

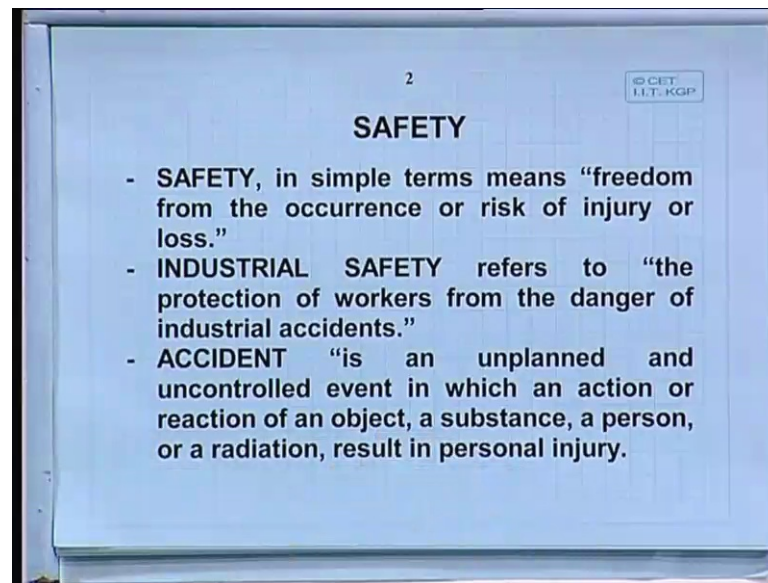
**Human Resource Management - 1**  
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**Lecture No. # 11**  
**Safety, Health, Environment**

Today's topic is Safety, Health and also Environment. As I explained I think in the last lecture, nowadays safety and health if you look after within your organization is not enough, because you exist within an environment, within a community. So, therefore, important for organizations to also have the awareness that they cannot do anything which is dangerous or unpleasant for the community in which they exist.

So, environment therefore, has importance nowadays not only for organizations, but for the whole world, even for nations it has become very important because we are all inhabitants of one planet mother earth and whatever we do collectively as nations also, that affects over a long period of time, the very health of the planet and if that is threatened then of course, the people living on the planet, their health and safety is also threatened. So, the environment is very important and it has assumed great importance now. So, as managers managing the human resource, we have to be very careful of what we do, which does not at all in any way effect adversely the environment in which we are operating, so that also is added.

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So, everyone knows what is the definition of safety, but very simply safety means, freedom from the occurrence or risk of injury or loss. Either occurrence or the risk there off, there should be no risk that it should occur and specifically industrial safety refers to the protection of workers from the danger of industrial accidents because as you know the environment within a factory, within an industrial undertaking is fraught with many dangers, because you have machinery which is working in chemical plants, you have various processes which are going on, which are generating may be toxic or poisonous substances and fumes.

Then there are many movements of materials and goods which are happening within an environment. So, all these pose dangers in the industrial setting, there is also the question of how each workman is doing their work because if you are working on a machine, you are using tools; so, every tool that you use is very beneficial in one way, but if not used in a proper manner or if the method of work is not done properly, it can possess a potential hazard. That is in everything is it not, say a automobile is a very nice invention because it makes it possible for people to move from place to place quickly in comfort, but imagine is a powered vehicle and if you are driving an automobile and if you are not careful, you can pose very lethal hazards not only to yourself, but also to others. So, any tool, any discovery, any invention, modern invention is very good on the one hand, but on the other hand, unless it is used in a proper manner and a proper method or in other words if it is abused, then it can pose of danger to people and the environment.

So, therefore, accident is an unplanned and uncontrolled event in which our action or reaction of an object, a substance or person or a radiation results in personal injury. It may be personal injury; it may be personnel injury also, to many people that injury may happen.

Have you heard of this terrible accident which happens in Bhopal? All of you have heard it has become known all over the world and why was it terrible? Yeah, because of the very numbers you know, the sheer numbers of course, there have been occasions in human history, where due to some incident more people have perished no doubt, but for industrial accidents within a factory, small factory an accident occurring and killing. So, many people in the neighborhood the community and the surroundings. When it happened, it was the biggest disaster which happened in terms of an industrial accident and what really happened.

Here it says, accident is an unplanned and uncontrolled event in which our action or reaction of an object, a substance, a person or a radiation results in personal injury. So, here it was uncontrolled was it not, what happened? Potassium isocyanide it leaked out isn't it? It leaked out, that means, it was uncontrolled they could not control it and I do not know if it was an unplanned and there has been several enquires which have been made and reports have been given and so on, that is all history.

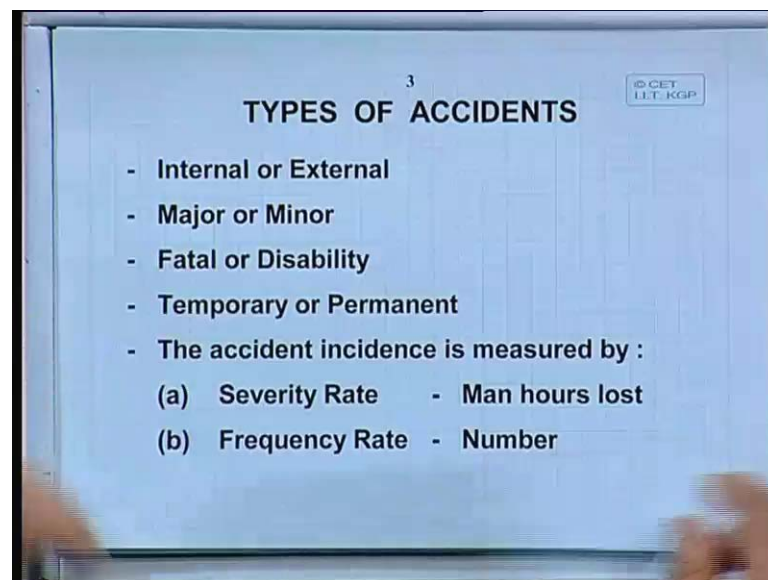
The fact remains that possibly it could have been planned better; it could have been controlled and need not have resulted in this huge human loss and tragedy. So, accidents they say never happen, you know we say accidents are happened. So, there are saying in industries that accidents do not happen; they are caused, that means, someone is causing it either by doing things which are not correct or by not doing things which are correct, both are equally important, say any questions?

