Glass Processing Technology
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Lecture - 11
Safety in Glass Handling

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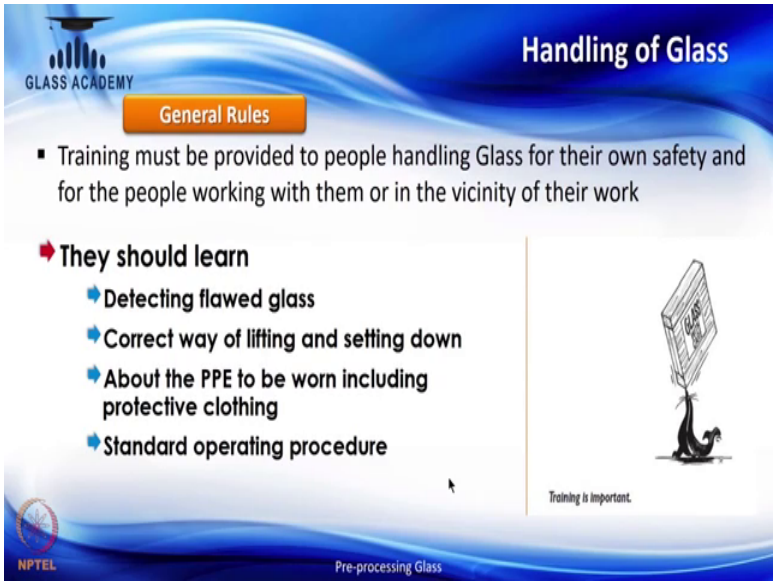

Now, in handling of glass, the general rule is that the training must be provided to people who are handling the glass for their own safety and people working with them also and they should learn detecting a floor glass or glass which can break. There is a correct way of lifting and setting it down, which are all the personal protective equipments that needs to be worn including protective clothing and there should be a standard operating procedure for all the glass handling purpose.

So, these are all the things, which the people who are handling the glass, they must be knowing it before getting into this operation.

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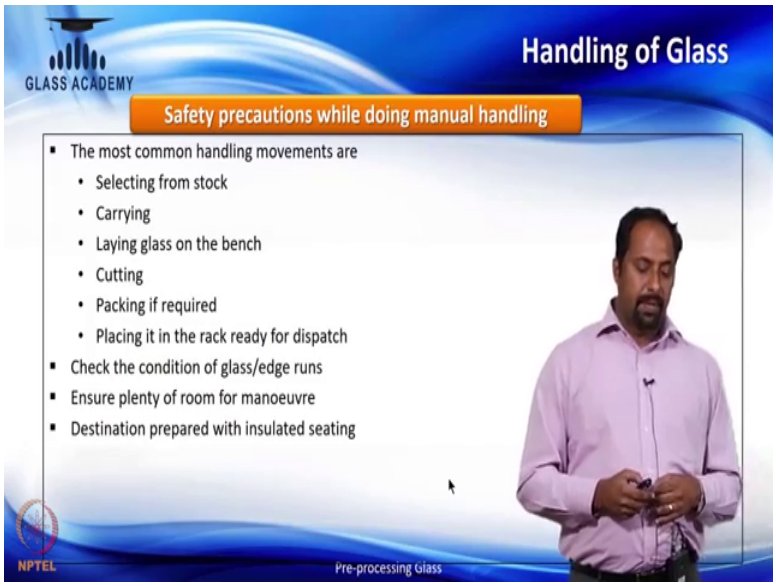

Other safety precautions while doing manual handling is see the most common handling movements are selecting from a stock and then, carry this glass, then laying glass on the bench, then cutting, then packing they do it, then placing it on the rack ready for dispatch.

So, basically you need to check the condition of glass and its edge runs an ensure plenty of room for manoeuvre and destination prepared with insulated seating. So, these are all the safety precautions, which need to be taken care while doing the manual handling of glass.

