



Power Plant Risk Management

Submitted by

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**A DISSERTATION REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
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LETTER OF ACCEPTANCE

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Dear Sir,

Jitendra Dixit is registered for Power Management, with the University of Petroleum & Energy Studies, Dehradun in July 2016 batch.

I hereby give my acceptance to guide the above student through the Dissertation work on 'Power Plant Risk Management, which is a mandatory requirement for the award of EMBA Degree.

Thanking You

Yours Sincerely

Tulendra Choudhary

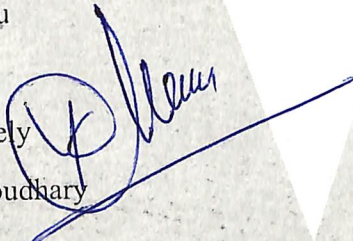


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Executive summary & Abstract

This technical document on risk Management as a tool for improving power plant operation is part of ongoing on Management of power plant operation and maintenance in a competitive environment. The overall objective of this project is to assist the management of operating organization or power plant in identified and implementing appropriate measure to remain competitive and rapidly changing business environment. Other reports developed through this program have identified overall strategy and techniques that power plant operating organization managers can used to succeed in more competitive energy markets.

This study is subjected to the investing risk and hazard exposed by employee of power plant operation & maintenance department on power plant area, as well as to assess risk probability and to study risk management of boiler, Turbine, water treatment plant (WTP) & CHP area operation & maintenance activities at chittor Cement Captive or green Power plant (NUVOCO) Chittorgarh Rajasthan. This assessment are based on "LEAP O" program which typically used to identified hazards that will causes a disturbance of smoothly operation of power plant. Four main station were choose for the study of risk in the captive power plant has a Boiler area, Turbine area, WTP area & CHP area. Risk identification, risk assessment, and risk control have a based procedure of risk management in our pant which is solved by under various program.

The hazard identification was analysed through risk evaluation based on like hood and severity of the hazards. A total of 52 big hazards identified in power plant at the four stage station maintenance activities. The data acquired was summarised and categorized in three level which will higher, moderate and low risk. Generally 6% of hazard identified in low risk, 84% hazard identified in moderate risk and 10% identified in high risk. According to result the preventive and controlling masseur such as evaluation, elimination, substitution, engineering and administration control as well as personal protective equipment (PPE) recommended.

CHEPTEP-1

INTRODECTION

1.1 Study background: In our Cement Plant have two types of power plant 1st Captive power plant and 2nd west heat recovery (WHIR) green energy power plant. WHR Boiler drive from cement plant exhaust high temperature flue gas, which is generate high temperature steam for moving turbine, turbine mechanical energy convert electrical energy by generator. Same procedures follow in captive power plant, only there flue gas generate by boiler furnace.

Thermal energy → Kinctic energy → Mechanical energy → Electrical energy

My main focused on power plant doing risk identification, risk assessment and risk controlling with the help of various program. In CPP have a maximum possibility of risk identification compeer to WHIR because in CPP have a more rotary and operating system. capacity wise and operation wise camper to WHIR.

Power plant is much safer than they once were; however, employees still encounter hazards. In order to operator without a threat to the employees and environment, it is undeniably essential to have a safety management system (SMS) for a power plant. In concern with this, a strategy involving the identification and evaluation of major hazards is essential in order to obtain and implement steps for identifying risk element during operation & maintenance as well as to predict their like hood and severity.

There are many formal techniques for the systematic analysis of occupational safety and health in general, and risk analysis in particular for power plant. One of the techniques is risk assessment. Risk assessment is a form of documentation written to express an organization's dedication to employee health, wellbeing and safety. it is the most common way of ensuring a proper work place environment and to assess the nature of risk and hazard in work place.

The method the conduct the risk assessment in LEAP,O module. Hazard identification, risk assessment and risk control or LEAPO (TPM) is a process in assessing the risk as well as to determine the level of hazards and risk assessment in accordance with occupational safety and health.

1.2 Problem statement:- Risk assessment is used for risk management decision to ensure the hazard present in plant industry are required or eliminated if possible. In our industry

have two types of power plant which is describe in our introduction 1st topics. Both plant have a different operation procedure therefore both risk assessment are different. It will be make challenges of risk controlling when plant in running potion and have no space for taken breakdown because this is directly effected on our industry production loss and economically loss, this is lake of planning strategy, controlling risk and risk Assessment.

1.3 Objective:- During writing our dissertation report our objective mainly focused on risk management. My focused on three basic points that is, How can evaluate risk identification, risk assessment and risk control. For these three points we are study on LEAPO program with safety management system. Further I will briefly describe about LEAPO. For understanding out line of, this is a systematic method of maintaining our system by maintenance and operation department. Under daily ruten procedure operation department observe abnormality on running system with the help 7types of abnormality points and after finding abnormality start a given tagging procedure according to risk and types of work category, this three tag has a blue, yellow, Red.

In our plant under a LEAPO module running TPM program which is based on 8 column. his drive successfully for given help for risk controlling also other exalter such as OPL, Engagement, tool box, suggestion, observation, goal of TPM, SOP,FLRA, work permit, is a part of risk assessment under a LEAPO module for better risk management.

This study is performed to conduct risk assessment in power industry to ensure risk exposed to the employee is reduced and treated during operation and maintenance activities. Main Objective of the Study Are:

1. To investigate risk and hazard exposed by employee of mechanical maintenance department at the power plant.
2. To assess risk probability at boiler, turbine and water treatment plant during maintenance.
3. To study risk management of boiler, turbine and water treatment plant.

