and the theater projects brought in their drawing of a head block system and a catwalk system for a loading bridge, and they had these giant pieces of iron there. The engineers went, "Why would ever build a catwalk with 12" eye beams." I said, "Have you ever been on a loading bridge?" And he said, "Well, no." "Let's go to the Opera House then."

That kind of education of the team, by somebody, whether it's the architect educating the engineer or the theater consultant educating the architect, or the end client educating the team about traditions and uses of the space, as well as their own programming, I think is really essential. And having a willingness by the rest of the team to listen to that not just, you know — we all want a pretty building, we want a good, functional building, but this is how I'm going to use the balcony railing. I need fall protection on the balcony railing and one of you guys has to engineer me a 5,000 point anchor point often enough that I can tie off and not fall off and break my neck.

And that's, I think, a conversation that doesn't happen often enough and I think it's a communication between theater consultants, architects, engineers and everyone else involved in the building, but doesn't happen often enough.

RICHARD BRETT: And also, of course, the people who are not here.

EDDIE RAYMOND: Yes.

RICHARD BRETT: The architects and the theater consultants who are not professional that are just getting on with it.

EDDIE RAYMOND: True.

RICHARD BRETT: We've got to get them in somehow.

EDDIE RAYMOND: Have to start somewhere. Yes. Sorry.

ROBERT HAMILTON: One of the frustrations of — Robert Hamilton, Theater Consultant, Douglas Welch Design, Canada. One of the frustrations I've seen in designing catwalks, like you mentioned at the beginning for lighting, and railings and certain seating areas for safety, one of the problems I've seen in both of those conditions is there is no code that says the light — which is the reason you're building the catwalk to begin with — has to fit between the railings or somehow. There is no code that says it has to fit or shine at the thing you're wanting to shine it at. So, you could build a vertically, safe, code compliant catwalk that's absolutely useless for what you want to use it for.

And the same with railings, there's no code that says you have to be able to see the stage from your seat. You know, nice big railing right in the way, oh, totally safe. Absolutely meeting code by all means, I'm not against that, but I'm frustrated sometimes in the design of a building and its equipment and combinations where it's completely useless for its intended purpose.

MONONA ROSSOL: But there are codes and you just have to know them and you have to know where to find them. They differ from state to state so you have to do some looking. And if the code says that it has got to be a certain height and because of the lighting that you want to do it can't be that's also acceptable, but put in the fall protection track and say everybody up there has got to be in fall protection the whole time.

EDDIE RAYMOND: You had a question.

DAVID ROSENBERG: Yes, David Rosenberg from Theater Projects. Actually, I take some exception of what you're saying about making the architect solely responsible for fall arrest. You can put in as many 5,000-pound strong points as the building can possibly support. If the owner doesn't take responsibility for training their staff and having the harnesses the size of the people that are going to be using them and putting a training program in place, they're useless.

DREW LANDMESSER: And then policing that program.

DAVID ROSENBERG: Absolutely.

MONONA ROSSOL: That's true, but the point is if it isn't there, you can't start. And the architect has to have it there so that you can start a program. You have to build a building that can be used safely for the purpose for which it was intended. If the client chooses not to, that's not your problem, that's between OSHA and the client. But the building has to be capable of being done safely.

DAVID ROSENBERG: I think deep pockets lawsuits will probably find that not to be the case. That if someone did get injured and people were out there searching for someone to pay for the penalty, I think they would go after everyone. I don't think it would make a difference if you had provided the strong points or hadn't.

I think we owners, consultants, architects, design teams need to work on this issue from the very beginning and make it an inherent design in the building and make it a priority so it actually does occur. And not say, "Well, our responsibility is to do the strong points and then we're done." I think it's got to be a beginning to end process.

EDDIE RAYMOND: I agree with you. And what I said in my opening comments was that when we build buildings where someone has gone to the bother of putting in 5,000-point anchor points and design of useful fall arrest system, and then as you're suggesting, educating the end-user as to

what they're there for and how they're to be used and training that needs to follow so that they are used properly, I think then we've got a system that works.