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While doing a manual handling, you know sometimes what happens that glass will tend to fall. So, that point of time you know it is a basic human instinct that you know you go there and you can see try to stop the glass. Never ever do that because it is the most you know dangerous operation where you feel that you know you can stop the glass, but as a pile know it will come on to with. I have a video for that and the video can be shown.

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Now, there is another unsafe act which is commonly people do is if they want to take a defective piece from the pile of glass kept in between from that, they try to pick it up

which is also unsafe because the other few sheets, which you feel that you know you can comfortably hold and pick the glass from in between that never happens and the complete glass, it will actually disturb the angle of stacking and the complete pile can fall on to you. So, this is another major unsafe act that result into kind of an accident in glass storage.

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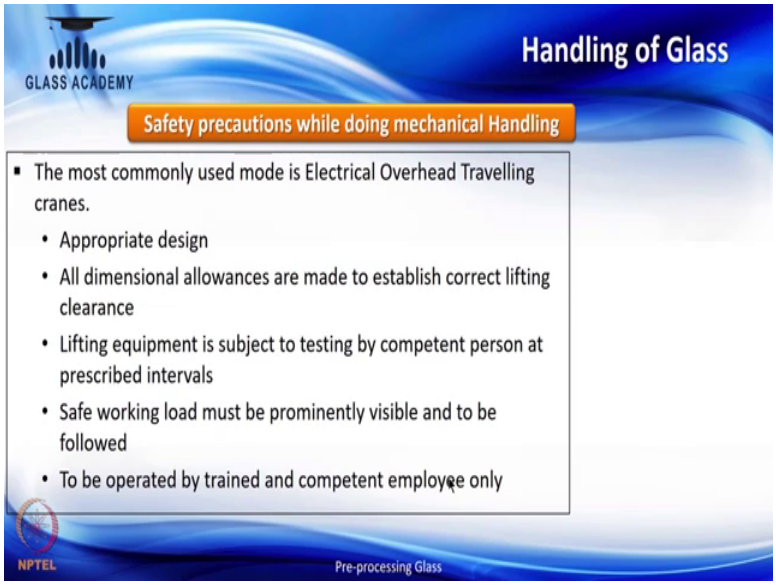

Now, while doing mechanical handling, the most commonly used to mode is electrical overhead, traveling cranes, EOT cranes and it should be of appropriate design, then all dimensional allowances to be made and established, correct lifting clearance and lifting equipment is subject to testing by competent person at prescribed levels. So, then safe working load must be prominently visible and to be followed to be respected, people should be aware of what is a safe working load and it is to be operated by trained and competent employee only. So, these are all the precautions which we need to take care while doing a mechanical handling.

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When we do the mechanical handling, the EOT crane what you can really see is the path in which you take the glass. It should be free of obstructions and operator must be positioned outside the glass falling danger zone always.

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Another precaution what we need to take is the operator must make sure that he has an escape route at all times during the lift in case of falling glass.

So, there should be adequate space and he should be aware the area where, which he is handling the glass and in case of any fall which area he need to evacuate or escape from the glass falling zone safely. This leads to be quite aware material handling using FLT.

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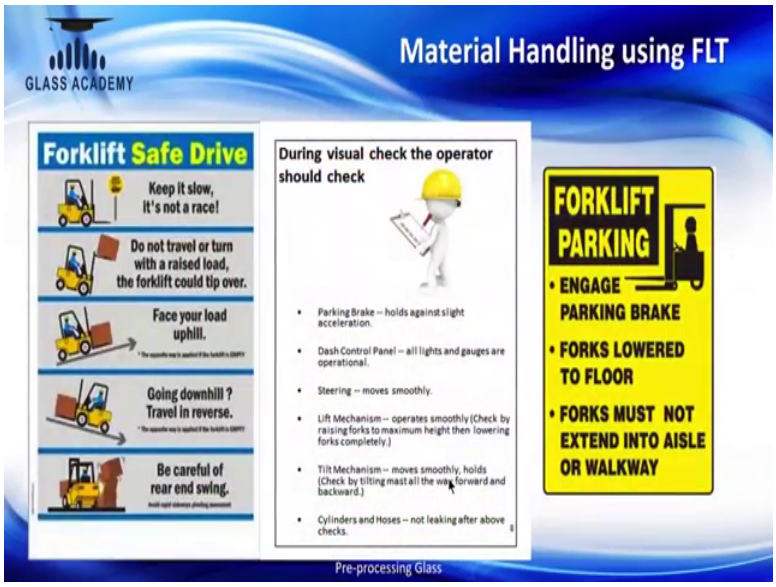

