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## EXERCISE OF CADRE COORDINATION BY WORKMEN BY VIRTUE OF PROPER TRAINING AT OPEN CAST MINES AT NORTHERN COALFIELDS LIMITED, SINGRAULI (MADHYA PRADESH)

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### ABSTRACT

*The working mines of Northern Coalfields Limited, Singrauli was started in year 1977 with an aim to satisfy the increasing demand of energy of India. It is one of the nine sister subsidiaries of Coal India Limited Company. In mid 1970s the major machineries and technologies were procured by both the superpowers of the time, the USA and erstwhile USSR. Having a long life with warranty the both superpowers contributed the major machineries to activate the working of the mines. And this process continued with expansion of gauge to procure more sophisticated machineries and technologies from various other countries too as Germany, United Kingdom, France, Japan etc. All these machineries have different parameters for handling them. These parameters are "Very similar" but not "exactly same". But with developing of "Common Parameter" to handle all the machineries and proper training at "Vocational Training Centers" the workmen have been made competent enough to handle the same machineries of different origin as well as different machineries of same origin nation too. This has made the NCL Company as one of the largest profit making companies among public sector undertakings as well as of CIL subsidiary too. The mechanism of cadre coordination has initiated a new modus operandi to work with absolute safety and brilliant "Technological synchronization" even in the toughest working situations by the workmen.*

### KEYWORDS

Technological Synchronization; Material Monetary Resources; Cadre-Coordination; Non-Road Moving Vehicle, Experience Reckoning.

### INTRODUCTION

The Northern Coalfields Limited [N.C.L.] Company is one of the subsidiaries of the Coal India Limited Company. The uniqueness of the N.C.L. Company is that it is a conjunction of mines which is having all the 100% working mines as opencast mines. In addition to this the mines are designed to be fully mechanized mines. The working mines of NCL Singrauli is being operated with coordination of many departments (cadre) together as Mining (for mining duty), Excavation (Handling of Machineries), Electrical & Mechanical (for maintenance of all machineries of mines), Telecommunication (for handling communication devices used in mines), Materials Management (Inventory Stockpile), Sales- Control and Planning (for E-Auction), Merry-Go-Round Railway (for coal transportation to nearest thermal power plant). The mines are being operated for production resulting into financial profit with brilliant coordination of workmen of the company. The major work as told by experts in working mines is to excavate out the coal for processing. And it is done by help of operating heavy mining machineries and blasting of explosives every day to remove the overburden and to excavate out the coal with proper coordination.

### REVIEW OF LITERATURE

The "Material Monetary Resources" are the key factors for smoothly operating any working mines. Either the mines are for coal excavation or for any other mineral production, the basic methodology and the machineries are almost common in use. The "Safety Audit" is one of the most essential factors for "Zero Accident Zone" and that can be only achieved with regular exercise of the safety provisions with perfect training being imparted. The various specialized cadres are working together with different machineries together at a time for overall production. These cadres are performing smooth due to promptness and perfection in working of the workmen. As the major of the personnel engaged in the operating mining activities are workmen only from different cadres. It is the well grooming policies of the training imparted by "Vocational Training Centre" that the workmen are competent enough to handle the different machineries for same work as well as for different work at the same time with best mutual "Cadre-Coordination". As found that the world's third largest mechanical machine "Dragline", the heavy "Non-Road Moving Vehicles" as "Dumpers", the implantation of explosives by modern technology of "Sight Mixed Slurry" are being operated by trained workmen. The Shovel machines in the visited area were coded as "B-7" and "B-0". The experts made acquaint that the shovel "B-7" is a Russian model [USSR model] procured in early 1982 while the "B-0" is a Japanese model being procured in mid 1990s. The "Dragline" machine which is being handled by workmen only is a British model of machinery. Similarly the overburden transporting "Dumpers" are from USA, Australia, United Kingdom (Great Britain). And finally many of the "Shovel" Machines which are engaged to load and off load the coal are manufactured by Japanese Technology. The workmen have well amalgamated the different parameters of machineries to a "Common Scale Parameter" to perform smoothly. These developed "Common Scale Parameter" to operate the machineries are "not exactly same" but "extremely similar" to each other for smooth and harmonic performance of the machineries in working mines.