So, in an industry, why is it important that management should prevent accidents? Is it only because of the human perspective that is you do not want your workman to be injured and suffered or is there any other perspectives? Yes, you are the management member; you obviously, do not like your own workman or employees to be injured. Because, it is a human tragedy, human loss, the family also suffers, but is there any other perspective, why it is important for you to see that your workmen are not injured.

Financial loss

Financial loss, yes very clear, is it not because if there is an accident, the person cannot come for work, if he cannot come for work either the work will suffer or you have to employ another person casually, all right. And pay him his salary wages over and above the salary and wages which you are going to pay to the regular workman and then there are other statutory provisions, if it can be proved that it was due to some mistake on the part of the management, then some compensation has to be given, some benefits have to be given, so all these result in financial loss. So, that is loss financially which is direct that is the money which you have to give and indirect, that is the loss of productivity and the disruption in the operations, which also leads to indirectly a financial loss that is why it is important you look at accidents, not only because of the human angle, but also for economic reasons.

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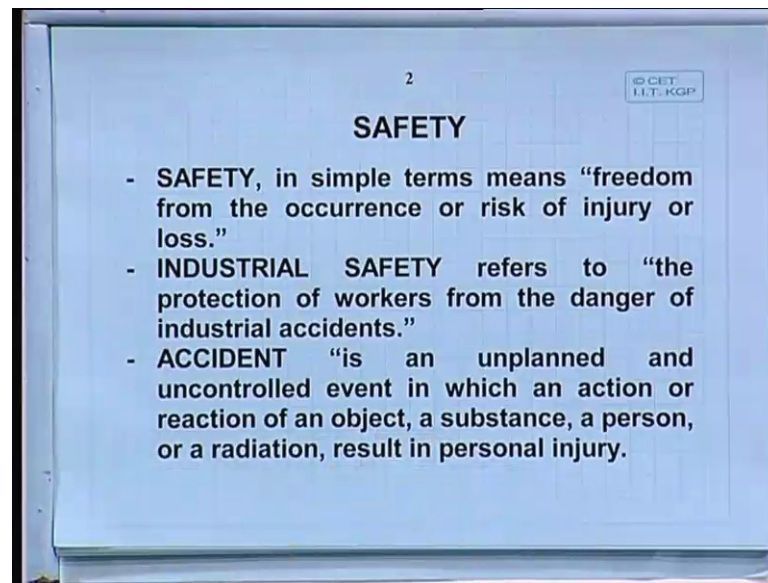
Now, types of accidents you can classify in many ways, but you know there are statutes which also do some classification. So, internal or external accident, major or minor, fatal or disability, fatal means the person dies and disability means that there is some temporary or permanent, disability means they are not able to do some work. So, some injuries they are to the shoulder and it may take three or four months for the shoulder injury to heal, then he has a disability not temporarily, not to be able to do work which requires physical strength, lifting for instance. So, you have to give him lighter work if he is in some department, which involves lifting of loads, you may have to transfer him temporarily.

And then there is permanent disability say a press operator working in a press, he has a loss of a thumb or a finger, part of it because of an accident first operating the press, then it becomes a permanent disability. So, you cannot restore that body part and therefore, there is some compensation to be given and also he has to be given some other work probably, he cannot continue to do the same work, he may have to be retrained to do another work.

So, accident and incidence is measured by two ways; this is the standard measurement which we do, one is the severity rate and the frequency rate. So, severity rate means, you try to assess how severe is the accident, is it just a small scratch which has happened on the finger or is it something which entails loss of working hours that is you have to give him leave and he has to be at home. If it just a simple scratch, then you can give him first aid he can continue to work, but if it is something which is little more a fracture let us say, then you have to give him time off, so there is loss of work, so these are the classifications.

Severity, how severe is it and how that is measured? In terms of man hour lost, so more man hour lost at work the more severe it is, that is the unit of measurement that we use and then the next accepted measurement is frequency rate. So, in your factory if I were to judge, how safe your factory environment is, I will see how severe are the accidents which are happening and also how many are happening within the same period. So, severity rate and frequency rate are the two indicators, which give you an idea of how safe the factory environment is, any questions?

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We have briefly discussed just now the need for safety, economic need and the human need. Now, here we see some of the economic needs are highlighted; one is of course, cost saving, if you have safe working condition and no accidents, then we say productivity increase and then what we did not say is morale increase. Morale is, the state of mind of the people and the employees working within the environment. If very frequently, they see their fellow workers or colleagues meeting with accidents getting injured, their morale is likely to go down isn't it, because they think that today it has happened to my friend, tomorrow it may happen to me, conditions are not safe here people get frightened, they get disturbed and distressed. So, the moral goes down and if moral goes down automatically their ability to perform as well as they can also goes below par and therefore, the productivity suffers.

Then image increase, what does this mean? It means that in your factory if you can claim and say you have had accident free. Five years your factory has been accident free, does it not raise the image of your factory and also the company and the employer, that this is the employer where the working is very safe. So, it is one of the factors which increase the image of the organization.

Avoid statutory action as I say there are laws, there are statues, which you have to comply with. If you do not comply with the provision of law, then the enforcement agencies in this case, the factory inspectorate. The factory inspectors will come and they

will institute action, legal action against you as per the act. So, the company will be liable for legal action and of course, if found guilty then they have to give compensation, there will be punishments which will be given, so if you have safe working condition you avoid that.

Avoid unique action, what does unique action mean? Anything all right, which is directed towards you as an organization, which that is what making it unique. Bhopal tragedy what we talked about? It resulted in a number of laws and amendments which happen and in the process what happened to union carbide? Their image was spoilt the company has suffered a huge loss, they had to pay compensation. So, unique action is whatever stands out and is unique to you, avoid such an action because that is not good for you.