DAVID ROSENBERG: I would also —

MONONA ROSSOL: Yeah, because — go ahead.

DAVID ROSENBERG: I'm sorry, I'll say one more thing. Fall arrests is only half of the solution. The other half is rescue assistance.

EDDIE RAYMOND: Yes.

DAVID ROSENBERG: Someone could fall and be dangling there for half-an-hour and die because the blood supply gets cut off.

EDDIE RAYMOND: Yes.

DAVID ROSENBERG: So, looking at just the fall points is a very small part of a much larger issue.

MONONA ROSSOL: Oh, sure it is. But the main thing is that the building has to be capable of supporting that proper program and that's the only point I have. And I also when I finish an architectural project, I write a use limitation statement as well, and in there are those kinds of parameters. We've now provided you this, but this is what your problem is.

EDDIE RAYMOND: Okay. We have time for one more question and comment. Yes.

MALE SPEAKER: Well, I was just going to suggest if you want to keep going, I have no *[INAUDIBLE]* but some people here may have show tickets for tonight.

EDDIE RAYMOND: Oh, yes. If anybody needs to leave. I'm sorry. I'd love to take more questions, I think it's a good conversation that deserves the time, but if you need to go I won't be offended and I don't think anybody here will. Yes.

MALE SPEAKER: Part of the answer has to be that in the commissioning process, there has to be proper operations and maintenance training because that's how you pass off the knowledge of how these systems need to be used. That's how you get around the liability and that's how you make sure that that's being put in the hands of the operator. That's where, I think, that piece gets filled out.

EDDIE RAYMOND: My biggest frustration in theaters — and I'm actually working with one of our high schools with this problem — is that a theater can be commissioned and it's a high school theater, who then do you pass along that training to and make responsible for teaching proper use of that space by the students who are then going to be the operators of that space.

It's a very difficult problem because first of all, the person that operates a theater probably isn't a technical theater person and often it's the drama teacher who may, like me, have been an English major and is completely unqualified to teach anything about the safe use of technical theater. So, I think there is no standard for that in the educational level.

And secondly, there's such a turnover in that group that while the first person who took the building over when it was commissioned is no longer there when the next group of students comes through to be educated. We don't have a standard in this country to meet that.

MALE SPEAKER: Yeah, but at a certain point, you need to be able to provide the operator with the tools. You need to weigh their responsibilities and make sure that they're made aware of it. And then, at that point — that's your due diligence.

EDDIE RAYMOND: Yes.

MALE SPEAKER: And then at that point you have to assume these guys are smart enough they went out and bought a nuclear reactor and they know how to run it. You know, you have to make that clear. Yeah.

EDDIE RAYMOND: Yeah. Sorry, polymer reference. I think in the commissioning of an educational theater, I think that the district, the school district, needs to be made finally responsible for what goes on in their buildings because they're the ones that hire and fire people and hire people based on their qualities and their qualifications. Yes.

TONY KAM: I'm Tony. I'm from Singapore. And speaking from an educational institution - this will be ironic — I think it's not so much about educating the students. I'm looking at it from — I'm pretty lucky, I was empowered enough to be able to hire a full-time crew to be onsite throughout. I think most of the time, especially when it's got to do with municipal buildings, what ends up happening -- this is very obvious in Singapore — where the distinct government or the distinct legislation just puts in two technicians who can be general building technicians, for all we care, to run this space. And this was the situation in Singapore for many years. It's only in the last six, seven years that we started hiring theater professionals and I put that very loosely, because anybody who can hang a light is called a theater professional.

I've started this training program to train the crew. It's very difficult to get going from an owner's perspective because that's cost. We're talking heavy cost to send them for the proper training. I think the onus should be set back onto I'd like to say the consultants to ensure that proper documentation of the training processes are handed over as part of the commissioning. Because I could leave, but the operations manuals and training manuals has to be there and that will never change.