### IMPORTANCE OF THE STUDY

The working mines of Singrauli area are first fully mechanized opencast coal mines of India. These mines are the prime source of raw material provider in form of coal to National Thermal Power Corporation to produce electricity and satisfy the demanding energy needs of country. These mines have many heavy machineries and mining technologies being implemented from many other countries. And it is a matter of appraisal that the workmen are being able to handle these all machineries all together all around the clock throughout the year with a brilliant coordination of handling the various machineries and technology together.

### STATEMENT OF THE PROBLEM

Many new coal patches have been allocated to be operated nationwide to satisfy the growing demand of energy. At this junction a lot of machineries and sophisticated technologies are to be procured in future in the operating mines. These technologies are being procured from different countries as well as different firms of the same countries too. While the technology is procured from different countries then the "Handling Procedure" of the machineries is different for the same work, as well as the situation is almost same for the same machineries manufactured from different firm of a same country. For example the heavy transportation machineries from USA works with left hand drive as well as on measures of electricity is in "Volts". While on other hand the machineries being procured from erstwhile USSR (Union of Soviet Socialistic Republic) have the right hand drive and have the measures of electricity

transformation in "Watts" and in few models in "Ampere" too. Similarly in modern context to start up new operating mines the most modern mining machineries and technologies are needed and the problem may arise for harmonic performance of work through machineries to excavate out coal. The already practiced working modus operandi of workmen will be definitely a precedence to start up new functional mines with modern machineries of various parameters for same as well as different work.

## OBJECTIVES

To identify the working methodologies of cadre coordination of workmen to achieve the production target.

## HYPOTHESIS

To identify the interlinked policies that enables the smooth and continuous harmonic working mechanism in active working mines being operated by majority of workmen.

## RESEARCH METHODOLOGY

The method of data collection was absolutely primary data. A visit was made to the working mines of Jayant Project. The project is a functional productive unit of the Northern Coalfields Limited, Dist of Singrauli in Madhya Pradesh. The Jayant Project is one of the largest working mines in terms of the Coal Production in India. The mines of N.C.L. Singrauli are one of the oldest open-cast working mines in India. The visit to operational blasting site was approved to be visited by Administrative Authorities at West Section of the working mines of Jayant Project. While it was about one hour left in hand, the call was made by the experts and the senior administrative authorities to report to the West Section. While moving towards the working mines which is located about 20 kilometers from the residential colonies, it was found that a lot of greenery has been implanted as an environmental care measure in the route to the mines. The design of colonies and their maintenance is done "Civil Department (Cadre)". By Moving ahead the mobility of traffic movement suddenly reduces as the restricted and the hypersensitive zone has started. The zone is the pathway to move to the functional working mines and only the permitted vehicles are allowed to move inside. In parallel to the active road there is a starting separate road starts for movement of only heavy machineries. In these separate roads for the machineries the small vehicles are not permitted to move in. The cloud due to dust in atmosphere affects eye and respiration. The cloud has emerged from the functional working mines and the coal being excavated out. In the pathway the "Regional Store" of the working was found. It was told by the guiding experts that the complete inventory management and the stockpile needs of the running and working mines are being preserved in the Regional Store so that the required items can be supplied to the working site. This concept in practice is exercised to make a "Zero Delay" supply of all mining items to the demanded working site. Further the items required in mines are being kept in store in ample amount to avoid any shortage. The "Regional Store" is operated by the "Materials Management Department (Cadre)". While moving ahead it was found that the giant size working mines was divided into two sections, the East Section and the West Section. Both the sections are being handled to excavate out the soil and the coal chunk is being harvested from between both working sections. The coal is being received from the working unit named the "Central Pit". After crossing the final security post the final move was made to the working mines site. It was noticed that a lot of spare parts in form of scraps were kept unused. The security gadgets as helmet and shoes are being finally checked at the final entry port of mines. The safety gadgets as helmet and shoes must be even to be wear inside the moving closed vehicle to avoid any form of risk. So this is a positive sign of WPM that strict security measures are being followed. The final start of absolute barren roads stated. This barren roadway is found to be over burdened by soil, but these soiled roads were well pitched. As told by the experts that boundaries are being pitched for safety reasons from both the sides of the road. Further boundaries were also wired with strong and heavy metallic wires. While moving ahead it was found that a huge machinery named as "Girder" was moving continuously for leveling and making the roadways to mines smooth. This is a continuous and all around clock job so as to make a smooth connectivity to the mines from the residential area. As due to the heavy quarry continuous all around the clock the roads get damaged and dumped also at many places.