1.4 Conclusion: After study all topics regarding risk management in point of view industry or power plant. This is very important that it will be managed by progressive healthy system. After studying various types of book regarding risk evaluation, assessment or management have a many method for well maintain risk. I will also chose method between the book or world industry platform, I also used our plant NUVOCO standard system for controlling and good managing risk assessment or controlling.

The study focused on the accessed hazards exposed to the employee of power plant department during operation & maintenance work in the thermal power plant through systematic identification and documentation of major hazards. The study was done using hazard identification and documentation of the major hazard. The study was done using

hazard identification, risk assessment and risk control (HIRARC) worksheet based on the information supplied or relevant experience from the combined cycle power plant employee. In addition the management of risk and hazard was conducted by choosing the most reasonable preventive measures through a rational judgment and modification of existing preventive measures (control measure). The study was conducted to assess risk at certain station in the power plant which is the boiler, turbine and water treatment plant.

CHEPTEP-2

LITERAETURE REVIEW

As per our dissertation guidelines literature review is written in two points 1st as a industry sector points of view and second as a is pondering orgnigation. My maximum study it will be done by online books our plant books which is describe on this matter. Therefore i will try to given best review on this topic.

2.1 Introduction to risk assessment: In this past several decades, power plant owner and industry in general have vastly improved employ safety (Hansen T 2005). Although Power plant safety is consider safer compare to a few decades ago. Plant employee still encounters numbers hazards. Thus it is up to employers to implement program or policies aimed to eliminate the risk hazard to reduce risk face by the employee. Risk assessment is a practice or program that changes the working practice of the employees. It has become fundamental of the practice of planning management and the operation of a business as a basic of risk management (DOSHI 2008). Ongoing hazard monitoring and effective control measure are essential to ensure that improvement in occupational safety and health is continued (Smith 2010). Through risk assessment, employer can ensure that the hazard exposed by the employee is reuse or perhaps the risk of causes by the hazard is constable.

Risk assessment mines the process of evaluating the risk to safety and health arising from hazard at work. Risk assessment is the part of risk management. To be extract, it is the second stage of the procedure towers risk management. Risk management basically the overall procedure correlated to identified of risk, risk accessing, adapted control measure and the outcome of it (DOSE 2008). Several terms are defined below (Fred AM 2005).

- **Hazards:** are defined as the potential for harm. The dual nature of hazards must be understood, hazards include any aspect of technology or activity that produces risk, and hazards include the characteristic of things and the action or inaction of people.
- **Risk:** is defined as the combination of the probability of a hazard real incident occurring and the severity of harm or damage that could result.
- **Probability:** is defined as the likelihood of a hazard being realize and initiating an incident or series of incident that could result in harm or damage for the selected unit of time events, population or activities being consider.

- **Severity:** is defined as the extent of harm or damage that could result from hazard, related incident.

