

Principles of Construction Management
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Lecture - 26
Safety organization and safety officer

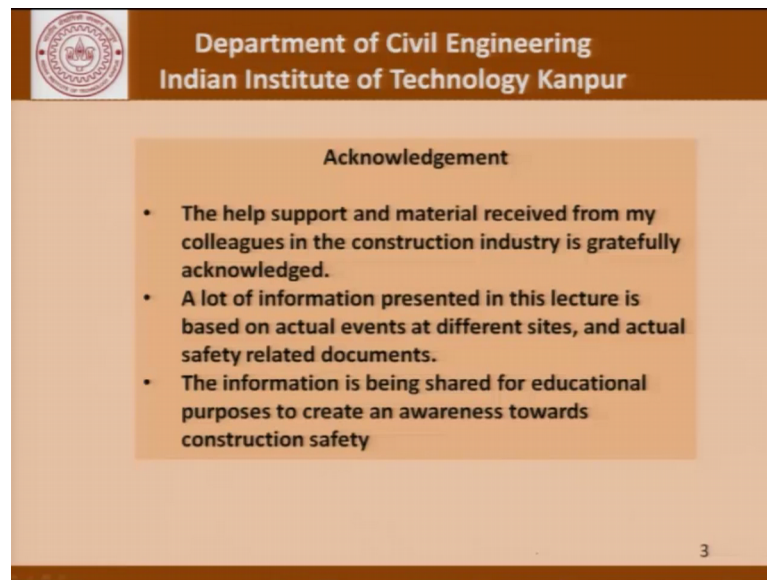
[FL] and welcome once again to this series of lectures on Principles of Construction Management where we are talking about all the different facets or at least some of the important facets of construction management especially as it occurs on the construction site. So, in the last few classes we have been talking about construction safety.

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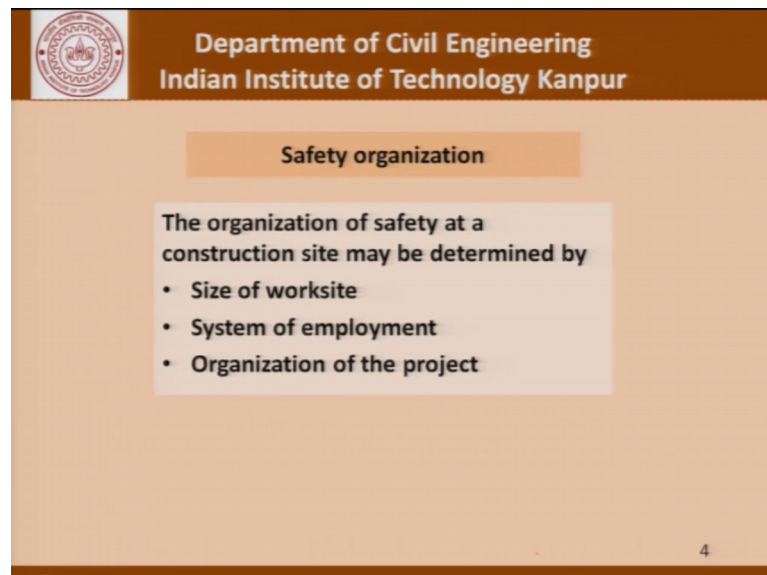
And today we will be talking about the safety organization, the safety officer and the role and how he goes about carrying out his responsibilities.

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Before we get started with our discussion, I would like to once again reiterate my acknowledgement and gratefulness to all my friends in the construction industry who have contributed generously or have allowed me to use some of the material from their presentations and their discussions with me.

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So, moving forward when it comes to safety organization we have been talking about different aspects of construction safety, we have talked about the definitions, we have talked about the statistics and the performance evaluation as far as safety is concerned.

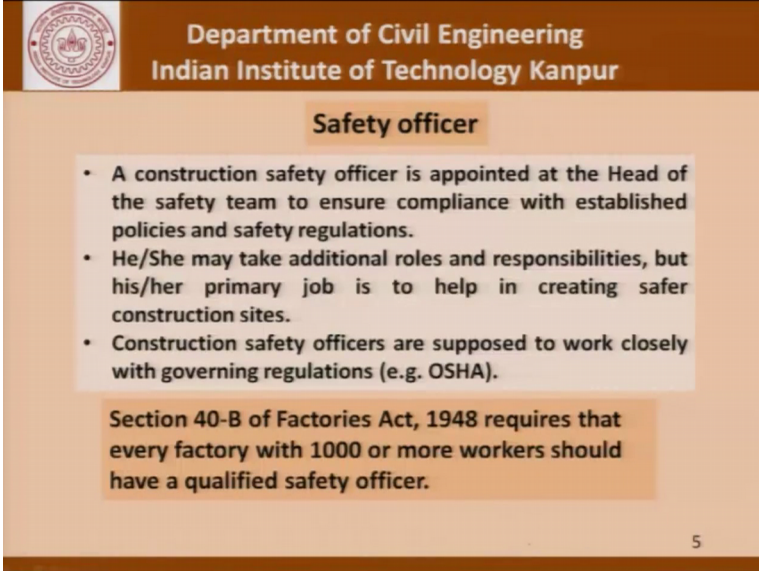
We have talked about the PPE which is required at the construction sites for the workers to protect them from harm. We have talked about the need for training; we have talked about the need for induction training of all employees and so on.

The issue for today is how does an organization go about implementing all these things at a construction site. So, with the organization has to have a safety group a department or a section of people who are specialized in that who are called upon to take that responsibility which is not necessarily a mainstream activity and that is something which we will talk about later.

So, as far as a safety organization at a site is concerned, the organization of safety at a construction site may be determined by the size of the worksite; obviously, depending on the size of the worksite the number of people who are employed in the safety department or as a safety group need not be the same. The system of employment and the organization of the project, it depends on what kind of an organization or what kind of a contract it is whether we are sitting on the client side or we are sitting on the contractors side each side has its own vision, its own understanding, and its own roles and responsibilities. Therefore, the safety organizations that are set up by different stakeholders at different sites could be different.

The discussion in today's class is largely focused from the point of view of a contractor's organization. That is we will be talking about the roles and responsibilities of the safety officer and the safety organization as far as a contractor a person who is actually executing a construction project is concerned.

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Safety officer

- A construction safety officer is appointed at the Head of the safety team to ensure compliance with established policies and safety regulations.
- He/She may take additional roles and responsibilities, but his/her primary job is to help in creating safer construction sites.
- Construction safety officers are supposed to work closely with governing regulations (e.g. OSHA).

Section 40-B of Factories Act, 1948 requires that every factory with 1000 or more workers should have a qualified safety officer.

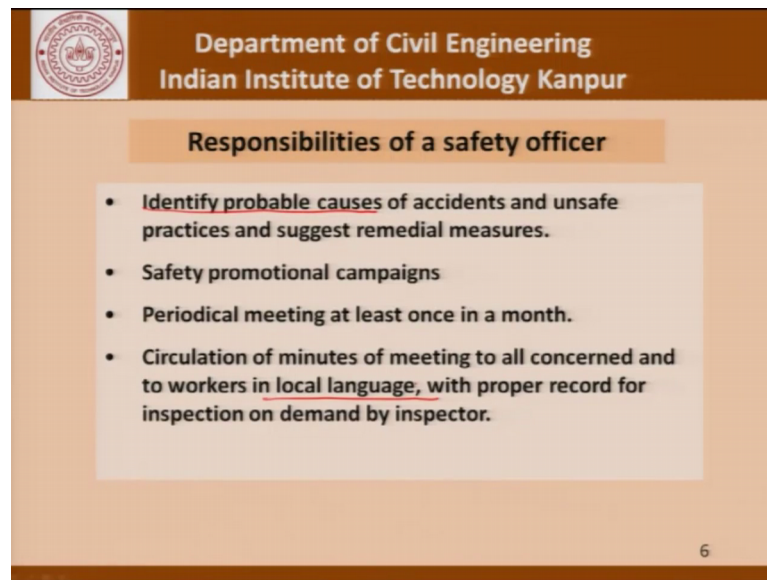
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Now the safety officer in a construction project is appointed at the head of the safety team to ensure compliance with established policies and safety regulations which also include implementation of all programmes related to safety and sometimes it is not only safety, but it is also health and environment. So, the HSE or the health safety and environment or safety health and environment these are all part of the portfolio of a safety officer.