## RESULTS & DISCUSSION

While moving to the working mines even from the colonies, it was strictly instructed by the senior authorities to wear the helmet even inside the jeep as a precautionary measure. And this is mandatory for every person who enters the working mines. And this provision is made to avoid all forms of risk and injury to the workmen of the mines. While leaving the residential colony and entering the mines the railway track was crossed by an over bridge. It was told by the expert that the working mines have its own small distance railway track to transport the excavated coal to the nearby thermal power plant. This reduces the transportation cost in long run of the operational mines. After crossing the railway bridge the "Artificial hill" which is also technically termed as "Over-burden" was seen. These "Over-Burden" hills are created by the excavated out soil over the coal chunk. Immediate after the end of the bridge on the left side while moving to the mines a running unit named as "Central Work Shop" is seen. The "Central Work Shop" as told by experts is a Central junction of all the working mines of the NCL Project, where all the machineries come for repairing and maintenance. The central workshop is a centre which enables to reduce the "Leads Time" of the maintenance of machineries. In the front of the "Central Work Shop" the obsolete spare parts are being displayed as an insignia of the working unit.

## FINDINGS

While moving to the pathway a ceremonial pond on left was found to be located in the periphery of the "Vocational Training Centre". The "Vocational Training Centre" is an organization which exercises the Training, Development and Refresher cum orientation courses for workmen of the NCL Company. Also the Vocational Training Centre enables and prepares the workmen to make them competent enough to handle the various heavy machineries in working mines. It was told by experts that the smallest dumper has a capacity to transport a minimum of 85 tons of load at a time. And in present working mines in India the range of Dumpers in terms of capacity is from 85 tons to 210 tons. These heavy and extreme costly machineries are being operated by workmen of "Excavation Cadre". It was very interesting to know that the minimum height of even smallest dumpers is equivalent to a 3 storey buildings height. The tires of Dumpers do not have any tubes, as they are operated from vacuum pressure and known as "Tubeless tires". In technical terms as told by experts the Dumper is easier to be operated than to operate a "Video Game". The reason behind is the extreme high and sophisticated technology being induced in the machinery, which makes it the best transportation machinery for logistics movement of the mine products. While preparing to finally enter into mines it was found the transit camp was surrounded by a deadline ropeway. The deadline ropeway is an indicative barrier which prohibits any individual to cross it, so as to avoid causality. But if any accident occurs beyond this line then no claim of compensation could be made on company. The transit camp is a junction which remains active 24 hours a day for change of duty shifts for workmen and also executive. The transit camp is affected with heavy noise pollution being made by the movement of heavy machineries. Finally it was indicated to the final moment to proceed to the working mines to capture the real tough and hazardous conditions of the workmen. The walkie talkie was put on in continuous mode to be vigilant all around the mines for "Barrier free communication". These telecommunication gadgets are being maintained and being operated by "Telecommunication Department (Cadre)". It was found that for the blasting purposes the explosives are being implanted by special compartmentalized trucks that use to fill the drilled holes with semi-viscous fluid technically called as "Sight Mixed Slurry". The same is mixed in a fixed proportion as per directions of the experts. The "Sight mixed Slurry" is handled by workmen of the "Mining Cadre" as per prescribed norms. The drilled holes for the explosive are pierce in the working sites by the "Drilling Machine" and the same is being operated by workmen. The "Drilling Machine" is also monitored under portfolio of "Excavation Cadre". Prior a few minutes before blasting the heavy machines named as "Shovel" were being shifted to the safe position to avoid any damage due to blasting. As told by the experts of the working mines the big machineries are being called by code names. The Shovel machines in the visited area were coded as "B-7" and "B-0". The works of these "Shovel" Machines are to load and off load the coal. The Shovel machine is monitored by workmen of "Excavation Cadre". The "Electrical and Mechanical Cadre" plays a crucial role in maintenance as well as providing continuous electricity supply and transformation to all machineries in mines as the location of machineries changes in 24-48 hours as per demands of coal chunk to be excavated out. It was found that soon with help of indications and symbols by a workman the shovel operator marched to the safe position to assemble in secured zone. As a part of Instant