DREW LANDMESSER: I would say that almost every theater consultant as part of their specifications requires that their owners multiple copies of owners manuals for dimming systems, rigging systems, great receding, every piece of equipment there are multiple copies of those owners manuals with diagnostics, with phone numbers, that kind of stuff that are part of that terminal, so that's a very standard component.

BILL SAPSIS: Some bum that just walked in. *[LAUGHTER]* I have yet to see a specification come across my desk that carries any fall protection issues in it, other than maybe a line reference to do fall protection.

DREW LANDMESSER: Quite often the actual fall protection is not a component of the theater consultant, its part of basically the architectural side of it. So, we will provide — like myself, we will provide that information to the architect part of it, but it's not a part of a "theater equipment item."

MALE SPEAKER: I don't get that.

MALE SPEAKER: No, I'm just saying —

MALE SPEAKER: I'm a contractor, right, and I'm going to stick this stuff in there and I'm going to be responsible for it. I'm that first line of defense when something goes wrong. The owner is going to come to me first because I was the last guy there. Okay. They may not stay with me, they may run to a deeper pocket behind me, but they start with me and I'm looking for that information. I don't care where it comes from, but it's not there.

EDDIE RAYMOND: When we commissioned the Geary Theater there was a bookshelf six feet wide of technical manuals for all of the working pieces of the theater. There was not a single thing mentioned, in any of the ones I looked at, about training. There was not a single standard for training.

There was a disclaimer that said, "This piece of equipment should be operated by trained personnel." That was the big stint of the comments about training.

And I think what the comment was about — correct me if I'm wrong, from my brother from Singapore — is that when a building gets commissioned not only should there be a technical manual saying this is how this stuff works, but the people who operate this need to have this set of skills. Even if it doesn't go so far as to say here's the course work, here's where you need to get the training, or here's what they need to live up to or something. So, especially in educational facilities where there's such a turnover and not a tradition of highly skilled technicians working in them, you have some standard by which you can measure the people who are operating that too.

DREW LANDMESSER: I can't speak for all consultants, but I know that the majority of the groups like at ASTC part of viewing the owner's manual there's also X number of hours of training in the operation of the lighting system, of the dimming system. I can't speak for all, but I know there are a huge number of them that that training is included in addition to — independent of the turn on of the dimming system, there's also training for owner's *[INAUDIBLE]*, etc. And so that is something that may not have been as good at one time, but I know is getting much better currently.

EDDIE RAYMOND: We're having our own argument.

MALE SPEAKER: We'll talk amongst ourselves.

EDDIE RAYMOND: Okay. You guys have a good time. Does that include the specific — is that training documented or is it done by, for example, the contractor who installs your rigging system is then obligated to have so many of hours of training for the person who is going to use it, but then that training itself is not documented. That's my point.

MALE SPEAKER: And who does maintenance?

MALE SPEAKER: Yeah, some of us are requiring that in our specifications.

EDDIE RAYMOND: Are you?

MALE SPEAKER: We require documentation of the training and we also require attendance lists to be filled out for everybody who is there at the training.

DREW LANDMESSER: So, does the documentation include what was trained?

MALE SPEAKER: Yes.

MALE SPEAKER: Excellent. I think that's a step forward.

MONONA ROSSOL: Because OSHA requires that. OSHA requires documentation of training and proof of comprehension so you need a test.

MALE SPEAKER: It's not uncommon on the traditional lighting system for the consultants to require us to video tape it and turn over whether it's a tape or CD along with the manuals and the list of everyone who was there. So, it may be more difficult to do with a rigging system, but we do that with lighting systems all the time.

EDDIE RAYMOND: Right. I think that needs to become more widespread.

MONONA ROSSOL: Just attendance, I mean, you can get in a room and fall asleep and that's it. You really have to have some kind of proof of comprehension. And that's why I like the ASTA training programs at least for theater electricians and riggers. That's a start. It's just a start, but it's something that has to happen.

TONY: Yes, I fully agree with what you just said. Most of the time — I don't know if it happens here — but the training component, like you said, is included as part of the contractor's obligations or the manufacturer's obligations. The training component now consists of maybe two days of classroom session from the contractor who may or may not understand the equipment.