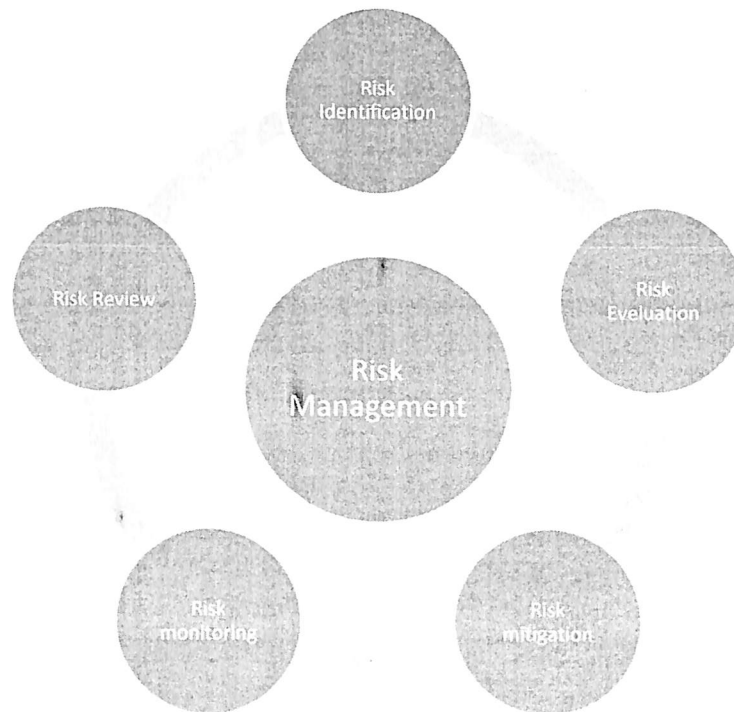
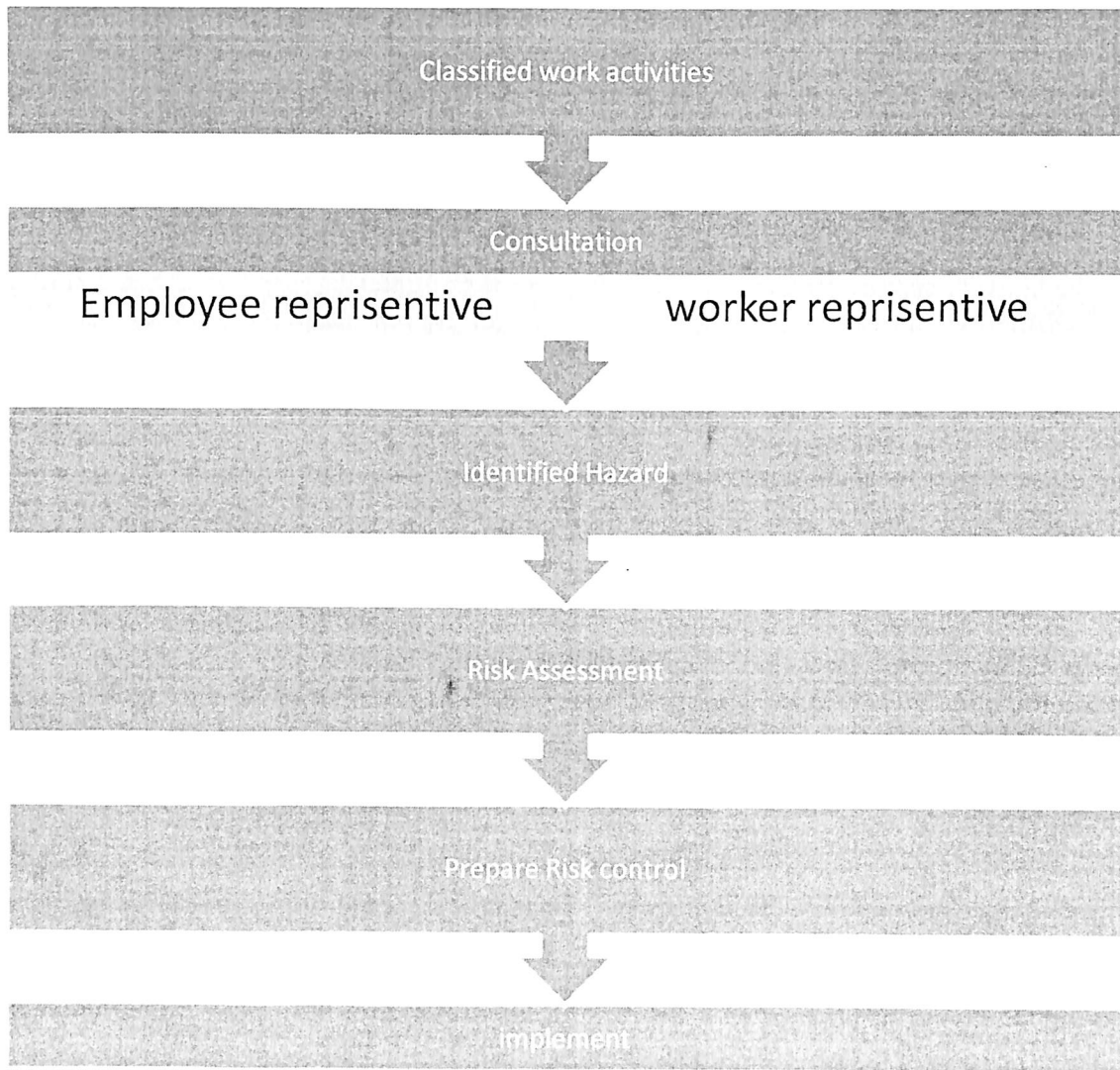


Figure2.1: Risk Management Process (Source British American Tobacco 2014)

2.2 Purpose of risk Assessment:- although risk assessment will not prevent any unwanted accident, but it play a very critical part in minimize the likelihood of the risk to be happened (Fred AM 2005). Risk assessment is legally required frogman esthetical prospective, the main reason this assessment is carried out is to prevent or make sure that employ is not killed, injury or become all at the workplace. Risk assessment also from an integral part of a good occupational health and safety management plan (Dose2008) that helps to:

- Create awareness of hazards and risk in work place.
- Identify who may be at risk.
- Determine and modified the control measures.
- Prioritize hazards and control measures.

2.2.1 Risk Assessment Elements: In conducting risk assessment, there are general elements that should be following based on international organization of standardization, which is the ISO 31000:2009 version. The figure show the element in risk assessment based on DOSH, hazard identification, Risk Assessment and Risk calculation guideline which accepted ISO: 3100



element in conducting risk assessment DOSH 2008

RESEARCH DESIGN, METHODOLOGY AND PLAN

Topic risk management is based on performance of plant or industry. If your plant performance is good in wide angle then probability of risk is less. There four it is very important for your plant risk management program and system is good & healthy for ever time, it will also actively work for system.

For deriving health risk management system required research, one methodology and active plan which is penetrate easily to last beneficiary of our plant. Required every employ participate for reducing risk, identified risk with the help of risk management system. In our pant Nuvoco vista corporation chittorgarh have a various program for controlling hazard under risk management and safety system. Our risk management system work in many direction, such as risk identification, assessment and controlling. With the help of these three category will be control plant performance and it will be maintain in daily routine work management or technical program.

For maintain a performance of our machinery system such as turbine or turbine machinery, Boiler, water treatment plant, and coal handling plant side use different program in dilly rotten for identified problem and take measure action according to LEAPO program such as 7 types of abnormality for searching problems, tagging according to types of problem blue, yellow, Red. After problem identification, doing work on evaluation then controlling whit the help of LEAPO TPM Autonomous maintenance or so many maintenance program. These all daily rotten activates completed by operation department on daily basis or maintain record. Show some tagging collar and its description.

Blue Tag: According to blue tag it has a normal abnormality, which is solved by salfe operation department, these type of problem is solved in one shift or maximum one day by operators normally there have no required specially maintenance department. For example blue tag abnormality have a low oil level, machine bolt losses, cable dressing, area cleaning, small insulation work, small leakage attend or so on. For this type abnormality use paper as a Tool box talk, Field risk assessment (FLRA), safe operating procedure (SOP), and Foggia record for risk assessment. Because if these problem is not solved at a primary condition, it will reach to higher category red tag which is volition of safety.

