Health, Safety and Environmental Management in Offshore and Petroleum Engineering

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Module – 02
Operational Safety
Lecture – 04
HSE guidelines

Friends, welcome to the 4th lecture in module 2 on the online course titled HSE practices in offshore and petroleum engineering. In this 4th lecture, we are going to discuss about some of the important HSE guidelines, which need to be followed in oil and gas sector. In the last lecture, we discussed about two case studies, very briefly. We tried to arrive it; the important violations, which we could observe from the case studies. The second one was quite interesting related to the oil spill, which was from the Exxon Valdez oil spill, which is an important lesson. That is how such hazardous events can be prevented and what could be the major source from which this instance would have happened.

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So, it is very important to know that all the offshore oil and production platform should be checked for the oil spillage in water bodies. So, they should be checked for oil spill in the water bodies. One has to ensure sufficient control measures to basically avoid such situation because after the Exxon Valdez oil spill event, it has become one most

important highlighting situation for all the regulated agencies in the world to ensure some control measures, which could look upon the avoidance of such oil spill or atleast minimize the hazardous conditions; because you already know from the first module lectures, what are all the hazardous conditions which can cause serious consequences environment from the oil spill, essentially. So, this was discussed and case study was presented in detail in Srinivasan Chandrashekaran, 2011 A and B, in the set of references given in the website of NPTEL course of HSE practices.

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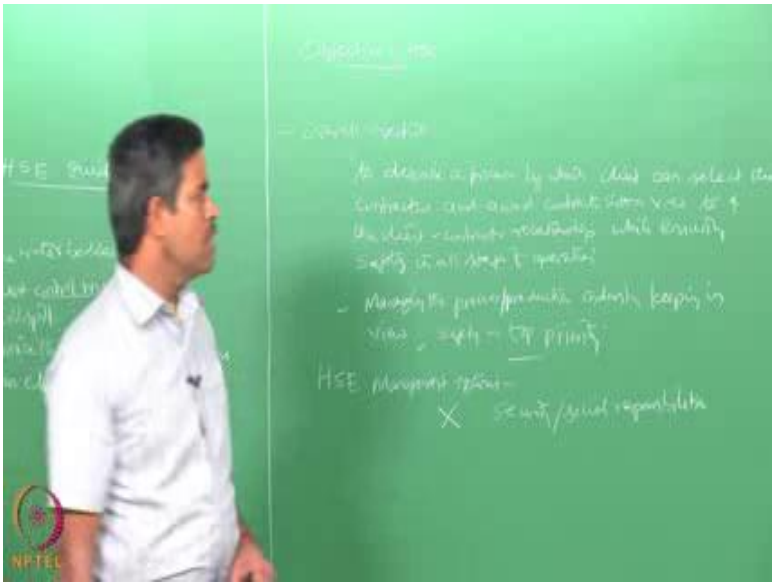

Now, let us come down to essentially writing the list of objectives of HSE. What an HSE should ensure? so, one can say the overall objective is to describe the process by which the clients can select the contractors and award contracts with a view to improve the client contractor relationship, while ensuring safety in all stages of operation. So, essentially HSE is focussed around managing the process and production industry keeping in view, safety as top priority.

Very interestingly, HSE management systems do not elaborate on the security and social responsibility. Of course, they are integral elements of the HSE system. But, they are not in detail elaborated, especially in HSE management systems. So, the active and on-going participation by the client contractor and the sub-contractors are essential to achieve the goal of effective HSE management.

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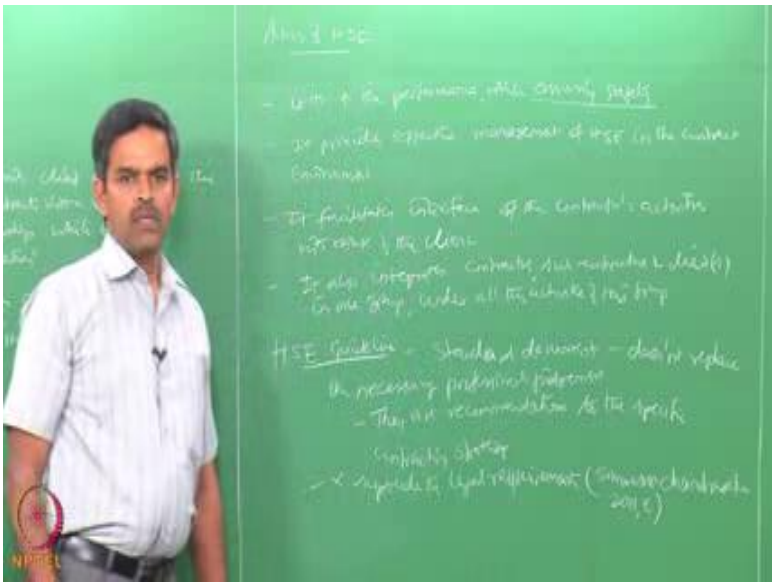

Let us see what are the aims. The foremost aim is to improve the performance while assuring safety. It provides effective management of HSE in the contract environment. It facilitates interface of the contractor's activity with those of the client. It also integrally connects; integrates contractors, sub-contractors and clients in one group, under all the activities of this group.