planning it was found that the experts in the moving jeep gave instructions to have ample space to move dozers to proceed safely. Finally as a final check up the blasting site was visited. It was found that a complete area of 50 square kilometers was packed with the explosives and connected with fuse wires and cast-boosters. In between the working mines the movement of the "Dragline" machine was observed. The "Dragline" machine is an extremely prestigious and world's third largest machine till date and is being used to excavate out the overburden soil as well as coal. It was observed as well as later explained by the experts also that the "Dragline" machine which is the world's third largest working machine is continuous functional in working mines. This machinery use to get stopped for a few minutes to avoid any form of risk due to jerks caused from the explosions of the mines. The "Dragline" as told by experts costs on an average to 10-15 million US dollars in present global market. Also the working mines of N.C.L. Singrauli have the highest number of "Dragline" machineries in comparison of all sister subsidiaries of Coal India. Also the "Dragline" in the company is being procured from U.S.A., Erstwhile U.S.S.R. and also from U.K. The movement of "Dragline" and other heavy machineries are coordinated with help of E-Governance in communication. As well as it is the best working reference of coordination and team work of Workmen in any industry. The "Dragline" machine is also monitored by "Excavation Cadre". After the blast the workmen came out from the safety zone to the working zone and all the working machineries were found to get reactive in their work within five minutes after blasting. *This is a positive shade of WPM that is the promptness of workmen.* Later the final clearance was made that every aspect related to security was confined to be secured. At the end the working report were assimilated and the complete gist was verified for completion of report. This overview gist expresses the healthy status of "Workers' Participation in Management in Policy Making" as the policies are well executed as well as more healthy policies can be formulated for swift implementation. As well as a "no-causality" report was also counter verified. And finally one more security clearance was granted before the duty hour is declared to be finished. These steps of duty hours are exercised continuous for 24 hours all around the calendar year in phases of eight hours' shift of each.

## RECOMMENDATIONS

By selling the scraps a good amount of resell financial profit can be earned. While moving it was found that a few useless cranes and machineries were left as a huge chunk of scrap. These obsolete machineries were found to be dead in performance and they consist to be thousands of tons in weight. Since the all sister subsidiaries of Coal India are now practicing Electronic-Auction (E-Auction) for the same the obsolete bulk scrap can be auction to the buyers as these obsolete machineries are occupying the space of the mines which hampers the free movement of vehicles as well as it will definitely create a good financial profit to the organization.

## CONCLUSIONS

The fully mechanized machineries as "Dumpers", "Dozer", "Shovel", "Girder" in the mines are operated by "Workers". The proper training at "Vocational Training" Centre enables the "Workmen" to operate these extreme huge machineries to perform smoothly. The experts also told that the cost of one single "Dumper" is 800 to 1000 million INR. And the cost increases with increase in capacity. As told by experts The "Dumper" is almost 3-4 times heavy than a battle tank in weight. And it needs a lot of experience and balance to operate "Dumper" in the working mines. The "Dumper" comes under category "Non-Road Moving Vehicle". And for the same category a separate pathway is made in the working mines. The importance of experience of workmen was found after arrival of the hosts with welcome of hosts with "Lemon Tea". As a share of Experience statement from a workman it was told that "Lemon Tea" is being used all day so as to curtail out sleepiness and neuron-rigidity. Also if any stress is there then it is eliminated out. Also in addition to this a workmen spoke that "Lemon Tea" reduces chances of milk to be spoiled due to dust or heat of mines. The movement of machineries is majorly done by workmen following the working on the signal optics. It was made aware by the working experts huge ammeters are being established to supply continuous uninterrupted electricity to the heavy machineries. Finally an intimation signal was given with help of lights to leave the place as soon blasting may take place. After the same the complete periphery of mines was rechecked by patrol of experts so that no accident may happen. Regular and continuous exchange of reports and feedbacks to practice the security measure to avoid all forms of risk. This mechanism proves the concept of "Quality Circle" in practice with successful impact. It was noticed that to work in the blasting region is one of the most risky and robust form of work. It was told by the experts that the present explosive (Sight mixed slurry) is multi times more powerful than traditional explosives as Dynamite and RDX. In the final moment the clearance and recheck up was made in a periphery of 500 meters so that no one may remain in the blasting zone. It was found to be a very hard humanistic condition for work for the complete cycle of preparation for the blasting for the coal excavation. After the complete check up the blasting took place and the complete area of 50 square meters was blown up. It was observed that the machineries were placed at safe positions as to avoid any form of risk of damage to the machineries.

