

**General Safety Precautions**  
**Prof. Jamin Mehta**  
**Department of Industrial and Systems Engineering**  
**Indian Institute of Technology-Kharagpur**

**Lecture-23**  
**A Case Study on Construction Safety**

Hello everyone, my name is Jamin Mehta. Today I am going to talk to you about something there is really important to me, personally and professionally and that is safety. Before I get into the details of it just a little bit of background where I come from, what I do? I work in the field of construction, project management, construction management, consulting, program management; I have worked about 15 years in the U.S and 9 years in India.

And fortunately, I have always somehow found myself working with the top ten global firms, why I say fortunate because there is one thing that I have consistently learned from them, is the importance of safety. Why is it so important to enforce safety to understand safety? Today I am going to talk to you about MEP safety mechanical, electrical and plumbing. There is if you look at it there is no particular silo that says ok, this is how you keep yourself doing mechanical things and this is how you keep yourself doing electrical things.

Of course, there are safety codes that will in details define how do you make sure, how do you kind of ensure that you are safe and the people working around you are safe, doing these different things related to mechanical, electrical and plumbing. However, I am going to take it a little above say I am not gonna go into details of exactly what it takes to apply all of these rules because otherwise I will be here for the entire day and you do not want me here the entire day.

But what I want to stitch together is, why is it so important and how does the common safety thread stitch through mechanical, electrical and plumbing? Now let us look at I would say mechanical services what mechanical work could you be doing that will involve proper enforcement of safety? It could be installing HVAC systems, the air conditioning vent, it could be the fire protection systems.

Imagine if you are on an industrial project or even working on airports or working on hospitals. There are so many of these HVAC elements this fire protection elements in any buildings wherever you go you will have these mechanical services that you have worked with. How do you make sure that you do not get injured or you do not injure somebody else while working in this particular silo? I will come to that, let me first go through the MEPs and then we will come back to that.

But in particular whenever you are dealing with this kind of hazards, whenever you are dealing with mechanical, it could involve even lifting things, it could involve moving things around, it could involve a lot of cranes. So, a lot of these things they could be actually you can find them when you are doing, you can find these kinds of risks when you are doing electrical as well, when you are doing plumbing as well.

But to be more precise what are the risks when you are installing electrical services? What kind of electrical work that you are doing that is going to cause you risk? You could be for example installing high tension cables even when you are doing the power distribution network. There is easing, there is a fire detection and alarm detection system that you could be installing, there is public address systems.

There is a CCTV, there is a what do you call it that is iBMS the intelligent and integrated building security system. So, there are all these different systems that you could be working on within the arena of electrical work. But there is one underlying thing that impacts all of that where you have to be careful is the life current going through it. Now you would say ok, I will be careful, I want to make sure that when the switch turns on, when the current goes through, I am safe, no, that is not enough.

There are so many other things that you have to make sure while doing, while installing this electrical work that will keep you safe. And that plus the work that you do with the mechanical all those will overlap and I will show you now. In the plumbing services, so whenever you are installing plumbing where it could be your domestic water systems, flushing water, sewage mains, rain water you could be building water treatment plants, sewage treatment plants.

You could there imagine you are lifting a pipe from one place and going to another, you are using a crane. If you are doing electrical, imagine the HDPE pipes that are now used for example if somebody is installing a fiber network. They go in these HDPE pipes; and the swindles, the rolls of these pipes are really heavy. So, either it is the electrical cables or the pipes or even the water pipes, whatever you use to move the common factor is the crane, the common factor is the lifting equipment.

People are also moving things around, whether you are working in electric ME's or P's, there would be people who would be bending things, people would be lifting things. They will be pulling and pushing, they will be cutting things, one of the areas where most of the accidents happen, whether you are in mechanical, electrical or plumbing is people falling from heights, did you ever think about that?

People have died falling from 6 feet height, as high as 6 feet you would think that hey, I am 6 feet tall and just somebody falling off from there, how can somebody die? Statistics say that, the top 10 violations around the world they are actually official, every year this particular thread as you call it gets updated, it gets recorded. And number 1 is the fall protection, people actually falling from heights.

You could be doing some mechanical work, you could be installing a duct overhead. And you are simply on a ladder or on some kind of lift and if you are not tied properly if you fall down, you can actually get fatally injured or it can cause death. There are many other such scaffolding issues, there are machine guarding issues, that is one thing I see a lot in India is that whether you are cutting pipes, whether you are putting edges on ducts, people do not use proper gloves.

People do not use; people do not maintain their equipments you have these cutters and if you do not have the guard on it, that is one of the basic no-no's. But then people simply go ahead with it and they take shortcuts and that is how you get injured. Imagine eye protection, face protection, if you are welding you could be attaching things, you could be simply driving a nail somewhere and if it just snaps and hits your eye.

How many times you see you go to the construction site? I challenge you how many times you go to the construction site and you see people? The guys who are actually working there are wearing these safety glasses, I do not see that a lot. Especially here in India and I keep on forcing it, I keep on forcing it is difficult but it is doable, you have to be persistent. You cannot simply say what I tried but these guys are just not listening, no, that is not gonna work.

Mechanical, electrical, plumbing all that are offered, it does not matter what work you are involved with. But there are basic PPE guidelines, the personal protective equipment guidelines that you must follow and you must make sure that the people working with you follow. What is the one common thing? Well, that is what I pleased that is how I look at safety, what is the one common thing that can really help manage safety?

That can really that one common thing that is going to drive you to the finish line every day is attitude. You want to have; you want to carry an attitude where you are constantly spreading awareness about safety. You are trying to make sure that the people working around you are safe, whether it be ME or P, it could be anything, it is common sense. If you think, if you look around and ever if you think that there is something unsafe here, it probably yes.

It probably yes, speaks up, find out, it is common sense but do not give up. I really hope that you take safety very seriously for yourself, for your family, for your friends and for the people who work with you on the sites. Because they are the ones who are exposed to acts of unsafe behavior at all times. Thank you.