So, HSE guidelines are generally framed by keeping in the objectives and aims as we just now discussed. So, it should enable the contractor, the sub-contractor and the client as a one group, so that all HSE guidelines are framed in such a manner that the process is clear between the integrated systems of this management, which are nothing but the contractors, sub-contractors and the client group. So that, keeping the primary objective as safety assurance, in mind. Of course, we already know safety is designed in such a manner that it or not only enables protection of human being or personal working on both. But, also the equipments in the environment in the society all as one brace, HSE guidelines is a standard document which does not replace a necessary professional judgement. Please understand this, the professional judgement which arise from the experience, need to be anyway followed. In addition, these guidelines can be also followed, so that put together there is an effective safety assurance happening.

So, they are recommendations to the specific contracting strategy. In general, these guidelines are not intended to take precedence over host countries legal or other

requirements. That is very important. So, these guidelines do not super cede the legal requirements of the local agency of the body, Srinivasan Chandrashekaran, 2011.

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Let us look at the scope of HSE guidelines in detail. HSE guidelines provide a frame work for developing and managing contracts in offshore industry. We all agree that while HSE standards are very important, these guidelines do not cover many vital aspects of contract process. That is very important. These guidelines do not cover many vital aspects of the contract process as itself. It is focussed essentially on safety assurance in the contracting management system or the contracting strategy. They prescribe various phases of the contracting process. Keeping in focus the responsibilities of all the players in the contracting system, (Refer Time: 10:02) planning. And, hence the evaluation of the contract process, it begins with planning and ends with evaluation of the contract process.

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Let us ask a question. How to emphasis need for safety or what is the need for safety? Who does this actually? Employers should establish teams, so the initiative is essentially from the clients or from the employers. Should establish teams to improve, monitor manage safety practices or issues. What are they? For example, quality assurance.

So, quality assurance will lead to control or guide contractors to practice good safety norms, while contract is in progress. So, it ensures quality in terms of progress with, without compromising safety. Employees also have a role in safety. They are empowered with the freedom to stop the entire production. If they become aware of any problem affecting the quality of production or system management, if the, even if we notice there are some violations, there are some deviations because of the faulty maintenance of the equipment. So, there is a quality challenge in terms of safety assurance or there are some negligence from the management side in practising safety or in implementing the recommendations, given by the employees. To ensure safety, employees individually have a right to stop the whole production line without compromising safety. That is one of the important role played by the employees, in terms of safety assurances.

So very interestingly, this is a very common industrial practice. The very common industrial practice; because this increases and ensures increased participation of safety assurance schemes. And, of course it maintains quality in terms of system management, as well.

And more interestingly, such practices also reduce the cost line effectively. So, the production cost line is brought down effectively when the whole team comprising employees and the employer's representative work towards safety assurance program, which is essentially important emphasis on need for safety, which is in the scope of HSE guidelines.

So interestingly ladies and gentleman, it is also a similar trend in practising safety norms, as well. Unfortunately, it is observed that only in many process industries, employees are not involved in the safety process, except that they are members of the safety committee. So, just becoming a member of a safety committee without implementing your rights, your rules and your obligations towards safety assurance is of no use. So, safety assurance will come only when the employees have prevalence in exercising the rights and responsibilities in terms of even stopping the production line, if there is violations safety. Even though, the violations actually come from the management side. So, that is a very important part which we have; want to understand. It is also important to realise that if one desires to improve something for which the employees are responsible, then one should establish that it is an important component of the work day by getting it to a constituent of the business.

So, the employers should also feel that participation of employees is not a disturbance in the safety program, but it is always going to bring down the production cost line because that is a very important industrial practice, which is prevalent in many developing countries in the world today. Therefore, friends, by involving the employees in the safety assurance program what are the merits or advantages?