See forklift is one of the dangerous equipment that is carried that is running in the warehouses mostly glasses handled many with the forklift trucks.

So, it is only a trained skilled operator need to run the forklift when it comes to glass handling. It is not only the skill of the driver or driving part that also matters, but your skill of you know picking the glass or handling the glass, transporting the glass, taking the load all those skills coming into picture. So, glass handling with FLT that needs to be treated as a separate domain and the skill set and operator must be trained both on FLT driving as well as glass handling safety.

Forklift has to be driven safe, keep it very slow. The FLT speed must be you know you can identify that it is 7 to 10 kilometer per hour only and do not travel or turn with raise load. The forklift could trip, it can tip over and then, face your load uphill and going downhill travel in reverse when you have a, you know obstruction in your vision and be careful of rear end swing.

Basically before start of each of the shift, the operator should check some minimum forklift, check should be followed like you know checking of the brake, then all lights

and gauges are operational, steering moves smoothly, lift mechanism, tilt mechanism, cylinder and hoses not leaking, all those things. So, while FLT is under parking condition, engaged parking brake, then forks is always lowered at the floor and fork must not extend into aisle or walkway.

So, these are all some tips or safety precautions, which needs to be taken care while using forklift truck inside the glass warehouse operation.

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Then, in these photos you can see that you know walk inside the walkway and usage high visibility reflective jacket. So, this is one best practice because forklift truck when driving with the load, the pedestrians it need to be easily identified and convex mirrors we discussed this point that convex mirrors to be used to spot or mitigate the risk of blind spot and speed limit in shop floor should be maintained less than 7 kilometer per hour or 10 kilometer per hour and pedestrian must not be you know around the forklift. There is something called as forbidden circle. It is just 2 meter radius of around the forklift. So, nobody should be near to that forklift truck because at any point of time, forklift truck can turn, twist and can hit the person and result into a kind of a safety injury.

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This is some few you know exemplary photographs to demonstrate, what do you mean by a dedicated pedestrian pathway with physical barriers. People are protected from the risk of glass as well as forklift carrying glass.

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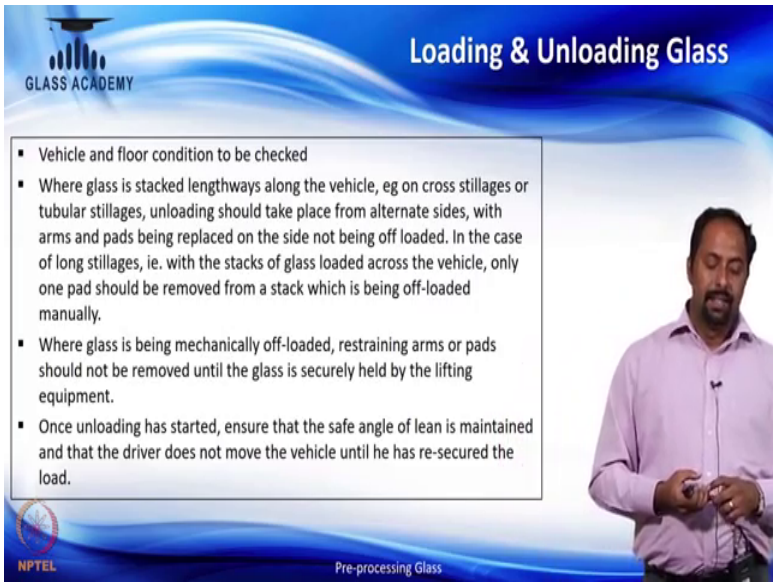