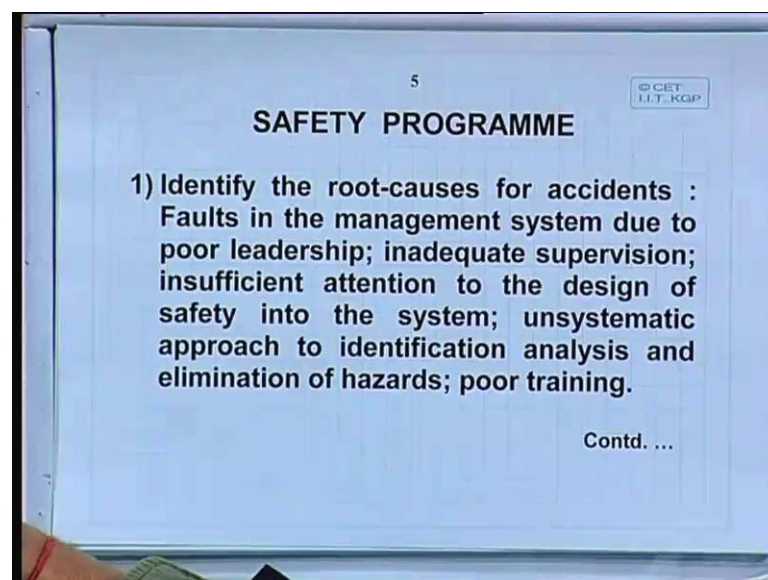
Say Bhopal, if there was no gas leak and there were no death. This became a unique, unique means, one all right, which is not repeated by others. If there were gas leaks all the time, for instance you have so many tankers, which ply Indian road they fall into a thud you know, there an accident. Some oil spills **you know** or gas leaks, small gas you find it in the news paper, but it is. So, frequent that you cannot call it unique, but unique in the sense, the Bhopal gas is unique because no other accidents have been of this nature. So, if this happens or in a let us say you are running a power plant, where it is an atomic power plant. So, if we have a kind of meltdown or accidents or a radiation leak, it becomes very unique then, because it does not happen all the time and then action will be taken. So, as a management you have to be very careful that we avoid such actions, which pinpoint you as an organization and a company as something which is unique and in this sense, unique in the bad connotation because we are talking of accidents here and ethical management.

What does ethical management? Just go to the Bhopal case again how would you say? Would you say, how you relate this term ethical management in terms of safety and health? If the Bhopal incident instead of looking for profit what does it translate down to, let us be specific, investment. So, if you make more investment in safety measures, then you are likely to depress your profit. So, it would be termed unethical, that even if the absolute minimum as specified standards that is not done in terms of investments to see that safe, health, environment is maintained.

So, pollution control, pollution control is it not the legislation which look at that, that you have to for instance any chemical plant, your are producing effluence any other plant also they produce effluence, chemical plants they produce gases all right, which are toxic. So, you have to make investments in equipment **all right** to see that these are neutralize, they have to be further reaction which take place, they neutralize it. So, all these cost a lot of money and if you are setting up a project, it increases your project cost, if it increases your project cost, then it increases your payback period is not it, so it depresses profit. So, if you do not do it knowing full well that you are not complying with the very minimum statutory condition then, obviously it is unethical. So, ethical management is very important, it is one of the pillars on which safety, health and environment will stand.

Nowadays, lot of thought is being given to the environment, you have got several themes in terms of movies etcetera which come, which talk of companies, big giant companies you know, they are not paying attention to the environment and the health of people and that is being portrayed as unethical, because they are doing it not because of lack of knowledge, they are doing it knowing that if you do it this way, you will make more profit,, but also that some people health will be spoiled, that is what makes it unethical.

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So, all companies you have to have certain safety programmers, it is not that you just say, by giving a circular that, our intention is to have safe and healthy working



conditions here and we very much uphold the safety of the environment. That is not enough, just to give an expression intention, but we have to translate those intentions and that philosophy of the management into a set of working programmes. So, programme is identify the root causes of accidents depending on whatever business you are in, the kind of factory you are in, if you are in a plant which is a deploying mainly machinery all right and you are making items which are heavy items. So, may be what you have in your factory is machines which may be of various types, your material handling, that is movement of machine parts, a movement of job parts, so you may have cranes, so you move heavy weights.

So, there is a potential danger in moving weights by crane, isn't it, you have to sling it. If you do not have proper maintenance of the slings, the rope may break, it may fall on someone. You may have some plating shops, where you are generating effluence and some toxic gases also. So, these you have to assess in your own factory, in your industry, what are the route process which may cause accidents? Falls in the management systems due to poor leadership, inadequate supervision, insufficient attention to the design of safety into the system and systematic approach to identification, analysis and elimination of hazards and poor training, we have a term call fail safe, have you heard of that fail safe? Fail safe means, even if a machine fails at least it will fail safely so that the least injury is done to people, so that is called the fail safe. So, fail safe is a feature which you can build into the design itself.

For instance, if you have an elevator, you can design an elevator, so that even if the rope breaks, there are some measures where it softens the fall that can be built into it. There can be some electronic or electrical device which applies a break as soon as there is an acceleration, which exceeds a certain limit. So, these are fail safe features which can be built into the design, so insufficient attention to the design of safety into the system.

Earlier the concept of safety was that, whenever you are within the factory you look at safety, then the concept they it extended to the environment, but now, you know you have the concept where a manufacturer all right is responsible for the safety of the equipment or product right up to the time when it goes to the consumer, otherwise there can be litigation against you. So, you are a maker of toys, making toys in your factory where you make the toys, you have excellent condition, you have never had accidents or very seldom, the severity rate of accident is very low, frequency rate is very low, and so,

you feel here very safe. But maybe you are using a kind of paint in making the toys, say you are making wooden toys and when it is sold to the ultimate customer and children are playing with it. Children have a habit of putting things in their mouth, they put that doll let us say into the mouth and some of the paint has toxic element, mercury or something and the child is injured, and then it comes back to you as a manufacturer, so the concept has now extended beyond your own factory.

So, these are the some of the connotations of safety, which you are to take care in the design itself, that is why you will find that there are in the products, you have leaflets **you know** when you buy these products giving the instruction manual. Why are they giving the instruction manual? Because, they may be open to the charge if it goes for litigation, that you did not give proper instruction for the use of this, what you are making, that is why the person is injured. So, it is going beyond the factory you have to remember that, any questions?

Poor training **you know** training will come all the time, safety is one subject where you have to train and retrain **train and retrain** because human memory short and safety is not a day to day item when you are working in the organization, there are many other important and urgent items for you. You have got your targets; you have to complete the work in so and so time, so usually the safety aspect is the backseat people cut corners as they say, they take short cuts and some of these shortcuts that you take are very unsafe shortcuts.