Yellow Tag: Yellow tag show the safety related abnormality, during AM activites many abnormality have a risky which is increase the probability of accident therefore these type abnormilites solved by urgent basis and yellow tag indicate a attention for particular point,

yellow tag abnormality may be have a low or higher risk according to importance, its type problem is solved in maximum two days. Such example of yellow type of abnormality is high temperature line leakage or without insulation, oil leakages, high temperture area burning probability, floor riling brake, confined assess, oil spared on floor have a possibility of firing or slipping.

Red Tag: If in plant area found red tag it can be major work or time taken work which is closed by only maintenance department, operation department inform to maintenance department. Before complete red tag work making a storing strategic planning in wide angle according to conceder economically, plant production, doing risk analysis & assessment. Before start work take a various types of permit according to work such a height permit, hot permit, confined space permit, so on. Example of red tag types of work is design changing work according to kizan program, machine parts replacement, cover maintenance, pump maintenance, turbine maintenance, new work. Boiler welding work and so on. These all types of maintenance work under LEAPO TPM Program.

In these all types of category must used toolbox talk, SOP, and FLRA, other program work on requirement. In our plant used advance TPM program as a LEAP O (learn engineering acceleration program for operation), with the help of LEAPO model we will drive TPM program in right direction according to TPM chart. According to TPM chart it is divided in 8 column or one base which is defined below. In other direction LEAPO drive other program such as OPL, 7 types of abnormality, Goal of TPM, Foggia, KIZAN, Suggestion, Observation, and Engagement.

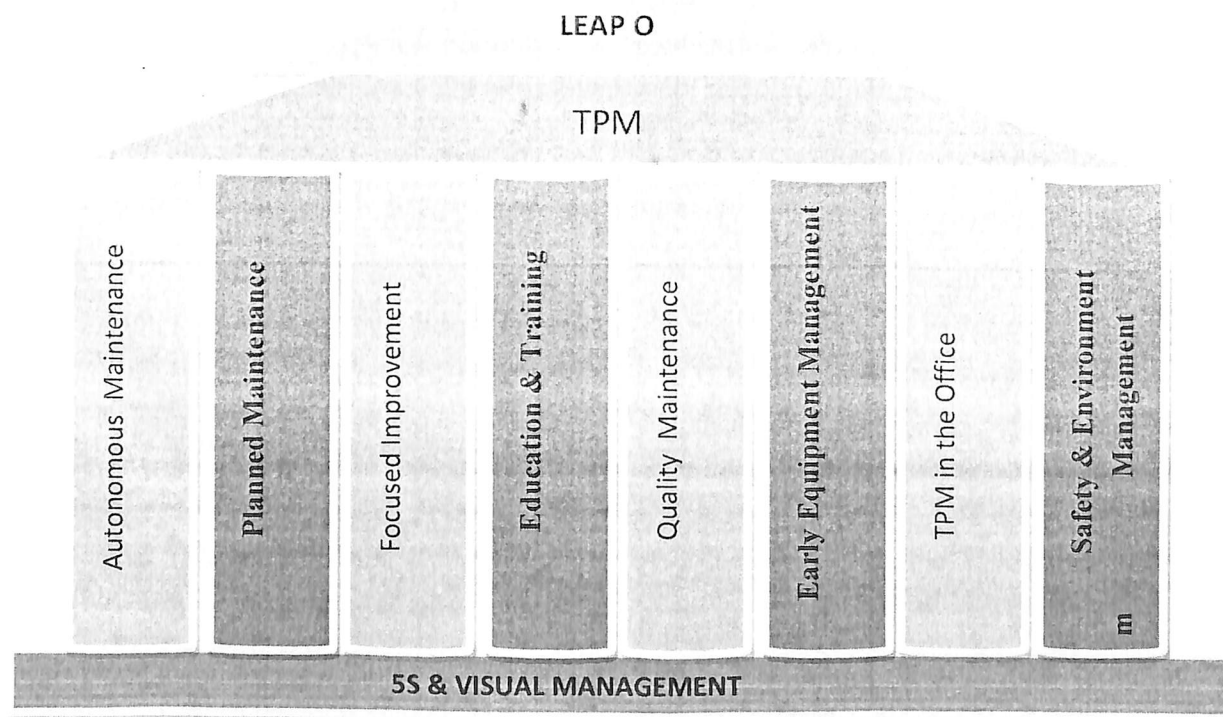


Fig 3.1

According to diagram small discussion about LEAPO TPM program. These all topics play a vital role for controlling risk and minimize the possibility of risk in system. Let's discussed on above topics shortly in point of view risk management.

LEAP O: Leading Engineering acceleration program for Operation, is design for making healthy system of plant, which is easily approachable for everyone and aim of program is easily understand to everyone. In our plant point of view under a LEAPO system have all programs which used in risk management for identify risk, risk evaluation and risk controlling, these program have TPM, Goal of TPM, 7 Types of Abnormality, One Point Lesion (OPL), KIZEN, Foggia, Suggestion, Engagement, Oversarbeton.

TPM : Total Productive maintenance is a holistic approach to equipment maintenance that strive to achieved perfect production without risk. No Breakdowns , No Small Stops or slow Running, No defects and no Accident. TPM Emphasizes proactive & Preventive maintenance to maximize the operation efficiency of equipment.

The one 5s Foundation and 8 pillars of TPM are mostly focused on proactive and preventive techniques for improving equipment reliability.

Autonomous Maintenance places responsibility for rotten maintenance, such as cleaning, lubrication and inspection in the hands of operations. It will giving helps gives operator grater 'ownership' of their equipment. Increase operators knowledge of their equipment. Ensure equipment is well cleaned and lubricated, identify emergency issue batter they become failure. For AM required Blue tag.