When it comes to loading and unloading of glass, the first thing what we need to check is the vehicle and the floor condition of the vehicle need to be checked thoroughly, then where the glass is stacked lengthways along the vehicle example on cross stillages or tubular stillages, unloading should take place from alternate side with arms and pads

being replaced on side and not being off loaded. In the case of long stillages that is with the stacks of glass loaded across the vehicle, only one pad should be moved or be removed from the stack which is being off load manually and where glass is being mechanically off loaded, restraining arms or pad should not be removed until the glass is securely held by the lifting equipment and once unloading has started, ensure that the safe angle of lean is maintained and that the driver does not move the vehicle until he has secured the load.

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Now, you can see the truck how it looks like with a frame putting and there it is ready for loading and while unloading the glass from the truck, do not stand in glass falling zone unless it is secured. So, it is important that you know we should not be standing if when it is loading or unloading, not to stand in the truck in the glass falling zone and even if somebody there is a need for standing there, it is to be done only after securing the glass.

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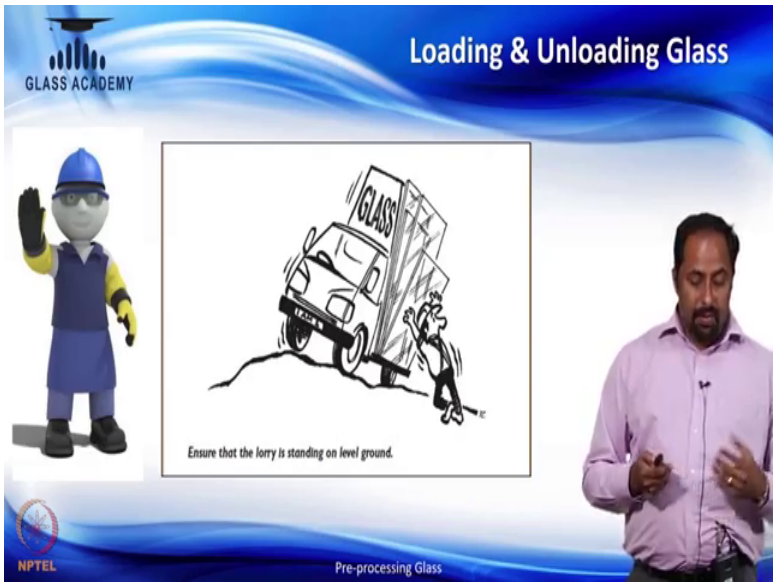

So, ensure that the truck is standing on level ground when we load or unload.

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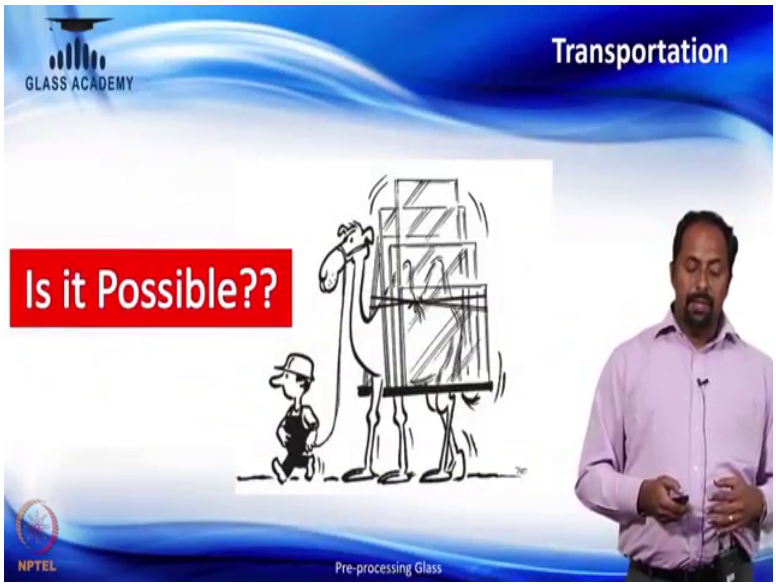

Now, coming to transportation, ok. In this picture what it is clear that this is not the way to transport glass. In the modern age, we have lot of you know newer methodologies, technology, mechanisms to transported.