We just put in our dimming system and the guy who comes in couldn't figure out the Ethernet and he's giving me the training. So, he's fulfilled his training obligations. He's said sit down; I'm going to teach the whole crew about the dimming system. And we had a question about the Ethernet and he goes, "Oh, I've got to check up on that."

So then, I questioned the quality of the training and who should it come from. Should it be the manufacturers directly or contractors, I don't know. So, if you take Uncle Bill for example he'll come in and talk about safety, safety, safety, safety, some of the contractors may not have that kind of priorities.

So, where then do we draw the line and is there a standard for that?

EDDIE RAYMOND: Not yet. I think that's a really good question.

MALE SPEAKER: Not yet.

EDDIE RAYMOND: Not yet, but I think drawing attention to it is very important. There are groups, beyond the people who commission the buildings, who are trying to actually draw circles around what the training for all these different jobs in theater should be. You know, the ESTA Foundation is working on trying to corral this so that there's some consistency to what's taught and that it's relevant to the people who work in the industry. And it's also vetted by professionals within the industry so that we're teaching useful things that are relevant to the people, not just fulfilling our obligation to have training.

DREW LANDMESSER: And I would encourage you, as you on the owner's side, to not agree to the fact that the proper training was provided as called for as part of the project. If he was someone who was not knowledgeable and could not train you in it, then they did not meet the requirement of that specification to provide you with that training and you can reject it.

TONY: And I did.

DREW LANDMESSER: Good.

EDDIE RAYMOND: Well done. We like rabble-rousers. Are there any other questions?

In that case, I'd like to thank my panel. Thank you very much. *[APPLAUSE]*

And thank you. We'll see you around.

▶ **Panelists:**



Eddie Raymond (Moderator)

Eddie Raymond is the Vice President of IATSE Local 16 and currently employed by the local as an assistant to the Business Agent with a primary focus on training and organizing. His career has included working for the American Conservatory Theater as well as variety of other employers including many stints at Industrial Light and Magic. He is on the ESTA board of directors and the ETCP Certification Council.



Drew Landmesser

Drew Landmesser has been a fixture behind the scenes at major American opera houses for more than 30 years. He is currently production director at San Francisco Opera, and previously he was at Lyric Opera of Chicago and Houston Grand Opera. Landmesser recently managed the design and construction of San Francisco Opera's high-definition video production suite, which includes eight robotic cameras and four manned cameras, and video and audio post-production facilities. While in Chicago he oversaw a 3-year, \$100 million renovation of the Civic Opera House, and planned and supervised the completion of Lyric Opera's 99-motor, computer-controlled rigging system. In Houston, he represented the opera in the construction of the new Wortham Center. Landmesser has been responsible for more than 200 opera productions, supervising stage directors and designers, set, props and costume construction, stage management, and wigs and make-up.



Monona Rossol

Monona Rossol is a chemist, artist, and industrial hygienist. From 1977 to 1987, she practiced industrial hygiene at the Center for Safety in the Arts in New York. In 1987 she founded ACTS (Arts, Crafts, and Theater Safety) and continues this work to the present. She has been a full professional member of the American Industrial Hygiene Association since 1984. Since 1995, she has been the Safety Director for Local USA 829. She lectures and consults internationally, writes a monthly newsletter for ACTS, and has written seven books, one of which won a Choice Outstanding Academic Book Award from the Association of College and Research Libraries.



Darrell Ziegler

Darrell Ziegler is an Associate and in-house theatre consultant for Westlake Reed Leskosky. For more than 20 years, he has lead the performance technical system design and specification efforts for more than 175 historic theatre and performing arts projects located across the United States. These projects range from performing arts high schools to Broadway theatres to the Kennedy Center for the Performing Arts. He was the original technical director for the Joyce Theatre in NYC and also a Broadway stage manager. He is a member of the American Society of Theatre Consultants, USITT, USITT Desert States Regional Section, League of Historic American Theatres, the Theatre Historical Society and Actors Equity Association.