Planned Maintenance Schedule maintenance task based on predicted and/or measure failure these types of maintenance required Red Tag.

Focused Improvement or maintenance have a small group of employees work together proactively to achieve regular, incremental improvement in equipment operation.

Quality Maintenance design error detection and prevention into production process. Apply rote cusses analysis to eliminate recurring source of quality detects.

Education & Training Fill in knowledge gaps necessary to achieve TPM goals. Applies to operators, maintenance person and managers. Operators develop skill to routinely maintenance equipment and identify emergency problem. Maintenance person learn techniques for proactive and preventive maintenance. Managers are trained on TPM principal as well as on employ coaching and development.

Early Equipment management direct particular knowledge and understanding on manufacturing equipment gain through TPM towards improving the design of new equipment.

TPM In office Apply TPM techniques to administrative function Extend TPM Benefits beyond the plant floor by addressing best in administrative functions.

Safety & Health Environment (SHE) maintain a safe and healthy working environment,

Eliminates potential health and safety risk resulting in a safe work place, Specially target the goal of an accident free work place. Maintain a field level risk assessment (FLRA) every new job, it will be not re-used. Prepared safe operating procedure (SOP) of specific job, which is checked by HOD level person or safety department.

5s & Visual Management, the Goal of 5s is to create a work environment that is clean and well organized. It consist of five elements that is Short, Set in Order, Shine, Standardized, Sustained. It should be responsible initiative how 5s creates a foundation for well running equipment, for example in a clean and well organized work environment, tools and parts are much easier found.

Visual Management give a responsibility on responsible person for particular work for completing according to TPM 8pillers and 5s program.

Goal of TPM is Zero Accident, Zero product defects & Zero Equipment failure.



Except LEAPO TPM Program in power plant operation onather program under the LEAPO for maintain plant performance , risk assessment and risk control such as:

One point lesion (OPL) If engineer oversetting any valuable point which is increase plant performance reduced the probability of risk, then these types point are shear to our plant employ and operator by verbally and shear print copy in notice board.

7 Types of Abnormality show the abnormality of running system and categorised of problem these abnormality have miner flow, basic condition not fulfilled, Inaccessible place, source of contamination, Sources of quality defects, unnecessary items, unsafe place.

Fuguai is Japanese word also called abnormality is unneeded things which located at the wrong place or situations. In most condition the abnormality affected physical, functional and safety problems especially for machines.

Kaizen (Continues Improvement) is a strategy where employees at all levels of a company work together proactively to achieve regular, incremental improvement to the generation process. In a sense, it combined the collective talents within a company to create a powerful engine for improvement.

Suggestion in plant campuses have a suggestion box, where everyone given our valuable suggestion about plant performance, safety or improvement which is good steps or idea for controlling risk.

Engagement, in our plant have a online engagement system which is given good platform for shearing our toolbox subject to every employ and about the subject which is shear with our team during work. Engagement can be report on any subject which related to plant.

Observation, is one more online system in our plant for improving health and safety Environment. If you observed any risk and hazard related problem in campuses of plant updated on the online system. Then Regarding department will be solved problem in 24 Hr or less time. Observation have submitted in three category High, moderate, or low risk, which you will update according to importance.

3.1 Source of data:- For Risk Management study collection of tow types of data 1st primary data and secondary data. Primary data is a actual data of conclusion of our study which is effectively describe of analysis and plant performance. Secondary data is a base of primary data which is taking from our plant or outside old study on same topic, this is only given help for preparing primary data sheet.

Our primary data collected from power plant daily rotten Risk identification, risk assessment, risk control, TPM work, which is collect by operation & Maintenance Department , we also collect data from lour other program which work under LEAPO program, has a AM, fugue tags, Engagement, OPI., Observation, Suggestion.

These all topics are source of data, in our daily rotten work we are collect our data and make analysis and progression report. For example our AM members see some abnormal activeties in machine then he will tag on the machine as per category and mention on report. these report of the reason of analysis on particular machine and make a record report.

3.2 Sample size if any:- for analysis data, required sufficient every section data which will be provided actual analysis value fore given actual study. If data quantity is low then be will not reach to actual result and not find a right result, if you have collect more data then analysis on particular area is healthy.

According to our study I will collect data form plant four station such as Turbine area, boiler area, water treatment plant, and balance of plant in point of view risk analysis. From all four section collect 5-5 data on daily bases and compeer to internally in between area that which is work is best.

3.3 Method of data collection:- Risk management for a Risk Analysis are divided in three category which have risk identification, risk assessment, and risk controlling. My data collection is also based on in these three category, under a three category have a various program which work for collection data.

Data is collected on area wise or update according to problem, risk, risk category, solving date, finding date, evaluation of problem, types of abnormality and its sop & FLRA.

Primary Data is collected on every day basis from different area, these data are doing date wise, then on topic wise which is defined in our table. Same table are apply for next three areas and analysed data between them.

S. n.	Plant area	Date		Risk Identification			Risk Assessment				Risk Controlling			
		In	Out	Tag colour	Types of Abnormality	Observation & risk Category	Engagement	SOP	OPL	FLRA	TPM			
											A M	P M	5s	H S E
1.	Turbine													
2.														
3.														
4.														
5.														

Table-3.1 (TPM & Risk Data Analysis Table)

In another way one different type of data collected, this collecting have a for increasing plant performance, new ideas apply for batter and safe operation. According to in program we are collect information as a kaizen, suggestion from our employee, operators. Engineers. These valuable new ideas are analysis by our senior team per week after analysis it will be apply under TPM Program. These suggestion can be a technically improvement, safety improvement, and about HSE and all area which given a height of performance of plant. By the Table can be understand my weekly suggestion.