Though he or she may take additional roles and responsibilities, but their primary job is to help in creating a safer construction site. Construction safety officers are supposed to work closely and be familiar with governing regulations whether it could be OSHA or any other. And section 40-B of the factories act 1948 requires that every factory of one thousand or more workers should have a qualified safety officer. We must understand that construction sites are a very special place of work. And whether the factory act is applicable to them or not is a different story and the fact is being sighted only as a reference.

Now, continuing forward let us talk about the responsibilities of a safety officer and this I am afraid is a very long list.

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Responsibilities of a safety officer

- Identify probable causes of accidents and unsafe practices and suggest remedial measures.
- Safety promotional campaigns
- Periodical meeting at least once in a month.
- Circulation of minutes of meeting to all concerned and to workers in local language, with proper record for inspection on demand by inspector.

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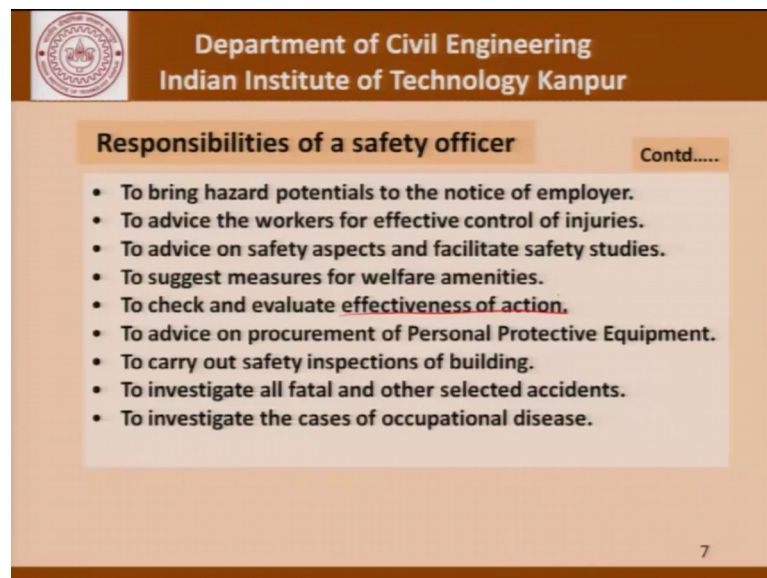
Identify probable causes of accidents and unsafe practices and suggest remedial measures. So, this requires foresight and experience. So, when you are identifying probable causes you have to know what is the kind of site, what is the nature of work and then only you can identify the probable causes. So, one of the important jobs of a safety officer is identify these causes and suggest remedial measures. Carry out design and carry out safety promotional campaigns, periodical meeting at least once a month the frequency could be different, but he is responsible for holding these. Safety meetings circulation of minutes of these meetings to all concerned and to workers in the local language with proper record for inspection on demand by the inspector.

So, here we are talking about local language, especially in a country like India. Where the construction sites the workers involved could be at different places where the local language is different. It need not be English, it need not be Hindi, it need not be Tamil or whatever it is the fact of it remains that in order that the safety message reaches the cross root worker the last worker at site. It is important that the communication is in the local language. The communication is in a language which is most widely understood to the extent possible it is understood by all. If it is required let the safety messages be done in different languages in the site, So that is once thing. The second thing is keeping a record of all the meetings decisions and implementation programmes to be produced on demand by the inspector. So, the inspector here we are talking about are regulatory agency. Now the regulatory agency functions outside the contractor client system. So, the regulator is

outside and has the power to visit a site inspect a site demand the details of the efforts being made to maintain a safe site.

So, these are all documents which have to be very meticulously recorded (Refer Time: 06:26) and produced in case of an inspection, suggest corrective measures within a reasonable time to bring hazard potentials to the notice of the employer or the company.

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Responsibilities of a safety officer Contd.....

- To bring hazard potentials to the notice of employer.
- To advise the workers for effective control of injuries.
- To advice on safety aspects and facilitate safety studies.
- To suggest measures for welfare amenities.
- To check and evaluate effectiveness of action.
- To advice on procurement of Personal Protective Equipment.
- To carry out safety inspections of building.
- To investigate all fatal and other selected accidents.
- To investigate the cases of occupational disease.

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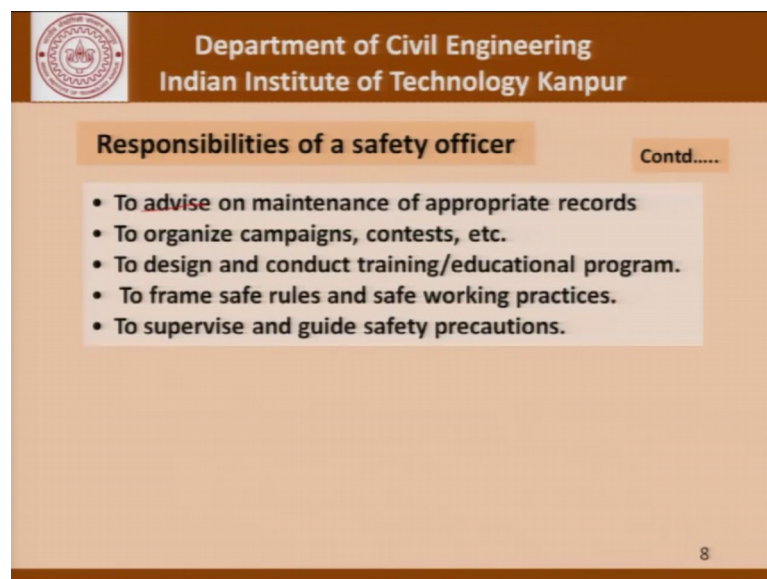
To advice the workers for effective control of injuries this could include first aid training in first aid and the safety officer is responsible for carrying out this training. He does not have to do it himself or she does not have to do it herself, but she can organize qualified professionals to administer the training. Advice on safety aspects and facilitate safety studies suggest measures for welfare amenities to check and evaluate effectiveness of action. This is something which is very important. It is not only necessary to take an action, but also ensure that is action is effective. Whatever it required to correct has actually been corrected. So, that is something which the safety officer has to ensure that whatever instructions were issued have been followed and they have become effective.


To advice on procurement of personal protective equipment. So, the procurement itself may be carried out by another department, but the safety officer is responsible for the specifications of the PPE which is involved at a particular site, it is timely procurement and disbursement to the workers to carry out safety inspections of buildings; obviously, that is a very important part to investigate all fatal and other selected accidents.

There has to be an investigation of almost all accidents all reportable accidents at sites. Whether they are reported up to one level or another is a different matter, but all accidents and near misses need to be investigated. So, that their recurrence is absolutely avoided an accident may be permitted once, but its recurrence can simply not be accepted because one is supposed to identify the cause for that accident and take corrective measure. In fact, I may also say that as far as investigations are concerned there should be always two parts investigation. One is to find out the responsibility of the person who may have erred who may have made an error in judgment, who may have neglected his duty and so on and so forth.