## SCOPE FOR FURTHER RESEARCH

The coal is the support line of the energy production in India presently and it will be the biggest source of energy production till the substitute of energy is found. The energy especially in form of electricity is the prime form of energy provider to all the jurisdiction of industries and agriculture. The Indian agriculture is mass supported by the proper irrigation and water to cultivate lands. And the prime source of electricity production is coal. For the same all life lines are directly or indirectly dependent on the coal industry in present era. In the environment where the atmospheric temperature was 22 degree Celsius it was found that the temperature of mines was 34 degree Celsius. This is a very hard and realistic working conditions being faced by the workmen. Further the "Experience Reckoning" of workmen can be an important tool to impart training to new workmen recruited for handling heavy machineries in new working mines to be operated. More explorative research can bring out more feasible policies and methodologies by which the performance of workmen will be more secured and productive. The feedback collection and experience record of workmen who operate same machineries as well as different machineries will be a fruitful outcome to enhance the work performance of workmen.

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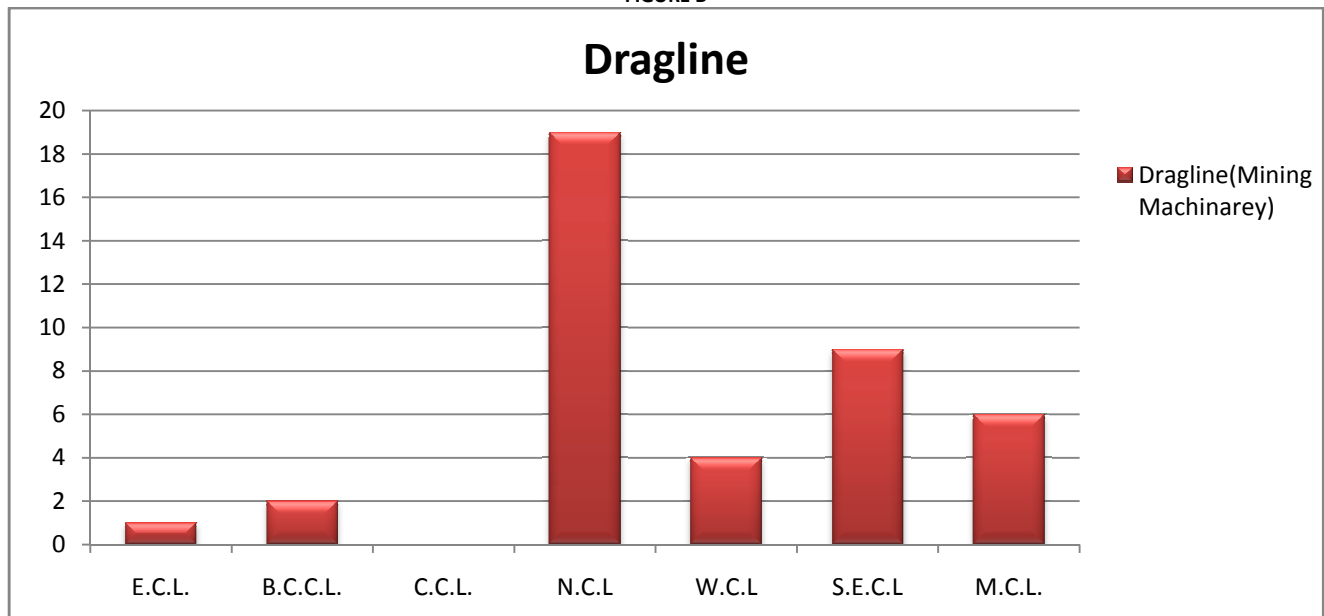
## FIGURE