S. No.	Plant Area	Date	Suggestion	Kaizen	TPM				
					F M	Q M	P M	Early Equipment Management	safety & environmental managemant

Table-3.2

Risk analysis table is collected per month data according to risk category in plant area. These table analysis on month wise. Table 3.3

S No.	Risk Category	Number of in Month

		December	January	February	March	April
1.	Low					
2.	Medium					
3.	High					

3.4 Tool and Techniques of Analysis:- In today global energy environment power plant need to consider many dimension of risk in additional to safety related risk. Our managers must integrate management of production, safety related and economic risk in an effective way. The integrated risk management (RM) approach generates benefits that include following.

Clear criteria for decision making, making effective use of investment already made in probabilistic safety analysis program by applying these analysis to other areas and contexts. Cost consciousness and innovation in achieving plant safety and Production goal. Communication improvement, more effective internal communication among all levels of the plant operating organization. Focus on safety, ensuring integrated focus on safety, production and economics during time of change in the energy environment.

For risk management of power plant data analysis used various type of method that which is defined on our method of in data collection column. In our plant for data analysis used various types of tool and techniques such as table, Flow chart, risk management frem and risk management cycle, Graf, line chart and pie chart. Tools are given are best technic for understanding risk analysis data in easy way in many direction, those techniques are given help for analysis a problem easily by showing table and pie chart.

With the help of table be can analyses comparing data of more topics in single table. according to table be can drown a pie graph or line graph which given help for understanding in at a glance.

CHAPTER-4

ANALYSIS

Data analysis is the process of systematically applying statistical and logical techniques to describe and illustrate, condense and recap, and evaluate data. An essential component of ensuring data integrity is the accurate and appropriate analysis of research findings.

My analysis on the topic power plant risk management system. In chapter 3 research design methodology and plan briefly describe by risk management or its part identification, assessment, & controlling procedure which is used in our plant. My this report based on technical data analysis which is useful study for controlling risk.

In this chapter I will discussed on actual data with the help of Table, flowchart and line & pie chart. These actual data find from our plant daily rotten work evaluation under various program and study. My analysis and study given help for progressiveness of plant production, economy and health & safety environment. These given study is a primary study.

My primary data analysis according to risk management, which divided in three category risk identification, risk assessment, risk controlling, in all 3 topics are discussed in previous chapter. In risk identification I will analysed all types abnormality of plant which is directly or indirectly effect on plant performance and safety. Risk identification categorised in 3 Category which have tag colour, types of abnormality, Observation & risk category. Risk assessment are categorised in 4 column which has Engagement, One point lesion, Filed risk assessment, Safe operating procedure, these are given four points have a useful for assessment of problem. Risk control categorised in TPM which have a 8 column and 5s& visual management, with the help of TPM Control the plant problems successfully. Also on the table have mension abnormality point according to area and problem in or out date.

Table 4.1a

S. n.	Plant area	Date		Risk Identification			Risk Assessment				Risk Controlling			
		Identification	Solving date	Tag colour	Types of Abnormality	Observation & risk Category	Engagement	SOP	OPL	FLRA	TPM			
											A M	P M	5s	H S E
1.	AOP oil leakage	03/02/020	05/02/020	Red	Minor flow	High	Y	Y	Y	Y	NO	Y	Y	Y
2.	DPP coupling sound	04/02/020	05/02/020	Red	Source of quality defects	Medium	Y	Y	Y	Y	No	Y	Y	Y
3.	PRDS line insulation	04/02/020	09/02/020	Yellow	Unsafe place	Medium	Y	Y	Y	Y	No	Y	Y	Y
4.	Dosing pump valve passing.	07/02/020	08/02/020	Blue	Source of contamination	Low	Y	Y	Y	Y	Y	N	Y	Y
WHR Boiler														
1.	Dcc chain break	04/02/020	06/02/020	Red	Source of quality defects	High	Y	Y	Y	Y	N	Y	Y	Y
2.	Dcc gearbox oil low	04/02/020	04/02/020	Blue	Basic condition not fulfilled	Medium	Y	Y	Y	Y	Y	N	Y	Y
3.	Drum gauge glass leakage	05/02/020	05/02/020	yellow	Minor flaws	Medium	Y	Y	Y	Y	Y	N	Y	Y

4.	Hammering system shear pin breck.	05/02/020	05/02/020	Blue	Source of quality defects.	Low	Y	Y	Y	Y	Y	N	Y	Y
Water treatment plant (WTP)														
1.	HCL shell Leakage.	04/02/020	07/02/020	Red	Unsafe place, source of quality defects	High	Y	Y	Y	Y	N	Y	Y	Y
2.	DCF blower is not work.	05/02/020	05/02/020	Red	Source of contamination	Medium	Y	Y	Y	Y	N	Y	Y	Y
3.	DM transfer line flange leakage	05/02/020	05/02/020	Blue	Minor flaws	Low	Y	Y	Y	Y	Y	N	Y	Y
4.	Chemical store unsafe	07/02/020	09/02/020	yellow	Unsafe place.	Medium	Y	Y	Y	Y	N	Y	Y	Y
Balance of plant														
1.	ACW Gland leakage	03/02/020	03/02/020	Blue	Minor flaws	Low	Y	Y	Y	Y	Y	N	Y	Y
2.	Scrap yard cleaning	06/02/020	09/02/020	Red	Unnecessar y items. & inaccessible place	Medium	Y	Y	Y	Y	N	Y	Y	Y
3.	AC cooling low	05/02/020	05/02/020	yellow	Source of contemination	High	Y	Y	Y	Y	N	Y	Y	Y
4.	PNV system stop	06/02/020	08/02/020	Red	Basic condition not fulfilled	Medium	Y	Y	Y	Y	N	Y	Y	Y

Above given table show the value of plant performance of week, on this table have a data of risk identification to risk controlling procedure which is analysed on the various category such as types of risk, what's a fugue tag colour, types of abnormality and apply types of maintenance for solution. These are given data of recorded in week in our plant collect weekly data for performance or risk analysis. All above given points mentions by pie chart for analysis or studying.