The second part of the investigation should always be corrective measures and recommendations So that the recurrence of that kind of an accident is avoided. To investigate any cases of occupational disease like I said the safety officer is not responsible only for accidents, but also for occupational diseases and occupational and other occupational hazards and if there any cases relating to that they also need to be investigated by a team headed by the safety officer or appointed by the safety officer. To promote the working of a safety committee, we will come to the constitution and the working of a safety committee it is objectives, but yes the safety officer is responsible for creation of that committee and ensure it is proper functioning.

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Responsibilities of a safety officer Contd.....

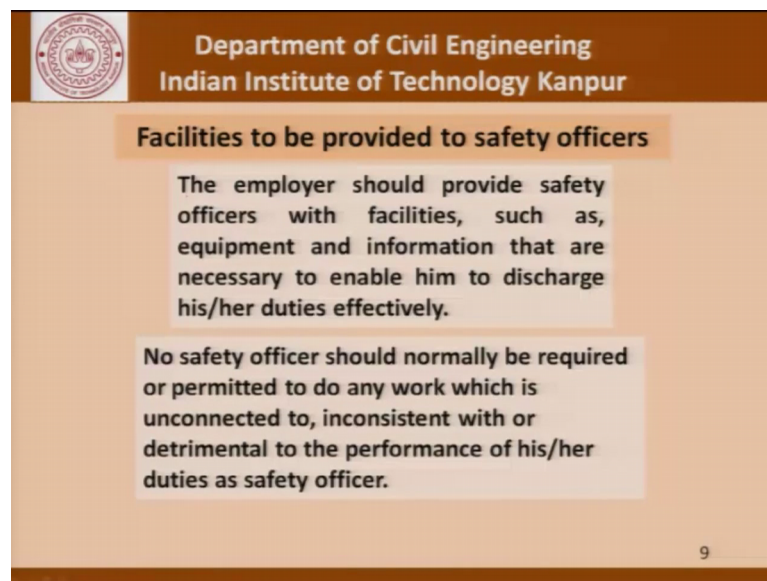
- To advise on maintenance of appropriate records
- To organize campaigns, contests, etc.
- To design and conduct training/educational program.
- To frame safe rules and safe working practices.
- To supervise and guide safety precautions.

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To advice on maintenance of appropriate records we have already talked of the need for keeping records and archiving the documentation, there could be issues relating to what kind of a support is required for procurement of let us say hard disks or any such devices or equipment for archival of such information. And that is why it is a matter of advising and it is imperative on part of the management to adhere or exceed to the request of the safety department to the extent possible.

To organize campaigns and contests to design and conduct training and educational programmes for workers for people nearby to frame safe rules and safe working practices within the framework prescribed by the regulatory bodies, and supervise and guide safety precautions. So, this is the list an exhaustive one I am sure of responsibilities for safety officer.

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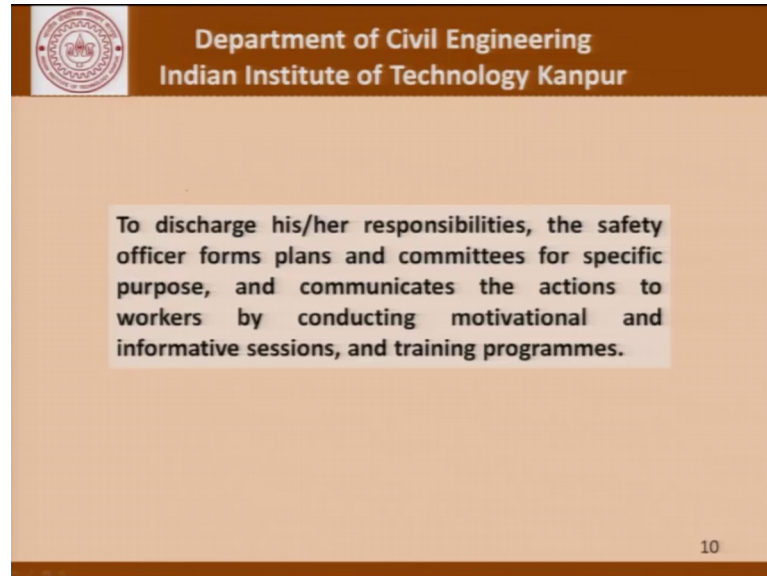


Now in order to be able to carry out these responsibilities what are the facilities that the safety officer should be provided with? The employer or the organization should provide safety officers with facilities such as equipment and information that may be necessary to enable him or him to discharge his or her duties effectively. And no safety officer should normally be required or permitted to do any work which is unconnected to inconsistent with or detrimental to the performance of his or her duties as a safety officer.

So, it is important that the employer appreciates that the fact that a safety officer is a full time occupation. He should not be asked to take care of other responsibilities at site to

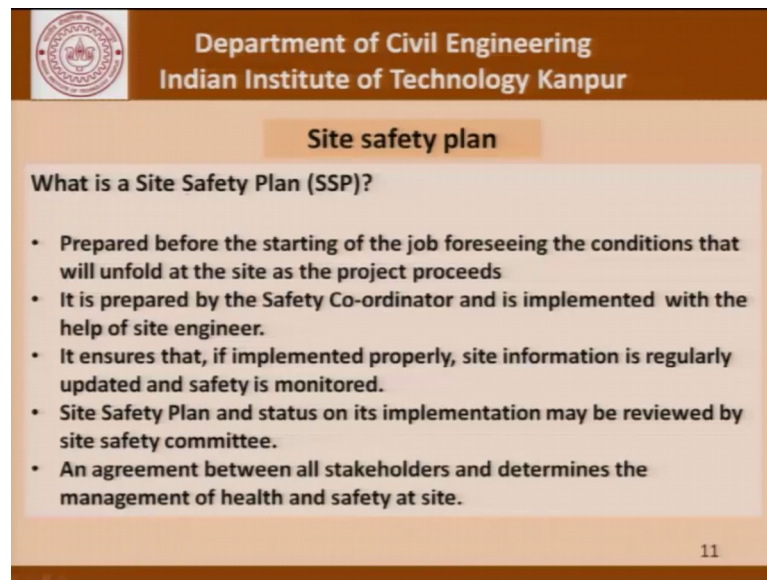
the extent possible. And in any case the primary responsibility of the safety officer remains ensuring compliance of safety standards and ensuring the safety at site.

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To discharge his or her responsibilities the safety officer forms plans and committees for specific purposes and communicates the actions to the workers by conducting motivational and informative sessions and training programmes. The safety officer cannot work as a mere individual. He needs the support of all the team members all the people in the execution team and also other people in order to be able to effectively communicate safety rules guidelines procedures to all the workers. And this he does through a plan and committees which are formed for a specific purposes.

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Site safety plan

What is a Site Safety Plan (SSP)?

- Prepared before the starting of the job foreseeing the conditions that will unfold at the site as the project proceeds
- It is prepared by the Safety Co-ordinator and is implemented with the help of site engineer.
- It ensures that, if implemented properly, site information is regularly updated and safety is monitored.
- Site Safety Plan and status on its implementation may be reviewed by site safety committee.
- An agreement between all stakeholders and determines the management of health and safety at site.

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As far as a site safety plan is concerned this plan is prepared before starting the job forcing the conditions that will unfold at the site as the project proceeds.