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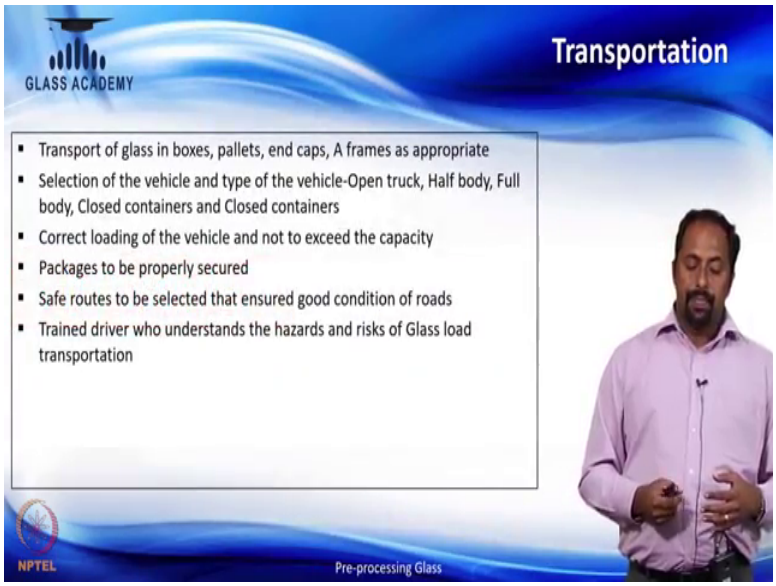

Now, transport of glass in boxes, pallets and end caps frames as appropriate. There is a methodology. There is a glass to be handled properly in boxes, pallets, end caps and selection of vehicle and type of vehicle whether it is open body, open truck, half body, full body, closed containers or half closed containers or all those things we need to take care and correct loading of the vehicle and not to exceed the capacity and packages to be properly secured inside. After loading all the packages whether it is box, pallets, end caps, frame whatever it may be, it needs to be secured and safe routes to be selected that you know ensure good condition of roads and the train driver, which is very important who understand the hazards of risk of glass and when it is transporting.

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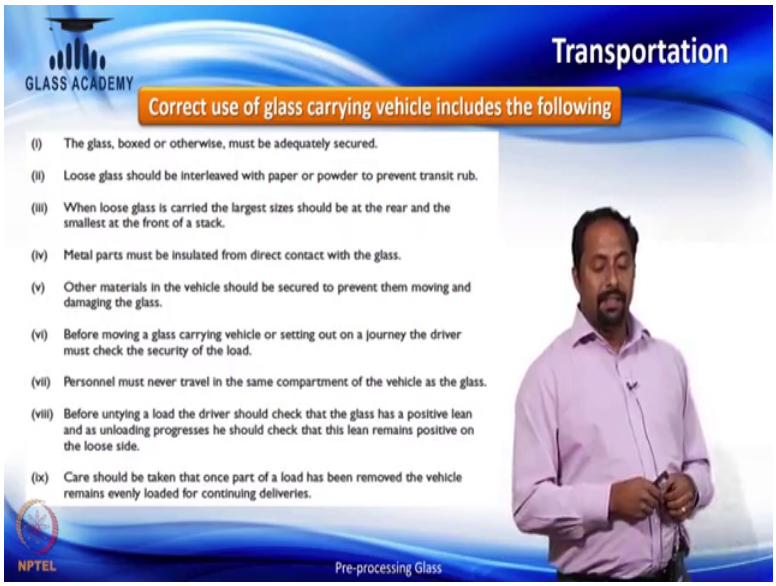

Correct use of glass carrying vehicle includes the following. The glass boxed or otherwise must be adequately secured. This we discussed and then, loose glass should be interleaved with paper or powder to prevent transit rub, then when the loose glass is carried, the largest size should be at the rear and the smallest at the front of the stack, then metal parts must be insulated from direct contact with glass otherwise glass can easily break.