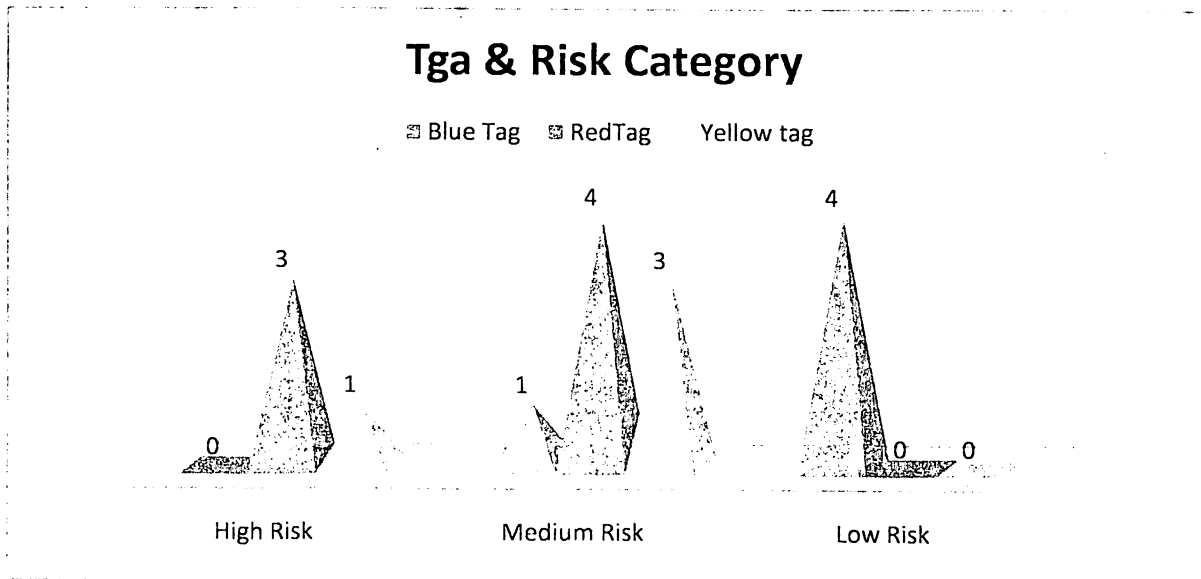


Fig1.1 Column graph between use tag or Risk category

According give weekly performance table on Column graph analysis in high risk category used 3 red tag, 1 yellow tag, and 0 blue tag. In medium risk category red tag 4no. yellow tag 3 number or blue tag one number. Same in Low risk category blue tag 4 number or red & yellow tag is zero number. These analysis of all four areas, according to grafe we can understand it not nessury that if have red tag then it will be high risk but it have a maximum possibility. For example boiler drum gauge glass leakage is not a big work but risk category high.

Same discussion on fig number 4.2 there understands on types of maintenance more used for risk controlling TPM. There show 6 time in week used Autonomous maintenance or 10 time doing job as a planned maintenance.

On Fig number 4.3 show about types of abnormality in one week have maximum or minimum so after analysis maximum 4 number abnormality found in system miner flow or Quality defects, 3 times in system found basic condition not fulfil or unsafe place, 2 times found Sources of contamination, and 1 time found Unnecessary Items in plant area on weekly report.

In fig no 4.4 show as a pie chart Risk category, in weekly report Low and High Risk in same percentage and medium risk in 50% according to number medium risk is 8 or low and high is 4-4 numbers.

Show in Fig 4.5 tag used in out of 16 place has 7 number Red tag, 5number blue tag and 4 number yellow tag used for abnormality showing.