So, even before action really starts at a construction site, the safety team has to more or less foresee the kind of activities that will go on the kind of hazard it will pose and what kind of a safety plan will be needed. So, that safety plan is drawn up which includes identification of hospitals in the neighborhood, trying to get hold of ambulances which will be available for workers at different points in time.

The presence of a medical officer at site if it is required and so on, it is prepared by the safety coordinator and is implemented with the help of the site engineer. It ensures that if implemented properly the site information is regularly updated and safety is monitored, the site safety plan and status on it is implementation may be reviewed by the site safety committee. And this site safety committee is formed and is reconstituted periodically perhaps during the operation of the project. So, the site safety plan is a kind of an agreement between all stakeholders and determines the management of health and safety at site. So, this is a very important plan and outlines the framework and details of the entire safety procedures which will be followed at a particular site and given the diversity in construction sites this plan has to be specific to each site.

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Site safety plan

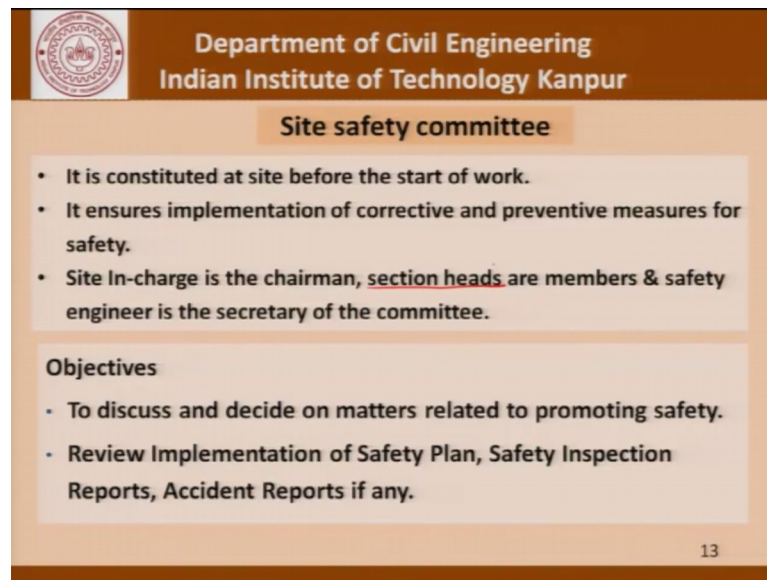
Objectives

- To determine broad parameters of safety management at site.
- Defines individual responsibilities at each level of the team for accident prevention and safety promotion.
- Identifies and manages any high risk operation and specifies integrated safety measures for mitigation.
- Reporting accidents and incidents.
- To outline training or supervision of employees
- Provides opportunities for employees to be involved in safety procedures

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The objectives of the safety plan would be to determine the broad parameters of safety management at site. Defines individual responsibilities at each level of the team for accident prevention and safety promotion; identifies and manages any high risk operation and specifies integrated safety measures for mitigation. Reporting accidents and incidents to outline training and supervision of employees. Provides opportunities for employees to be involved in safety procedures. So, these are the broad objectives of the site safety plan. Now coming to the site safety committee this committee is constituted at site before the start of work and ensures implementation of corrective and preventive measures for safety.

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Site safety committee

- It is constituted at site before the start of work.
- It ensures implementation of corrective and preventive measures for safety.
- Site In-charge is the chairman, section heads are members & safety engineer is the secretary of the committee.

Objectives

- To discuss and decide on matters related to promoting safety.
- Review Implementation of Safety Plan, Safety Inspection Reports, Accident Reports if any.

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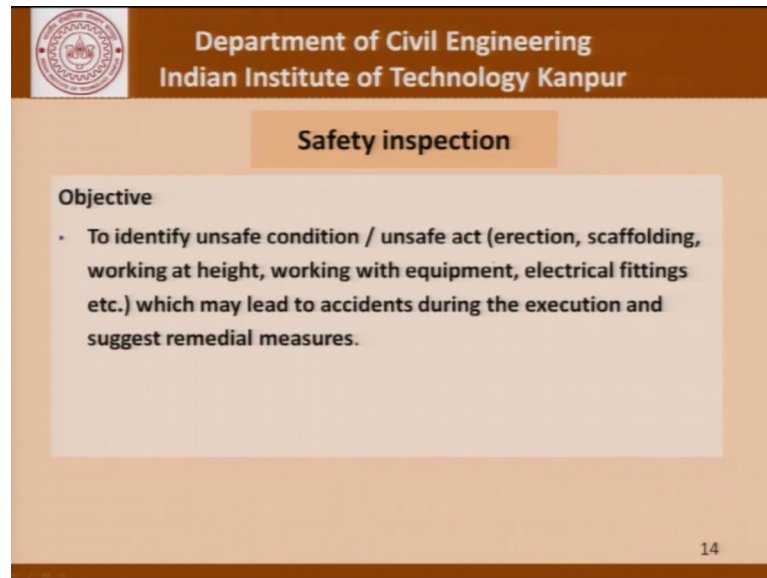
The site in charge is the chairman of this committee, the section heads are members and safety engineer is the secretary of the committee. Please remember that a construction site may have civil operations, electrical operations, mechanical operations, perhaps chemical operations and each of these operations will be headed by a section head and that is what we are talking of a section head.

There could be an administrative officer and accounts officer and so on with which will also have. There could be other sections operating at site it could be (Refer Time: 14:55) and procurement it could be administration and finance. And these section heads are members of the section committee. And these section heads are members of the site safety committee headed by the sitting charge. And the safety officer or safety engineer is the secretary of this committee. So, this ensures that decisions are taken by all concerned all stakeholders are part of the decision making process. And the safety officer is clearly in control of record keeping, setting the agenda and ensuring that all decisions are properly communicated and recorded.

The objectives of the site safety committee include discuss and decide on matters relating to promoting safety. And review implementation of the safety plan, safety inspection reports, accident reports if any. We must member that apart from the meetings of the site safety committee in project review committees as well very often the safety issues relating to a project have also to be taken up as a reporting item. The safety officer has to

submit a report to even the project reviewing teams and if there is anything that the safety officer raises those points have to be discussed first and resolved. That will show the commitment of an organization towards safety as far as safety inspections are concerned the objectives of safety inspections could be identify unsafe conditions and unsafe acts.

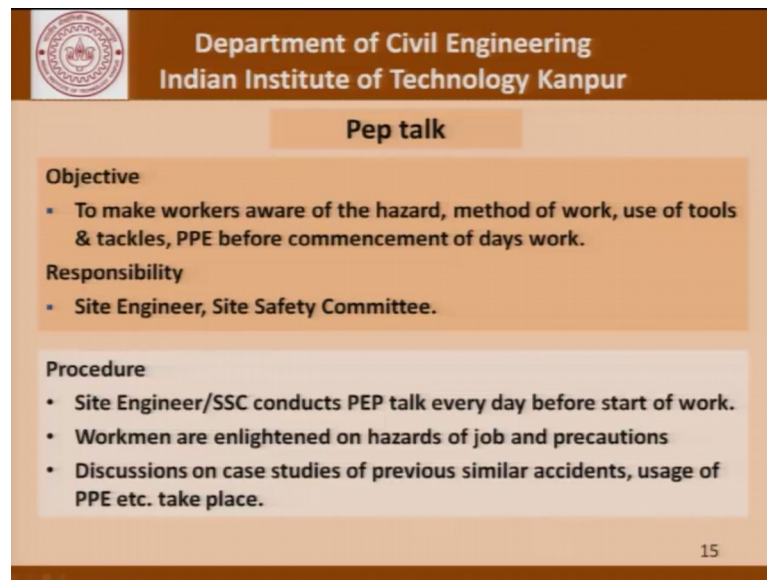
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In terms of erection of equipments scaffolding working at heights working with equipment electrical fittings, which may lead to accidents during the execution and suggest remedial measures. And the responsibility of this lies (Refer Time: 16:42) with the site engineers or the site safety engineer and safety committee members.