Other materials in the vehicle should be secured to prevent them moving and damaging the glass, then before moving the glass, carrying vehicle or setting out on a journey, the driver must check the security of the load and personnel must never travel in the same compartment in the vehicle as the glass. So, the human personnel who are it may be driver or the helper, they should be traveling in a separate cabin.

Before untying a load, the driver should check the glass has a positive lean and as unloading in progress, you should check that this lean remains positive and on the loose side. So, care should be taken that once part of the load has been removed, the vehicle remains evenly loaded for continuing deliveries. So, this is one important point need to be carried over.

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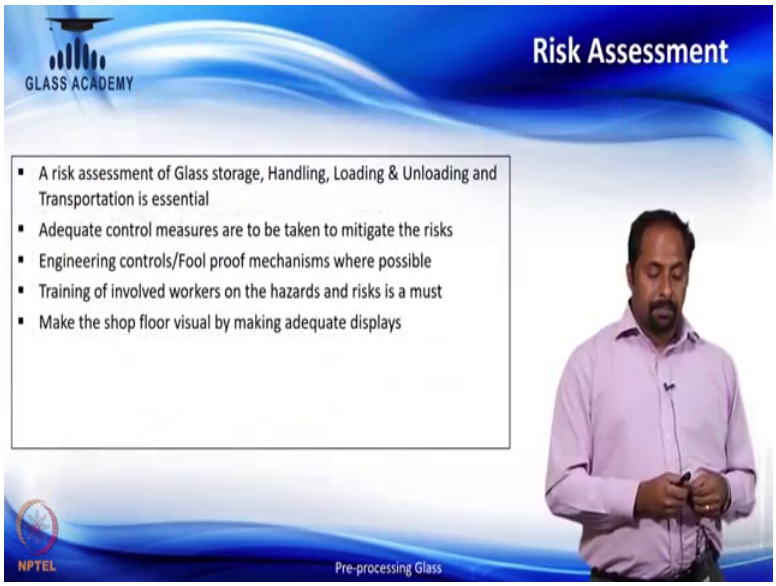

Now, we will talk about the risk assessment which is a risk assessment. There are ways and means of doing a risk assessment, but it is a kind of a culture what we have first, we need to accept that. Glass handling or transportation or storing has got its own hazards and subsequent or risk towards. So, this we need to appreciate. So, a safety mind is required to approach the handling of the glass. So, we can do a risk assessment what can go wrong or how an accident can result or what can result into a kind of a personal injury.

So, in the glass storage handling, loading and unloading and in transportation, this needs to be carried out. Risk assessment and after risk assessment, we can identify that there are some sort of, there are major risk that is coming out of this process which we need to have some control measures, so that you know this is not affecting the operation. So, adequate control measures are to be taken into care and mitigate the risk. They need to put in place for example, if there is a securing is required, without securing it is a risk. So, we need to provide means of securing the glass and like that.

So, then lot of engineering controls or fool proof mechanism wherever it is possible, whenever we use EOT cranes or any type of glass handling or a machinery safety guarding is required for a cutting. So, all those places where we need to put the engineering controls and training is very important based on the risk. In glass handling, people need to be trained, they need to be talked, they need to be told these are all the

risk areas or risky part of this operation and this is the standard operating procedure which they need to follow, so that you know they are not hurt and make the shop floor visual by making adequate displays.

So, this is what it means by a risk assessment. Appreciate the risk and then, put in place in adequate controls and respect the controls by adequate training to the people and then, monitor whether people are aware and they follow the safe operating procedures and adequate risk control measures are in place.