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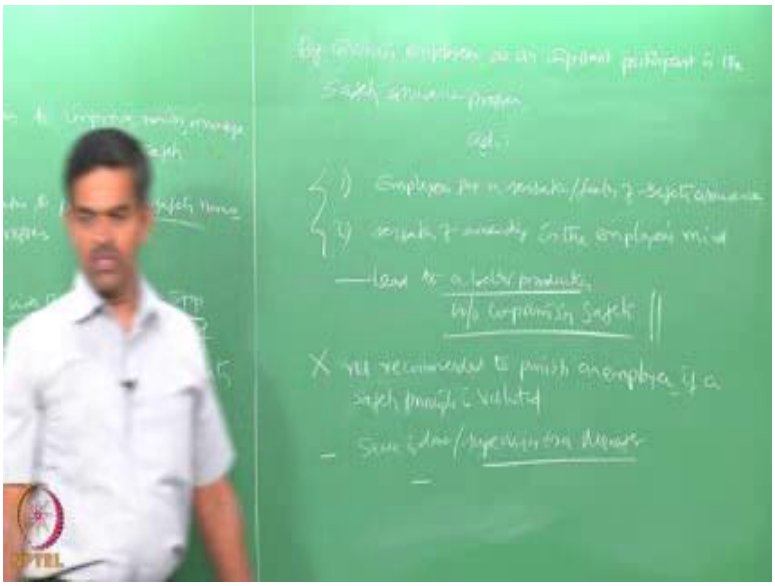

So, by involving employees as an important participant in the safety assurance program, what are the advantages? Employees get a sensation feeling of safety assurance. As I said, safety is to be felt. Violation of safety should be also felt by the employees, who are the first level user. It also generates sensation of ownership in the employee's mind. That is very important because both of this could lead to a better production without compromising safety.

That is a very important achievement. And, it is considered as an advantage. However, it is not recommended to punish an employee. If a safety principle is violated, but if the same is done by a supervisor or a manager, who is considered to be much more responsible, then it is necessary that a sufficient training must be given to the system to ensure safety practices in the work front.

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Therefore, an important task of the manager is actually guarantee that the job is performed right and safe; that also important. Why we are focusing on managers? Because managers are always function of the safety problem; since, they are function of the problem, they should provide solutions. That is very obvious. The long lasting safety success cannot be assured, unless the management team is a function of the safety effort taken by the organization.

Therefore, goal of every organization should be to construct a safety culture through the employee engagement. Now, we are getting the employees involved in performing inspections, investigations and other procedures, needs for safety in health program can be very easily and conveniently met. Employee's safety, therefore, can be maximized by making a safety culture through the increased consciousness. That is very important. Safety should become a culture, which need to be practiced. This should be achieved by increasing their consciousness towards safety assurance. In particular, a skilful director of an oil company will make all efforts to improve and regularise the outcome of the business in its entity. Although, it is not unusual for a manager to excel in certain fields, therefore, it is important. Friends, to note that, in the work place there are several minor issues at the micro level that must be successfully managed, for the company to succeed in the oil business.

One of these issues should be hazard control. One must therefore establish quotas or reward individual achievements to recognise outstanding production effort of an individual employee, while keeping safety in mind or encourage group of employees, involve them in safety development programs and reward them suitably. So that, all will get motivated to follow a safety procedure without affecting the production line of the whole business. Alternatively, one can also ensure that in this rigorous task, safety is not compromised even unknowingly. So, as far safety and health is concerned, if the company (Refer Time: 26:13) to manage them for the maximum success, then there is also a need to execute the program in the same manner. Safety managers are therefore experts, who coordinate these efforts and keep the top management informed. Therefore, they become a very important segment in the whole exercise.

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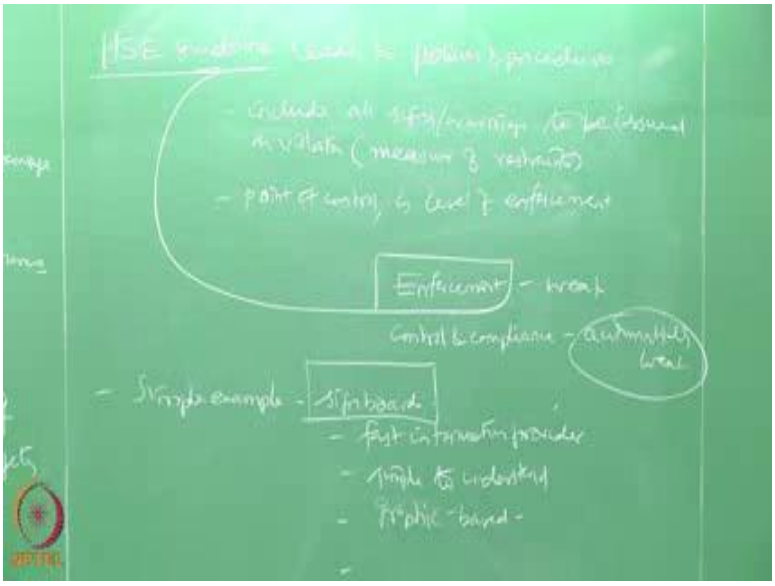

The HSE guidelines leading to policy and procedures should therefore include all possible signs and warnings to be issued on violation. While doing this, one should note there should be some measure of restraint also; because you know in oil industry we have something called acceptable level of risk.