You will recall that we have talked about unsafe conditions and unsafe acts as the principle contributors to the cause of an accident. Unsafe acts are inadvertent acts performed by individuals leading to an accident whereas, unsafe conditions are those created by not necessarily the individual who is actually involved in that accident, but by someone else. So, in a manner of speaking the victim can be held responsible for performing an unsafe act, but the organization is responsible for having allowed the creation of an unsafe condition. A part of the safety teams exercise is to ensure that the organization ensures that no unsafe condition is created, and at the same time through training programmes ensure that no worker performs or commits an unsafe act.

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Pep talk

Objective

- To make workers aware of the hazard, method of work, use of tools & tackles, PPE before commencement of days work.

Responsibility

- Site Engineer, Site Safety Committee.

Procedure

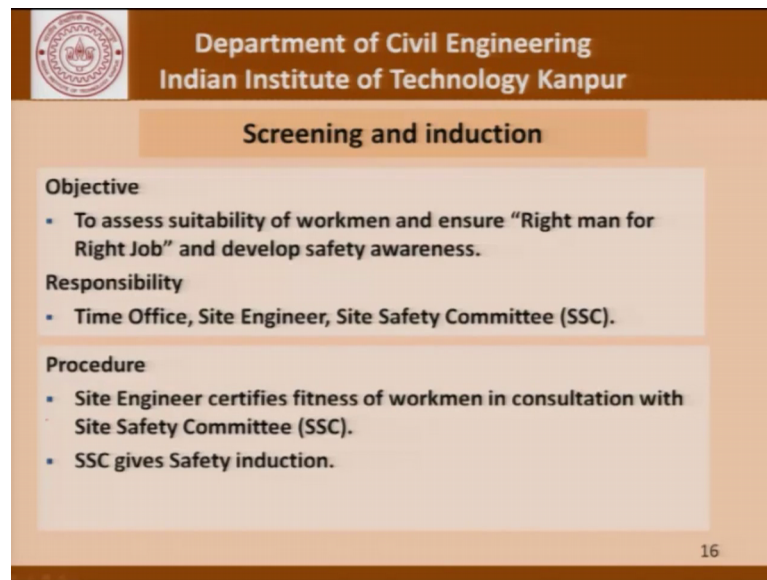
- Site Engineer/SSC conducts PEP talk every day before start of work.
- Workmen are enlightened on hazards of job and precautions
- Discussions on case studies of previous similar accidents, usage of PPE etc. take place.

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Now, this is partly ensured through what is called pep talks, which are done carried out with the objective of making the workers aware of the hazard, the methods of work use of tools and tackles PPE before commencement of days work. So, a pep talk has to be a part of the daily routine at a construction site, and the responsibility of holding the pep talks is also with the site engineer the site safety engineer and site safety committee.

And the procedure which may be adopted for this would include the site safety engineers or the site safety committee members conduct pep talks every day before the start of work. Workmen are enlightened on the hazards of the job and precautions, discussions on case studies of previous similar incidents usage of PPE take place in this meeting. Of course, sometimes in pep talks there would be a repetition as far as the message is concerned, but that repetition is absolutely important to get the message across that the organization means safety as a top priority. Screening and induction of workers is another important part As far as the safety officer's job is concerned.

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Screening and induction

Objective

- To assess suitability of workmen and ensure "Right man for Right Job" and develop safety awareness.

Responsibility

- Time Office, Site Engineer, Site Safety Committee (SSC).

Procedure

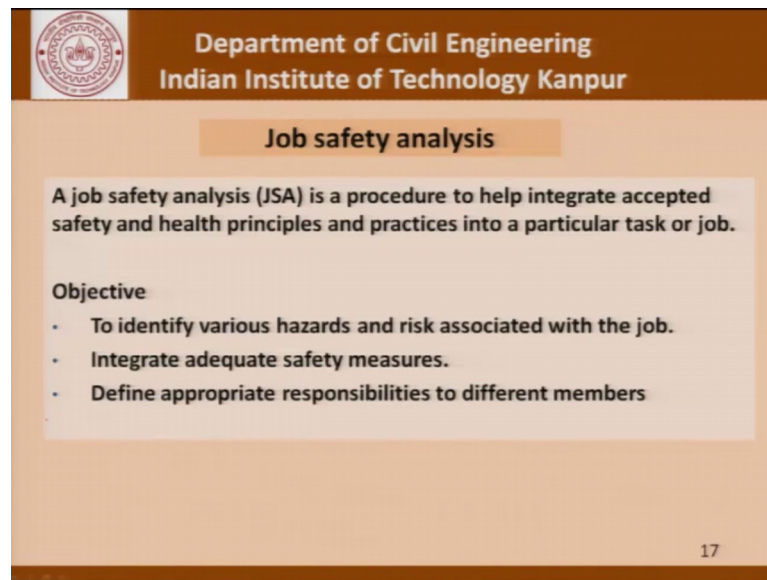
- Site Engineer certifies fitness of workmen in consultation with Site Safety Committee (SSC).
- SSC gives Safety induction.

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And the objective of this exercise is to assess the suitability of workmen and ensure right man for the right job and develop safety awareness among workers and this responsibility rests with the time office site engineer and the site safety committee once again. And the process for carrying this out is that the site engineer certifies fitness of workmen in consultation with the site safety committee. The SSC or the site safety committee gives safety induction which means that on the first day of the work of that particular workman, he is given an overview of the safety issues involved at a particular site by the SSC. And the time office coordinates and maintains the record of these briefings.

Now, let us talk about the job safety analysis which is a very important part again of the safety officer's job.

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Job safety analysis

A job safety analysis (JSA) is a procedure to help integrate accepted safety and health principles and practices into a particular task or job.

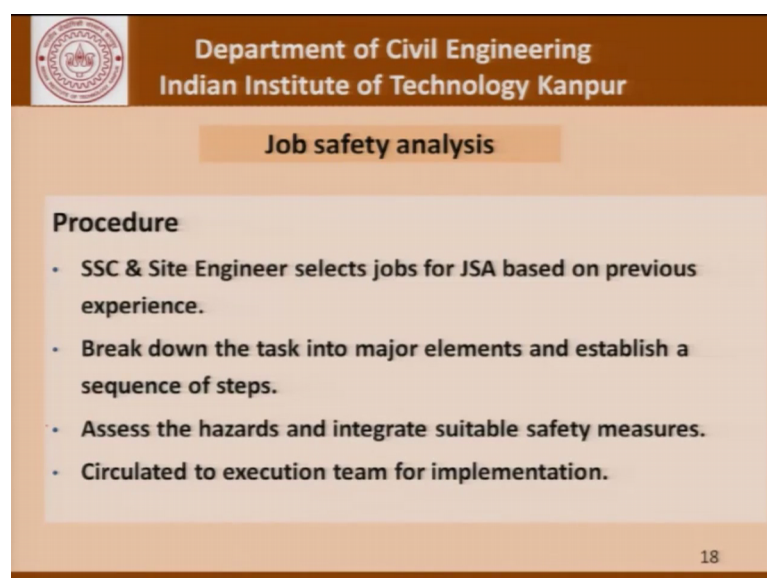
Objective

- To identify various hazards and risk associated with the job.
- Integrate adequate safety measures.
- Define appropriate responsibilities to different members

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A job safety analysis or JSA is a procedure to help integrate accepted safety and health principles and practices into a particular job or task. Given the diversity of jobs and task at a construction site it is important to understand that which job entails what kind of safety hazards and what kind of health principles apply. So, the job safety analysis does precisely that kind of a analysis for different jobs at a particular site. So, the objective of carrying this exercise out is to identify various hazards and risks associated with the particular job and integrate adequate safety measures and define appropriate responsibilities to the different members.