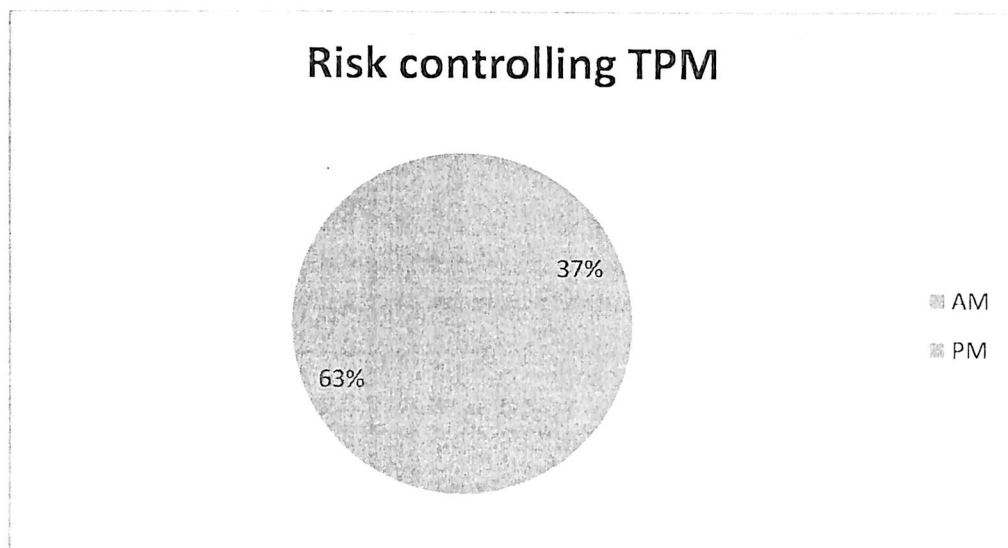


Fig 4.2

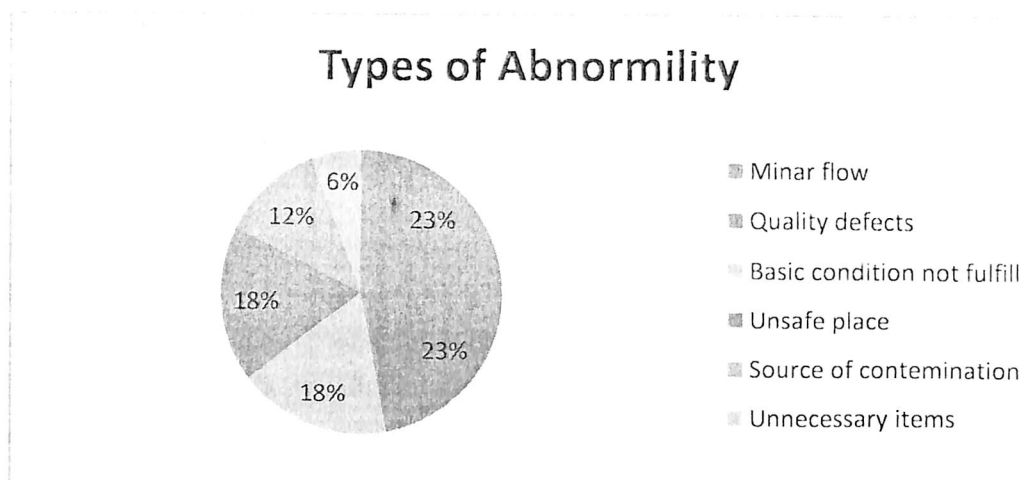


Fig. 4.3

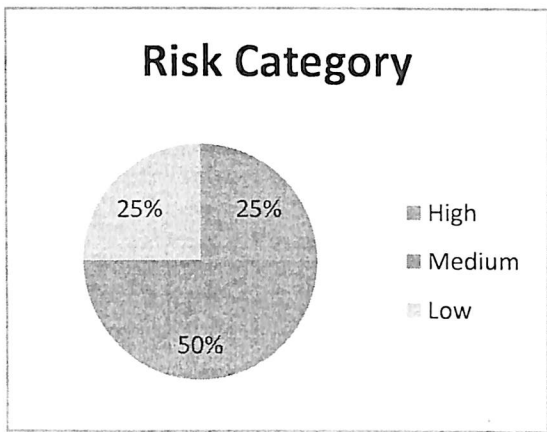


Fig. 4.4

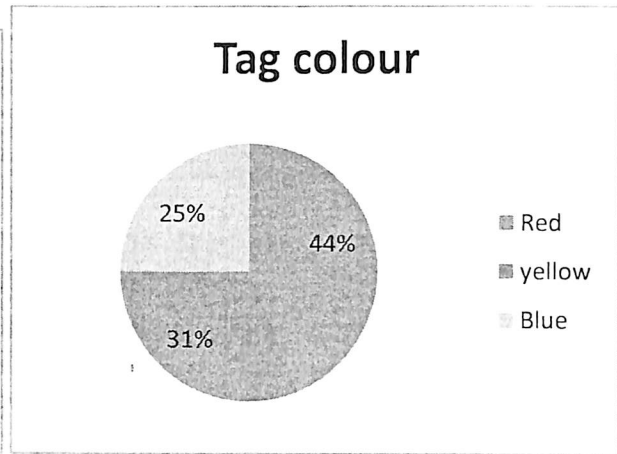


Fig. 4.5

INTERPRETION OF RESULT

My complete interpretation on Risk management category of risk management and its program which work for making healthy and controlling of risk management. After study of all topics doing present in our report systematically my after for doing 100% without untouched any subject related to my subject.

In this paper we are observe present scenario of existing safety measures and its efficiency. The risk rating of the present and possible hazard is evaluated which divide them into acceptable, tolerable and unacceptable risk level. which risk are unacceptable level there possible corrective action also recommended to improve safety measure and analysis. The result of these analysis will be of valuable to find out the consequence on emergency situation that may occur.

I will prepare our report with the help of our power plant risk controlling and safety management, for completing my dissertation report given help my plant seniors and my guide positively. With help to him I will prepared our risk data analysis report. because in our plant already making daily risk analysis report therefore with the help to these report data prepared our study report in weekly basis. Because our plant stop from 23 march therefore I will used february report data. On this report data take only primary data because with the help of primary data analysis all types of data according to risk with the old data. There have no nassesury of secondary data.

In our dissertation report I will disused on identification of risk, assessment of risk and control of risk. I also discussed on LEAP O, TPM, OPI, Kazan, types of abnormality, colour of Tag and Observation program in a report. I understand on risk management by flow diagram and TPM table also.

After complete study prepared a analysis report strongly with the help of table, in a data table mention all topic which briefly describe in our dissertation report, these topics result write on our daily and weekly report. Except of data table data also compared by column graph and pie chart which is given help for easily analysis. With the help of table doing analysis about number of types of abnormality used in plant area also analysis on risk analysis and types of TPM used in maintenance.

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