Therefore, the point of control in the whole exercise is only as effective as a level of enforcement. Where enforcement is weak, control and compliance are weak, as well. So, the enforcement is weak, control and compliance is automatically weak. So, HSE guidelines should be strictly enforced. That is important.

The best suited example, which is very simple in ensuring safety is the sign boards. So, simple example could be the sign boards, which gives enough information about what to follow and what not to follow. They are fast information provider; they are simple to understand. They have no language barrier because they are graphic based. As they are graphic based, they have no language barrier. They can be treated as your mass media communicator because it can reach many people instantaneously. In most cases, the sign boards are not properly seen in the safety practices. And therefore, accidents occur. Therefore, it is not the sign board which is important; it is a content which should provide basic information of the do's and do not's in a very brief manner in the work place so that, it ensures and enforces safety while production line is on; keeping in mind, the safety and health of both the employees and the employers at work place. So, this will be helpful to prevent the employee's injury, sickness etcetera.

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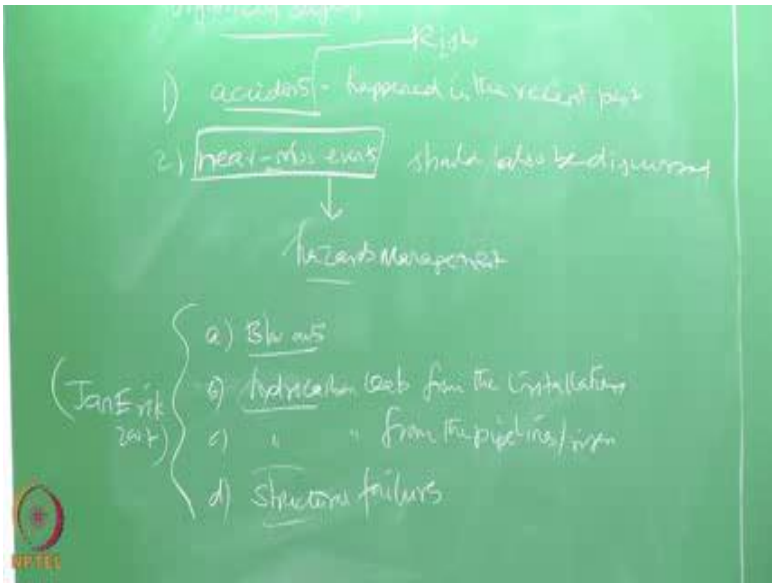

Organising safety; we have already said that major accidents reported in oil and gas industries in the past or important sources to understand safety and consequences of safety violation. So, one foremost issue could be the accidents happened in the recent past. That is one source, based on which we can teach safety.

The second could be near-miss events, which could become accidents should also be discussed because near-miss events actually focus on hazards; whereas, accidents focus on risk. Risk aversion is an effective system. No doubt about it. But, risk is always

addressed based upon the happened situation; whereas, hazard is on the anticipated situation.

So, one should look at the hazard management. So, near-miss events are important source of information for organising safety. So, lessons learnt from the accidents through detail diagnosis will be helpful in preventing the occurrence of similar event in the near future. It is true that important experiences gain from these events may be blanked out and information may not be brought forward to the future generation, if analysis of the accidents and near-miss events are not reported.

So, the major risk groups in offshore and oil industries, essentially our certain segments which one must focus as education point of view; one could be the blowout; other could be the hydrocarbon leaks, leaks from the installation. Next could be hydrocarbon leaks from the pipe lines or rises. Next could be the structural failures. So, they are very important source of information, which should understand in education perspective to practice or implement or frame guidelines for HSE.

So, let us focus some of them. Now, to understand how and what lessons can be learnt from these kind of events, let us talk about eco fix blowout happened on 23 April, 1977.

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A blowout has occurred in the steel jacket wellhead platform. During a work over and production (Refer Time: 34:26) the blowout preventer was not in place, was not installed

and could not be reassembled on demand also. All the personal and board where rescued without injuries through the supply vessel. But the actual result in oil spill, the consequence is no loss of human life. That is good. But, resulted in oil spill of about 20000 cubic meter of oil, which is very bad. The well was then mechanically capped, after seven days after the event has occurred and the production was shut down for a half a dozen week to allow the clean-up operations. Although, (Refer Time: 35:30) will be blowout. It did not call for any human death or material loss and must exclusive limited only to oil spill, but still it is an important lesson learns that capping of blowers is possible, although it requires time.