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The slide features a brown header with the IIT Kanpur logo and the text 'Department of Civil Engineering Indian Institute of Technology Kanpur'. Below the header, a yellow box contains the title 'Job safety analysis'. The main content area is white and lists a four-step procedure for JSA: selecting jobs, breaking down tasks, assessing hazards, and circulating to the execution team.

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Job safety analysis

Procedure

- SSC & Site Engineer selects jobs for JSA based on previous experience.
- Break down the task into major elements and establish a sequence of steps.
- Assess the hazards and integrate suitable safety measures.
- Circulated to execution team for implementation.

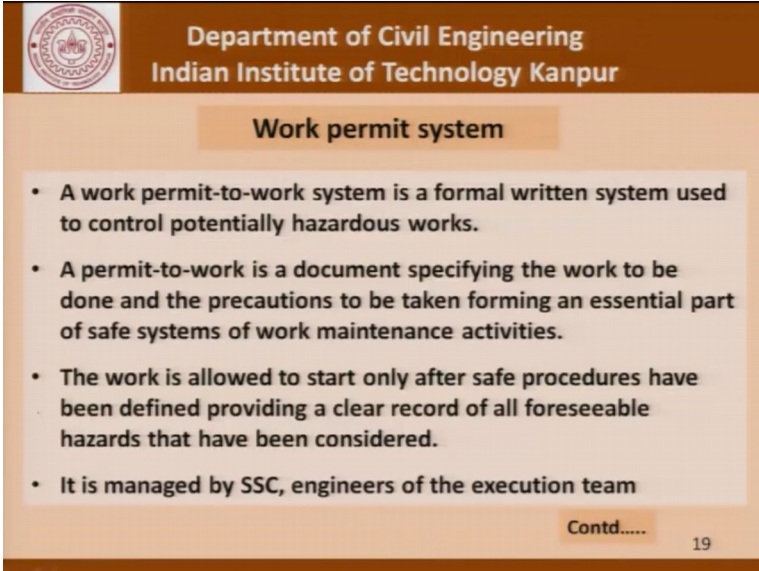
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Continuing With this discussion on job safety analysis, procedure for doing this is that the SSC or the site safety committee and site engineer selects jobs for JSA based on previous experience. Not necessarily all jobs will be very critical and given the nature of things, it is important that some of them are identified and listed based on past experience.

Break down the tasks into major elements and establish a sequence of steps. Or an SOP assess the hazards and integrate suitable safety measures, and this is circulated to the execution team for implementation. Of course, the implementation team members are part of the SSC and therefore, it is not that the site safety engineer or the officer carries out this exercise in isolation and tells the execution team this is what you have to do. They are all part of the same team and they decide that this is doable this is going to be done and that is when it is communicated to the execution team to implement.

Now, a very important part which we have often talked about especially when we are talking of the accidents at the construction sites is the work permit system.

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Work permit system

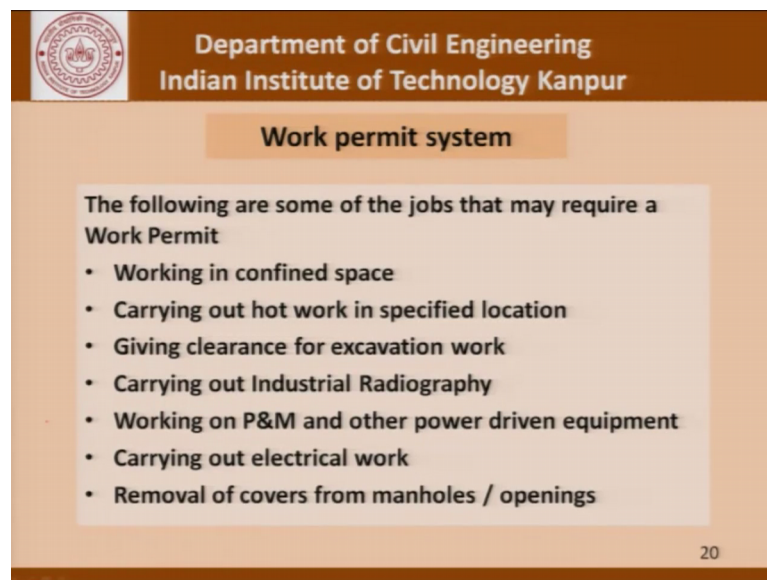
- A work permit-to-work system is a formal written system used to control potentially hazardous works.
- A permit-to-work is a document specifying the work to be done and the precautions to be taken forming an essential part of safe systems of work maintenance activities.
- The work is allowed to start only after safe procedures have been defined providing a clear record of all foreseeable hazards that have been considered.
- It is managed by SSC, engineers of the execution team

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Now, what is this work permit system? A work permit is a permit to work system in a formal way and used to control potentially hazardous works at site. A permit to work is a document specifying the work to be done and the precautions to be taken forming an essential part of the safe systems of work maintenance activities at site. The work is allowed to start only after the safe procedures have been defined providing a clear record

of all foreseeable hazards that have been considered and it is managed by the SSC engineers of the execution team we will recall that we have talked about the necessity or the requirement of having a work permit when we were talking about working in confined spaces.

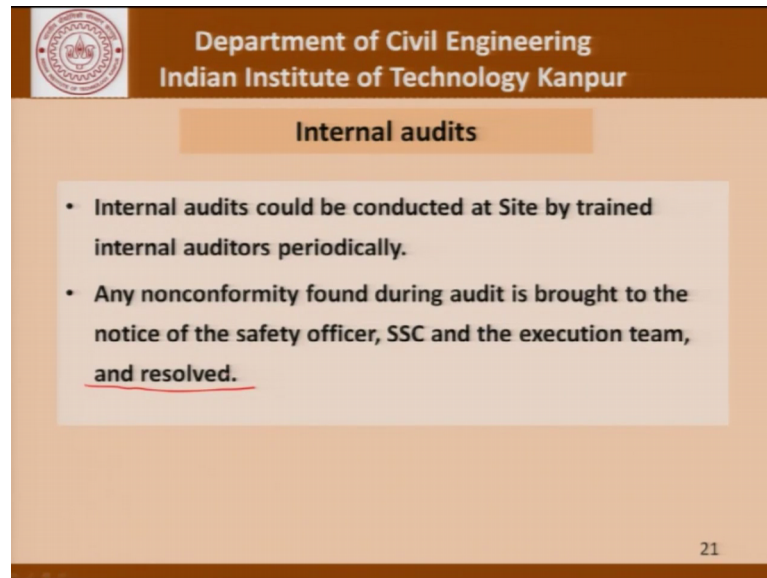
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Carrying out hot work in specified locations. Giving clearances for excavation work. Industrial radiography, working on P&M and other power driven equipment carrying out electrical works, and removal of covers from manholes and openings.

This list is of course, not exhaustive and there could be other areas other activities at site which would require a work permit. And that is something which the SSC foresees and prescribes in the procedures to be followed at the site for safe operations.