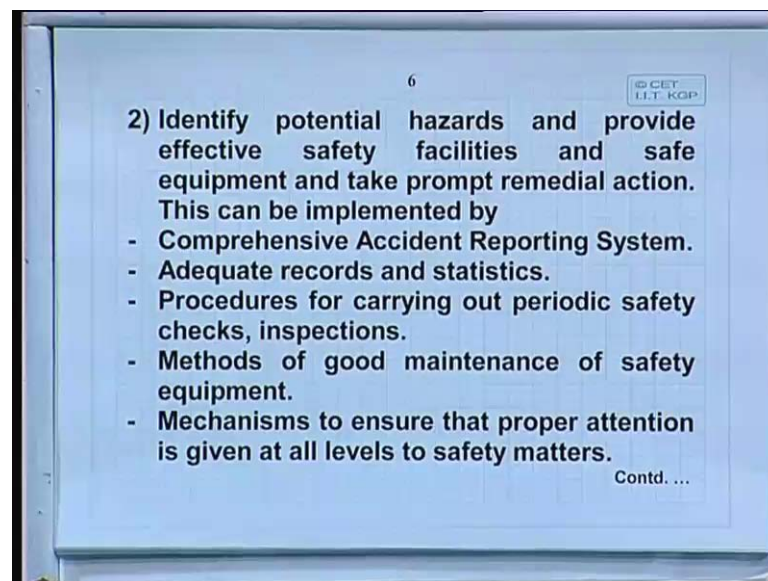
When you are driving a vehicle, what is the shortcut? Shortcut conceptually over speeding, I call is a shortcut. You are going by the same road,, but exceeding safety limits of speed; that means, you want to go faster than you should be going, trying to take a shortcut. So, shortcuts always lead to accidents and one tends to take shortcut why? Because, unfortunately, safety is something which is passive in a sense, you feel secure till god forbid something happens and when that is happen once maybe in 10 years it happens, but because it is dormant, it is not there all the time **all the time**. You become dulled to it, your senses become dull, and you do not think that there is no point in doing.

Have you seen people running jump into running trains or running busses, isn't it very unsafe, all of us know it, why do they do it? Because the injury comes to a person may

be once in a lifetime, but when it comes it may lead to amputation of a limb. So, the whole philosophy you see now you are understanding of safety is that, you must inbuilt it into the collective system of your organization and how does that happen? You have to train people to understand that, safety is something which is latent, dormant, and is lurking there, any time it can come and strike you unless you follow certain safe working methods and safe conditions.

It is something like, electric power, steam power, you can see huffing and puffing a steam engine isn't it or rotating machinery, mechanical power, you can see it moving you know it is dangerous. Electrical it looks so innocent **right**, but if you touch it what happens? So, safety is something like that, they are there always, unless you follow the rules it will hit you and because it does not happen very often, you get lulled into a sense of false security, that is why we say accidents all right. They do not happen; they are caused either by doing something which is wrong or not doing something which is right, any questions?

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So, coming back to our organization where we work, identify potential hazards, so it is a systematic approach that you have to take. You have to make it like a project, you have to identify, the safety department must be there, safety engineers must be there, you have to hire him, he has to identify that what is his work and provide effective safety facilities and safe equipment and take prompt remedial action. Providing of the equipment, the

cost you incurred in that you have to provide a budget that is the management's job, you cannot cut corners and say look it is not essential things, so we would not give this budget; you have to give the budget, otherwise it is unethical this can be implemented by comprehensive accident reporting system. Now, obviously, that is to be done isn't it because if accidents happen and the management does not even know that it has happened and then it will keep on deteriorating is it not? So, the first thing is, do you have a system to systematically report an accident that will happen, so that is the first.

Adequate records and statistics, otherwise how do you say what has been your severity rate or your frequency rate, how do you measure? How safe it has been last year, has it deteriorated this year or it has improved this year. So, you have to keep statistics and records, procedures for carrying out periodic safety checks and inspections. So, if you are running cranes, you are moving heavy loads by cranes, you have to have periodic inspections of the slings to see whether the wire ropes are getting (()) you have **to have** periodic inspections **All right** of firefighting equipment, you have got safety for firefighting, safety you have got fire extinguishers, you have to see when they have to be recharged in the frequency as has been recommended by the manufacturers.

So, if you do not do it, you keep it for five years it may dry up inside. So, when there is a fire it does not work, so inspection is very much to be built in into the safety programmed and checks. Methods of good maintenance of safety equipment part of the inspection and follow the inspection.

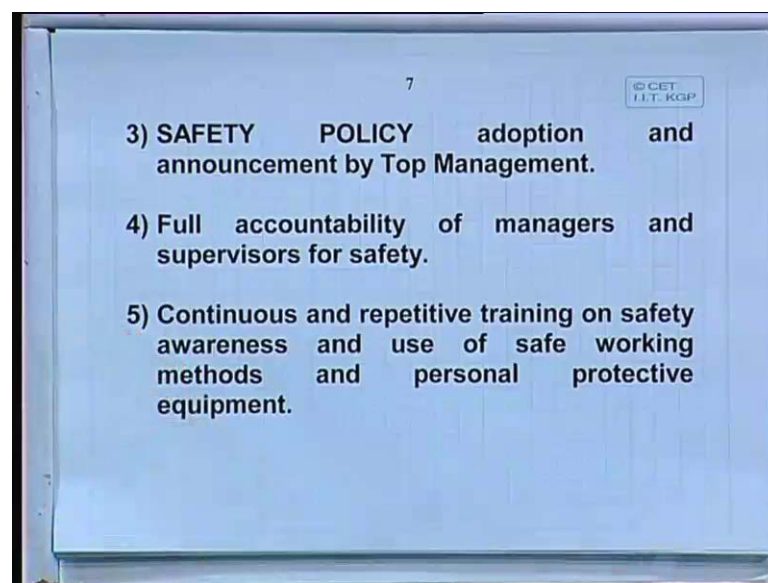
Mechanisms to ensure that proper attention is given to all levels to safety matters, again you have to propagate the philosophy; you can do it by various means. Most factories they have some programmers built in, where you have safety awards, safety competitions between the various workshops, you have a safety award and that is judged by sometimes the frequency rate and the severity rate, sometimes they have additional factors which are indirect factors, which make it safer like house-keeping. If you have a factory where everything is arranged neatly etcetera, then the chances and the potential of having accidents is lower. So, good house-keeping is another point, which is assessed to see whether you have safe working conditions or not and these awards are given inter departmental awards are competition is there. So, why do they have it? Basically, to build a philosophy that management considers that safety is very important and therefore, not only spends money and time, but it recognizes departments and people

who have made some contribution towards the furtherance of this safety and mechanisms to ensure that, proper attention is given at all levels to safety matters.