This may be one of the important information in the design point of view, which was in subsequently considered in the Enchova blowout, in the design of Enchova blowout preventer. So, this was considered as an important condition that capping of wells should be available on demand. So that, even the oil spill occurs, it should be able to control from the (Refer Time: 36:18) source.

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Enchova blowout occurred on 16 August, 1984. It occurred on the Brazilian fixed jacket platform, which is Enchova I. To give a just statistics to you, it was producing 40,000 barrels of oil a day. That is the production capacity, and 50000 cubic meter of gas. The total well interconnected in this particular platform is about 10. Interestingly, the first fire was due to ignition of gas released during the drilling, during the drilling process. The

fire then leads to oil leakage, which leads to a knock. The fire due to the oil leakage, then subsequently lead to the knock. This ensures that flame was completely blown out, late the following day. So, they results in a big fire.

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Friends, look at the screen, now. We have a captured picture of the Ekosfisk blowout happened on 16 August, 1984 are the Brazilian fixed of the platform. And, the picture shows how the firefighting was done parallely from the vessels to control the fire. And, explosion occurred in the well. The platform's drilling equipment was completely gutted. But, however the structure of the platform remains intact, 36 people were killed.

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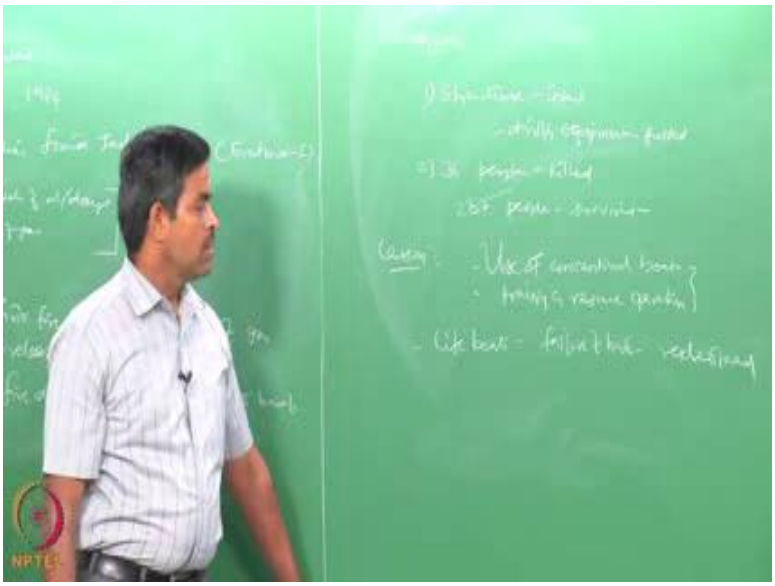

Consequences: structure remains intact, but drilling equipment completely gutted. 36 people on board were killed in the accident. Of course, 270, sorry, 207 people were survived by the life boats. So, people could save the maximum; few of them were not be able to save.

The most vital lesson what we could learn from this could be use of conventional boats training in rescue operation, etcetera are important which are useful for risk control, especially in such emergency situations. Failure of the hooks in the life boat gain attention and that relates to re improvement in the design.

So the life boats, there were no; there were interesting incidents of failure of hooks in the life boats. So, they were subsequently redesigned. That was the feedback which we got as per the accidents lessons are concerned. Lack of competence to control the release mechanism, led to stringent training of personal safety after this accident, people are not trained in evacuation process and rescue operations as a part of the safety program. So, after this blowout occurred, then stringent training programs has implemented in oil and gas sector. So, everybody was intended to be trained rigorously on the rescue operations and management skills, especially during such emergency.

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Friends, if you look at the screen now, you will see a captured picture of the Enchova blowout, which occurred on 16 August, 1984. So, in this lecture we learnt lessons from couple of accidents. We also said what are the important HSE guidelines, policies and principles; what are the aim, objective and scope of a good HSE program or a safety program; why employees should be involved as an important participant; in this program; what are the roles of employees and employers, what are the obligations of contractor, client and the sub-contractor group, in the whole safety assurance program. And, how one can diagnose the accident scenarios to understand better safety implementation, as violated in those accidents, mostly and interestingly if you look at them, organising safety is very vital and important. And therefore, should become a policy in terms of HSE management in the system itself.

Thank you very much.