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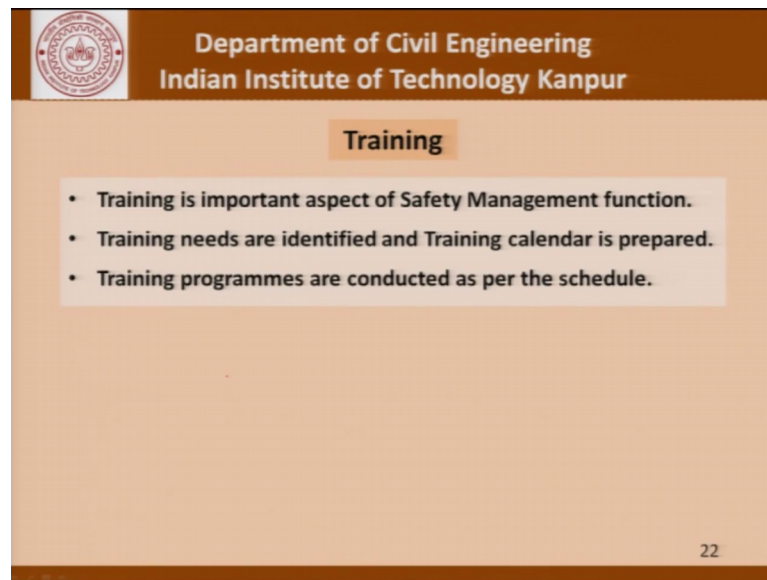
Internal audits

- Internal audits could be conducted at Site by trained internal auditors periodically.
- Any nonconformity found during audit is brought to the notice of the safety officer, SSC and the execution team, and resolved.

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Now, coming to internal audits. Now internal audits could be conducted at site by trained internal auditors of the organization periodically. Now this audits are being conducted by not the safety officer, but an external team. Any non conformity found during an audit is brought to the notice the safety officer the SSC and the execution team and resolved. So, this resolution is a very important part of handling an internal audit. You can easily see that this system is equally valid for accounts it is equally valid for quality. So, there is this process by which the execution team does something somebody else does the control and then somebody from outside comes and inspects that records periodically maybe without notice and it is important that they are all found in order.

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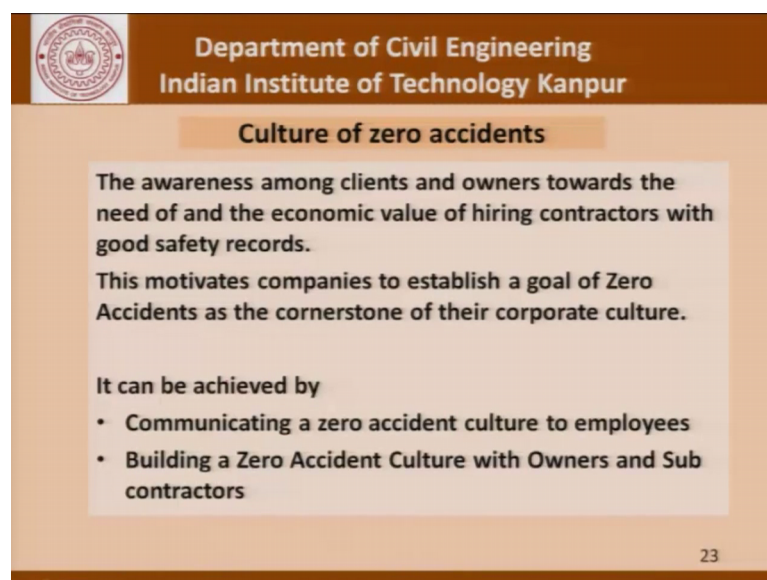
Training

- Training is important aspect of Safety Management function.
- Training needs are identified and Training calendar is prepared.
- Training programmes are conducted as per the schedule.

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Coming to training it is an important aspect of the safety management function. And training needs are identified and training calendar is prepared So that the execution team can spare the right kind of manpower which requires the training at different points in time. And the training programmes need to be conducted as per a pre announced schedule.

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Culture of zero accidents

The awareness among clients and owners towards the need of and the economic value of hiring contractors with good safety records.

This motivates companies to establish a goal of Zero Accidents as the cornerstone of their corporate culture.

It can be achieved by

- Communicating a zero accident culture to employees
- Building a Zero Accident Culture with Owners and Sub contractors

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Coming to the culture of zero accidents this is an important and efficient statement kind of thing made by the organization. The organization says we do not want accidents, zero

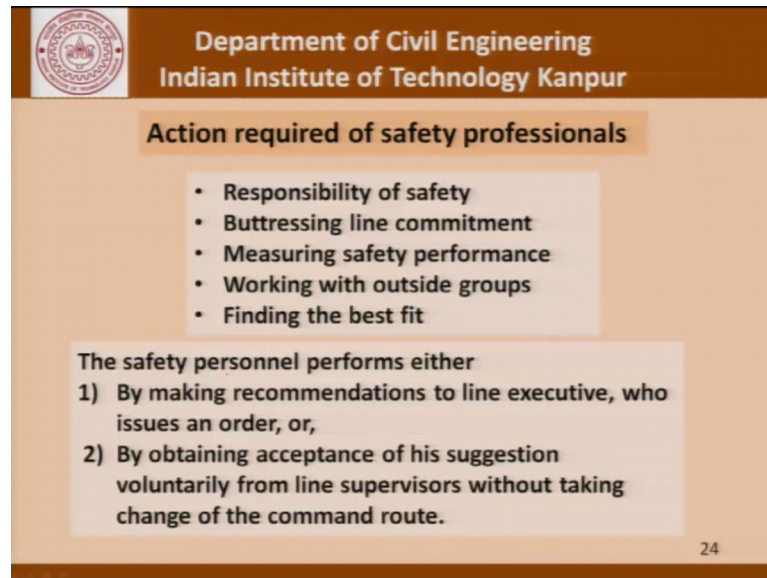
tolerance. And if this culture has to be communicated it has to be imbibed by the people in the organization. It is the responsible of the safety officer and the safety team.

The awareness among clients and owners towards the need of and the economic value of hiring contractors with good safety records is gradually increasing. So, people are becoming aware that it is important that contractors with a better safety record or a good safety record only those contractors be hired to carry out certain works. Now this motivates companies to establish a goal of zero accidents as the corner stone of their corporate culture and policy. And this can be achieved by communicating a zero accident culture to employees. So, the employees must know that the organization will not accept or tolerate an accident.

Building a zero accident culture with owners and sub contractors. We will talk about sub contractor management at some point in time later on, but please remember that the contractor or an organization does not necessarily carry out all the jobs at a construction site itself or through it is own employees. It does hire some specialized agencies at times to carry out certain jobs.

Now it cannot be said that this accident was not caused by us, but a sub contractor. Acts of omission and commission of the sub contractor are very much a part of the responsibility of the safety officer of the main contractor. We must also remember that at the end of it the client is very often designated as the principle employer of all workers working at site whether it is a contractor whether it is a sub contractor. And those are legal issues there may be legal differences there will be lawyers who will split (Refer Time: 25:57) over some of these things and we try to talk about some of the issues when we talk about legal aspects relating to construction, but the principle of it the spirit of it is that not only the contractors employees, but all sub contractor employees as well, should be aware of the culture and the expectation that it is zero accident no tolerance construction site.

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The slide is a presentation slide from the Department of Civil Engineering at the Indian Institute of Technology Kanpur. It features a brown header with the department name and the IIT Kanpur logo. The main content is on a light orange background. A title box lists five actions required of safety professionals. Below this, a text box explains the two ways safety personnel perform their duties. The slide number '24' is in the bottom right corner.