In fact, some of the companies which are in high hazardous industries like let us say oil refining, because you have a high fire hazard, chemical plants where toxic gases are used as raw material, may be you have plants where chlorine is used. Chlorine is a toxic gas which you have to store it, all right and then you have to use it in such high hazardous industries, **right** companies that operate in it, they have got a policy that even a departmental level and individual level, they build into the performance management system, that is how good, what increment should you get, what promotion you should get, they build the safety factor into that also.

For instance, there are very good performer a manager in a department, if safety is something which has suffered, that means, there have been accidents he may lose a promotion because that is so important for that kind of industry. So, there are various ways of propagating the fact that, management considers safety important and you can build it into not only into a safety programmed, but other important programmed of the company like performance manager, safety policy adoption and announcement by top management.

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So, now, days each of this companies you know after the Bhopal as I said lot of legislation, lot of soul searching thinking went on worldwide. And now most companies

they have a declared safety policy, it is a written statement and the safety policies always signed by a very senior person, may be the managing directors of the company or if it is a large company, may be the director in charge of that division, you know all the plant manager and the safety policy declare the intension and philosophy of the management for safety, so that all the employees they know it and why are they disclosing this, to show the intension that we will stand by it, because if you declare something you have to do it, isn't it. So, therefore, they will stand by that is to declare the bonfire intensions of the management, because once if you declare it, the chances are that the management will insure that it happens.

Then full accountability of managers and supervisors for safety. If an accident happens and death occur god forbid, who is accountable? Unless you have some accountability can you ensure that people will follow this? May not be able to ensure, so what happens now? They pinpoint who is a person who is responsible, who will be answerable and accountable and if proved guilty will go to jail **all right** in that organization.

Continuous and repetitive training on safety awareness and use of safe working methods and personal protective equipment, all this is part of the safety policy programme. Every factory and every establishment where work is going on, they have what is known as an occupier it is a statutory term, occupier of the factory means in short conceptually he is the owner of the factory and usually, the occupier used to be the plant chief. But nowadays, after this Bhopal as I said, there have been many changes and the occupier has been not the plant chief only, but the chief of the organization, that is the chairman if he is the executive chairman or the managing director. Why are they doing this? To show that the government feels that safety is very important, because it is not only limited, the damage that can happen is not only limited to that one unit, but it is extended to the entire populous of the environment. So, the government steps in as it so important that, the number one of the organization itself is the occupier.

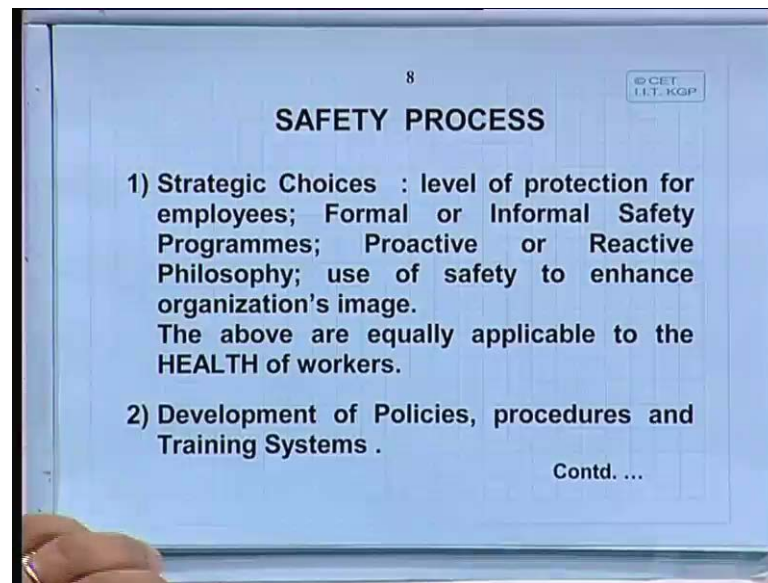
And then you have the manager of the factory, that is also statutory you have to declare it to the inspector. Who is the occupier and who is the manager? What is his home address? What is his office address and telephone number? So, that it is clear, he is accountable. So, imagine a situation where you are chairman of a company, which has 10 factories you are the occupier, how will you ensure that safety is being maintained in all? Because if anything goes wrong in any factory, you will be arrested, how will you ensure that?

You have to have a safety programme, you have to have a declared safety policy, and you have to have compliance reporting procedures, is it not. So, every factory probably every month, we will have to give through the chain of command right from the shop floor that whatever is the compliance to be done.

For instance, you have rotating machinery in a particular shop, have you provided safety guards, if you have got cranes have you done the inspection, so which date have you done? So, these are compliance documents, which have to be given right up to the occupier of the factory so that in the event god forbid, that some fatal accident occurs, at least the occupier of the factory, can say that he has put in place several procedures genuinely because he has a regard for safety, but unfortunately it has happened it is not due to neglect, not due to trying to save money for the company, that is a reason which is important to have these in place.

Full accountability and continuous, repetitive training on safety awareness and use of safe working methods, and personal protective equipment usually, now there is statutory provision if you have more than so many workmen, **all right** you are required to keep a qualified professional person, safety professional and if you have more than even more it may be two professionals, three professionals that are safety engineers. Usually, these are post graduate diplomas that you get, normally you are engineering degree and a post graduate diploma. So, such people are employed all right and this is a law statute and they have to run the training programmes, this continuous and repetitive training. So, budget has to be provided by management, they run the programmes and then after that, they keep repeating it. So, that if you are there every year, every two years or three years, you keep on repeating some of the programmes and these programmes are updated, any questions?