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This is about personal protective equipment. So, a personal protective equipment has got a connotation with the risk involved in that activity. If it is related to cut injuries, then people have to wear when we handle the glass with you know the hand and all we need to have cut resistant gloves. So, based on the risk involved in that particular area, we need to select the personal protective equipment otherwise.

So, basically in glass basically we use lot of cut resistant stuff whether it is gloves, whether it is leg guard, whether it is sleeves which covers the complete arms and then, goggles, safety goggles is very important because the chip of pieces or projectiles of glass pieces can damage the ices and then, helmet is very important, hard hat or head protection basically because there lot of EOT cranes or overhanging glass or glass which is taken as a load. So, this is important to have helmet and then, foot protection is very important because we are into a place where glass can fall on the leg and there are

frequent movements of forklift trucks. There is a possibility that you know the food can get stuck into forklift tiers and all those things. So, a good safety shoe with metal cap is very important to be worn safely in order to safely handle the glass.

So, there is a picture of a person who is putting this all this PPE. You can see really see the helmet, the goggles, the high visibility jacket which is also, which also can be a cut resistant or protection material, then you can see the Kevlar or Dyneema hand gloves which is cut resistant and then, Kevlar sleeves which is again cut resistant which protect the arms shoulders and then, your foot protection is required with the safety shoe and leg guard is also provided for protecting the leg from the broken or projected glass.

So, these are all the basic personal protective equipment which needs to be taken care and people need to be trained on how to wear this personal protective equipment and it is a good idea to have a monitoring mechanism and counsel the people or those who are not wearing the personal protective equipment and talking to them on the consequences of you know if they do not wear, what can happen.

So, safety as a whole it is about understanding the risk in the workplace, then deploy the engineering controls and other control measures to mitigate the risk and train the people in order to handle it safe. Then, at last for the residual risk, we need to protect the people with personal protective equipments, good quality personal protective equipments, which comply to the standards basically if it is in Indian standard or you can go with the en norms. So, this is the way it needs to be handled.

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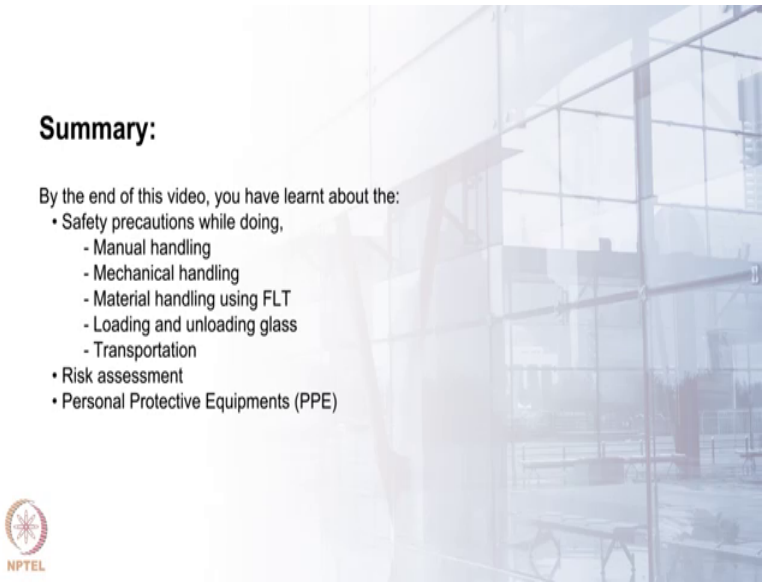

So, with this we are coming to an end of the session where we talked about various risk involved in glass handling and some best practices and how to do a risk assessment and then, put in place various control measures and what is importance of training the people on glass handling safety and the control measures and the importance of implementing a good personal protective equipment program and select PPE and ensure that people are wearing PPE and then, handle the glass safely. So, with this we are coming to an end.

Thank you very much for your patient listening. Thank you once again.