**Department of Civil Engineering
Indian Institute of Technology Kanpur**

Action required of safety professionals

- Responsibility of safety
- Buttreassing line commitment
- Measuring safety performance
- Working with outside groups
- Finding the best fit

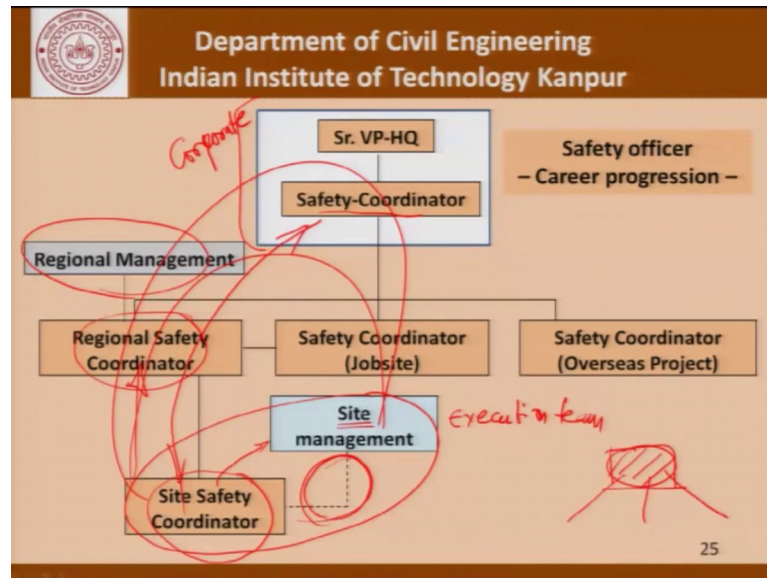
The safety personnel performs either

- 1) By making recommendations to line executive, who issues an order, or,
- 2) By obtaining acceptance of his suggestion voluntarily from line supervisors without taking change of the command route.

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Now, coming to the action required of safety professionals. They are responsible for safety, buttressing the line commitment line commitment means the commitment of people who are directly in the line of operations. Measuring safety performance, working with outside groups and finding the best fit. The safety personnel performs it is duties by making recommendations to the line executive who issues an order or by obtaining acceptance of his suggestion voluntary from line supervisors without taking a change in the command route. This slide In fact, brings me to a very interesting aspect of the job of a safety officer. If we look at this picture here, this is a basic diagram or A model as to how a safety coordinator or the site safety engineer works.

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And how his career progresses as he spends more time gains more experience and becomes more knowledgeable as far as safety issues are concerned, this safety coordinator at site is part of the site management team. So, there are people at site who we are calling as the execution team. And the safety officer is just outside the execution team advising this execution team and making sure that his advices adhere too.

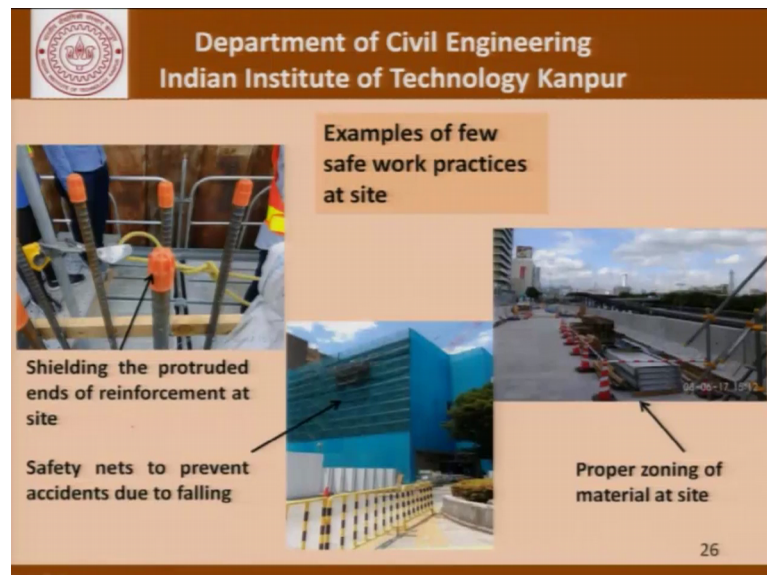
So, as far as administrative things are concerned whether their safety officer will go on leave not go on leave what kind of privileges are due to him and not due to him, for that purpose there is a dotted line that connects him to the site management; however, as far as the safety officers performance is concerned whether he is doing a good job or a bad job, the regional management which sits above the site management a regional management in a region there could be several sites. So, this regional management as has it is own safety setup. And this regional safety coordinator he is actually responsible to evaluate the performance of the site safety engineer or the site safety coordinator.

So, beyond this there is this corporate office where there could be the wise president or whatever it is and the safe coordinator, sitting at that level trying to handle different regions. So, the safety officer basically has this as his main chain of command. And this ducted line is only an administrative control. So, this is how the safety officer maintains an independent status as far as his ability to take a decision or communicated decision is concerned. So, the decision making by the safety officer is; obviously, related to the site

activities and it is communicated to the site management. And it is the responsibility of the site management ensure that what the safety officer is saying is implemented. And that is what was said in the previous slide were we talked about the safety officer either asking the site management to implement certain things and if those things are done then that is fine. If not the safety officer can always go this route. And make an appeal that his request or his demands be met by the site management. And then it could go either this route or it could go this route.

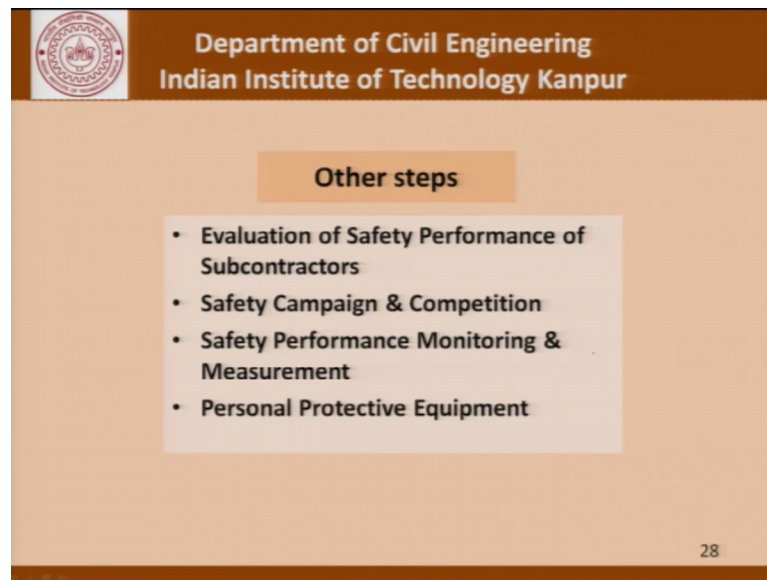
Now, before we conclude let us just see a few examples of safe work practices at site.

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And also see the management of safety in terms of reward and reprimand systems which could be adopted by different organizations.

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There could be a safety trophy scheme; there could be a merit certificate for achieving a milestone for example, of million hours work without an accident. Merit certificate for achieving zero accident rates zero accidents during any particular period it could be year, safety norm violation memos. So, this is the carrot and this is the stick. Other steps would include evaluation of safety performance of subcontractors. Safety campaign and competitions, safety performance monitoring and measurement and personnel protective equipment.

So, with this we come to a close of the discussion relating to the safety organization roles and responsibilities of a safety officer, and how organizations through their safety department implement safety policies safety regulations at construction sites. So, these references I am sure will help you understand some of the subjects better and I will look forward to see you once again.

Thank you.