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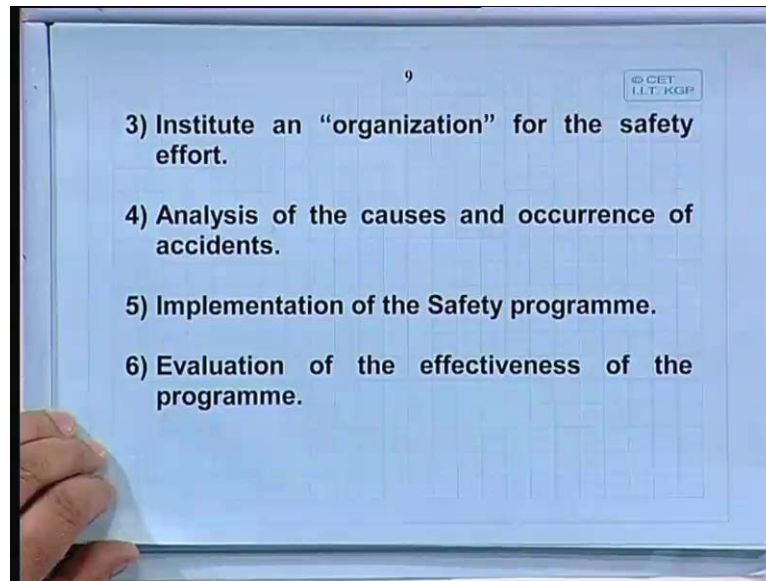
Then safety process, strategic choices: level of protection for employees, formal or informal safety programmers, proactive or reactive philosophy, use of safety to enhance organization's image. The above are equally applicable to the health of the workers. So, as I said, safety and health are two sides of the same coin because if it is unsafe and you have an accident, you injure yourself, it becomes bad for your health does it not.

Development of policies procedures and training systems, so first is choice, what level of protection? If you say, in our company we will take the level which is the statutory compliance level that is a philosophy you are taking, we will spend enough money on everything to see we comply with the laws of the land, it is like quality, the company has to take a policy decision, what quality are you aiming at? Are you aiming at the quality as per the standards or are you aiming at a quality which delights the customer that is much higher than what the minimum which is specified is the same with safety.

You will say, we will aim at safety, where we will be nationally recognized, we win the national safety award every year, then the whole philosophy has been laid down by management which is different, it is a higher level safety programmed that you have to have, so that is the minimum of that. Then, institute and organization for the safety refer, what organization means? Like I said there has to be a safety department, has to be a safety manager with one or two assistants, who look after this programme.

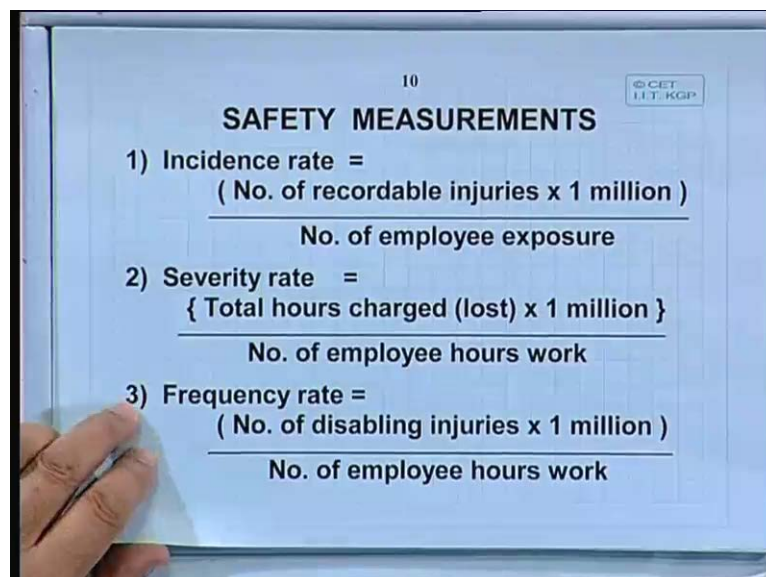


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So, there you are organizing for it, analysis of the causes and occurrence of accidents, every accident that occurs has to be analyzed, it has to be sent to the appropriate level may be the head of the plant, you have to decide, what type of accident and what periodicity, these information, these reports have to be sent, so that the management takes due cognizance of it.

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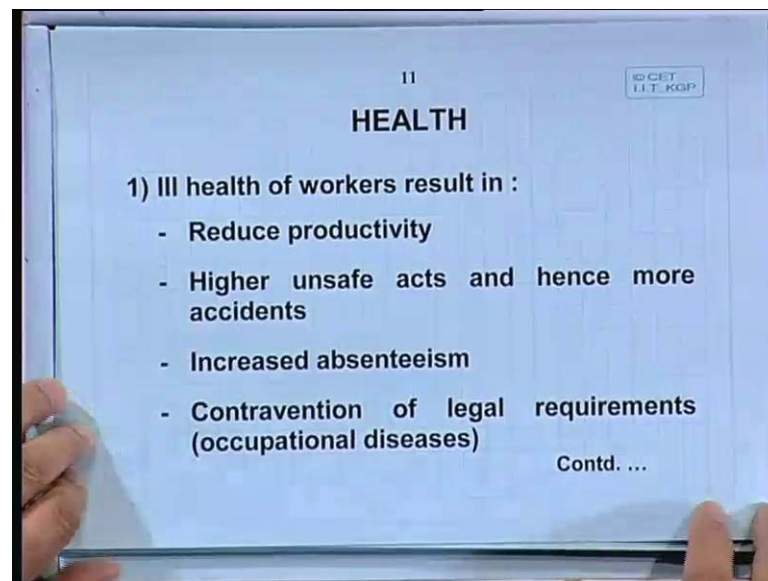


Implementation of the safety programme, you announce safety programme, you have to implement it, evaluation of the effectiveness of the programme, all these are job of the

safety manager. Then, we talked of the safety measurements of severity rate and frequency rate, these are simple ratios. Another one is incidence rate is equal to number of recordable injuries multiplied by a million into a number of employees exposure, number of employees.

Severity rate a total hours charged, that is lost charge means; how much money you have paid, you have lost hours multiplied by a million divided by number of employees hours of work, that is in hours, that is the first one is number of employees. Frequency rate number of disabling injuries, multiplied by one million divided by number of employee hours at work, so these are simple ratios by which you measure. So, now, having talked of safety that is one side of the coin, we come to the health which is the other side of the coin, **all right**.

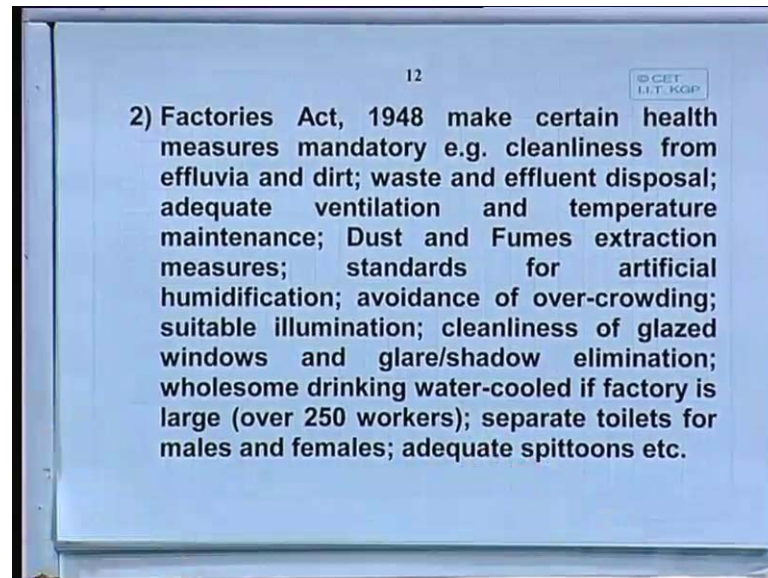
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Ill health of workers results in: reduction of productivity, higher unsafe acts and hence more accidents, if you are ill, if you have a bad headache, you are likely to be not that alert, therefore, unsafe acts you may be doing, which can result in accident. Increased absenteeism, so bad health means, you will absent yourself, more contravention of legal requirements, occupational diseases. That means, say you are working in an environment where there is a lot of a fumes and gases and you have not taken adequate safety and health precautions for it. Then, the people who are working in the department may over a period of time contract a respiratory disease let us say, which we call occupational

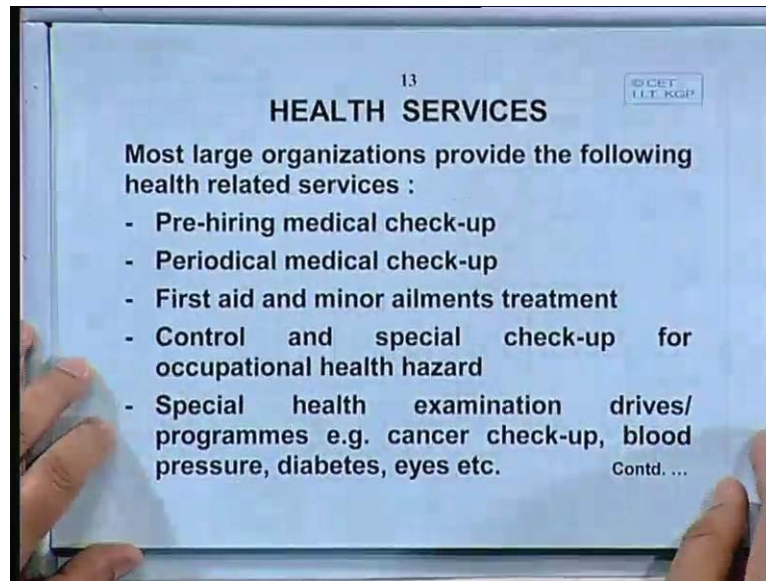
disease, that is that disease which has happened or has been contracted simply due to the occupation of that employee, had he been in some other department, he would not have got the diseases, so that also is responsibility of the management.

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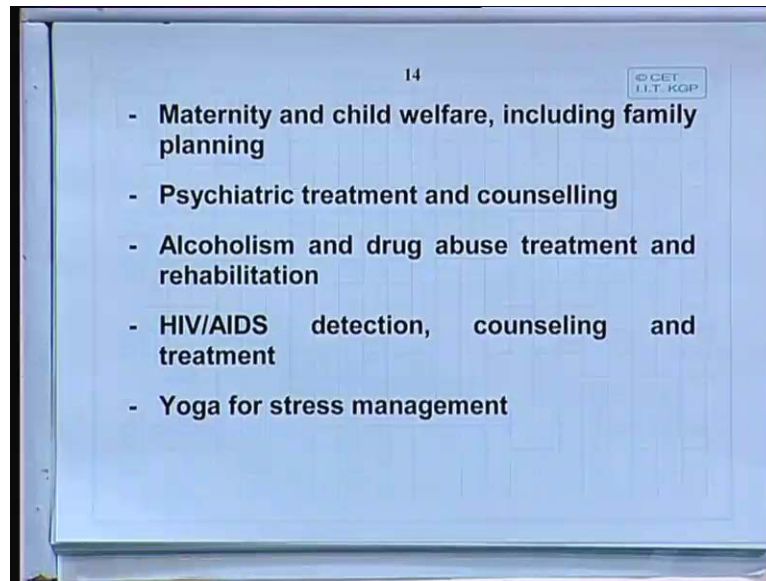
The factories act, 1948 is a very important act where many of these provisions for compliance is laid down, make certain health measures mandatory. Example cleanliness from effluence and dirt, waste and effluent disposal, adequate ventilation and temperature maintenance, dust and fumes extraction measures, standards for artificial humidification, avoidance and over-crowding, suitable illumination, cleanliness of glazed windows glazed means what, glass windows and glare stroke shadow elimination, wholesome drinking water-cooled if a factory is large over 250 workers, separate toilets for males and females, adequate spittoons etcetera.

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And most organizations which are large have the following facilities, pre-hiring medical checkup, before you join there is a medical checkup, periodical medical check-up after you join, first aid and minor ailments treatment, control and special check-up for occupational health hazard, those who are in departments whether it is occupational health hazard they have more frequent check-ups free, the management provides. Special health examination drives and programmers like you may have in a year, dry for blood pressure you have got 1000 employees in your organization, you want to check how many have got high blood pressure or diabetes, so these are drives example cancer or blood pressure or diabetes or eye check-up.

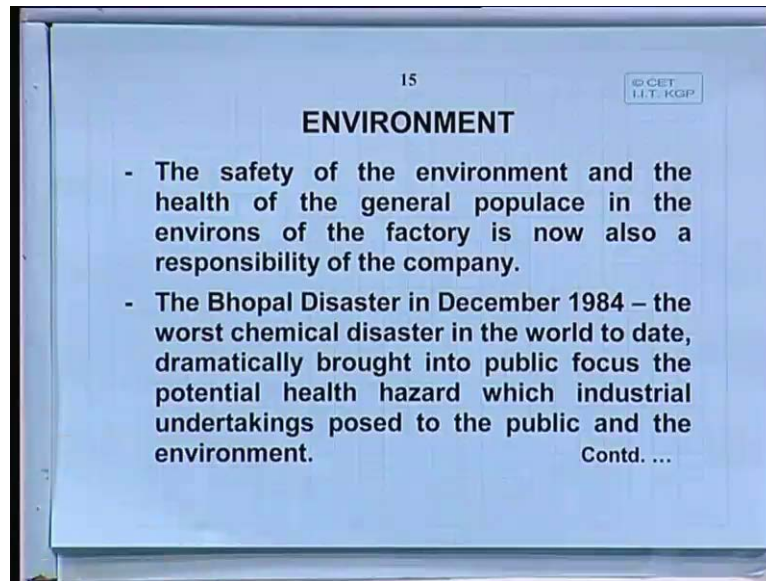
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Then maternity and child welfare including family planning, psychiatric treatment and counseling, we have trained counselors in large organization. You have a welfare department which we talked about in the last lecture, where these people are available medical counselors and psychiatric counselors. Alcoholism and drug abuse treatment and rehabilitation, many large units they have in fact, certain programs where alcoholism is tackled like you have a world-wide entity called alcoholics anonymous, it is a kind of a club. All alcoholics they join that because there is therapeutic value in collective therapy, if all alcoholics meet and they recount to each other, the various problems they had because of the alcoholism that is a group therapy, what happens is, people then appreciate more and it can stave off falling into this addiction, once again you know once you are cured you attain.

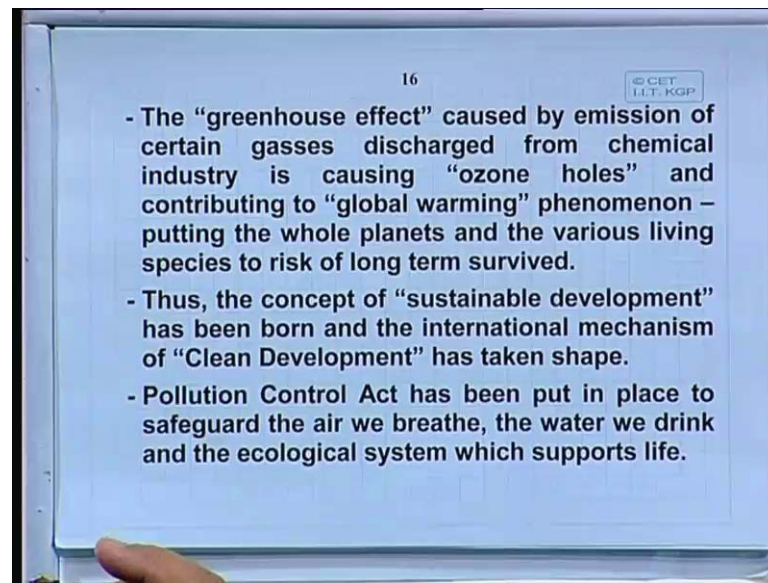
So, many large factories provide the facilities, their facilities to hold the meetings of this alcoholic anonymous including their own workmen and workmen from the neighboring factories. Then what is most important now, the modern threat is HIV and AIDS detection, counseling and treatment, then yoga for stress management, these are all part of a comprehensive health programmes all right, which is part of other side of safety as I said.

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Now, we come to the environment, **environment** the safety of the environment and the health of the general populace in the environs of the factory is now also a responsibility of the company as we said earlier. The Bhopal disaster in December 1984, the worst chemical disaster in the world to date, dramatically brought into public focus, the potential hazard for health which industrialized undertakings posed to the public and the environment. Now, people are frightened to stay near chemical factories because you do not know what is going on inside, when there is going to be a gas leak and you will be a victim of it, although you are not working there, you are staying there in the neighborhood.

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Then green house effect, all of you have heard of green house effect, **all right** this is caused by emission of certain gasses discharged from chemical industry and is causing ozone holes, depletion of ozone in our atmosphere and contributing to global warming phenomenon, putting the whole planet and various living species to risk of long term survival. Thus, the concept of sustainable development has been born; an international mechanism of clean development has taken shape.

Clean development this is a new thing which has happened by a protocol, cure to protocol have you heard about, they say in certain industrialize countries have contributed much more than the lesser developed countries to this green house effect and the ozone hole because of the industries that have come up and the care which they have not taken to see that dangerous gasses are emitted. So, having done that, the protocol is they agree that they will not do further industries of that type, but there are other countries, where they have not. So, they have got standards laid down, what should be the level of pollution in the air and so on and the percentage of gasses which should be there in the environment, **all right**.

And those countries which have gone well below the level, the countries can buy the right to locate their factory in those countries, the whole idea is to bring uniformity and control the level of pollution world-wide, that is called clean development and it is a multi-national effort very much, **very much** that is why you can earn a lot of money,

India can earn a lot of money because we have got a lot off, we can sell these rights you know for inviting development into our country from countries where they are not allowed to develop in certain industries.

So, that is why gives you a cost **all right**, which will be a lower project cost because, if you do it there, if you do it in India, then the kind of equipment which otherwise would have to be provided by doing it in their country. An industrialized country you may not have to provide the same kind of equipment. So, it has some bearing on your project cost also and it is something which can be sold by the donor country because this is their right, they have that right to sell you that, so that you can locate your factory here **ok**. So, we will end this one, and in the next class, we will take up the next topic, **all right** which will be industrial relations.