FIGURE A



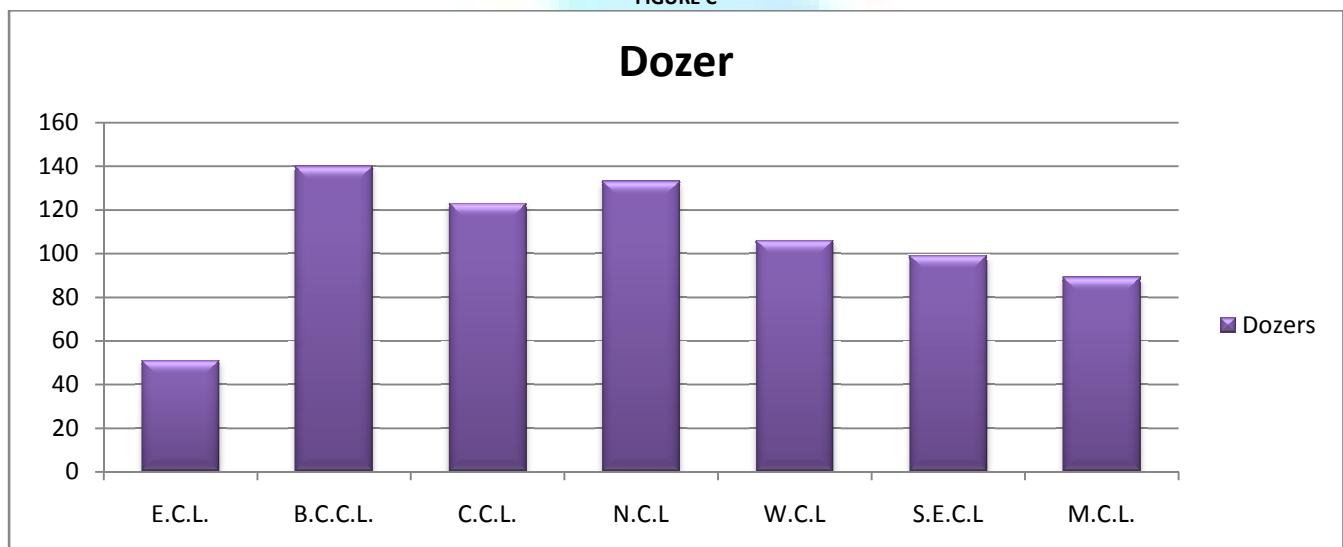
A caption from working open cast mines at Jayant Project, Northern Coalfields Limited Singrauli (Madhya Pradesh). The Code "1" indicating the workmen in field communicating with wireless signal and manual indication signal with other workmen operating heavy machinery indicated in Code "3". The Code "2" indicating the "B-7" Shovel machine of Russian Model and "B-0" is indicated by Code "4" which is a Shovel of Japanese model. The Code "5" indicated the sophisticated Dozer of United Kingdom (British origin).

FIGURE B



A comparative statistical representation of Dragline Machinery in all nine sister subsidiaries of Coal India Limited. Out of which the highest number of Dragline machines (total nineteen) are working in the NCL Singrauli, Madhya Pradesh. Source:- Angar Monthly Newsletter, Indian Institute of Coal Management, March 2008, Edition-11, Page-2

FIGURE C



A comparative statistical representation of operating Dozers in all nine sister subsidiaries of Coal India Limited. Out of which the second highest number of Dozers machines (total 130) are working in the NCL Singrauli, Madhya Pradesh. Source:- Angar Monthly Newsletter, Indian Institute of Coal Management, March 2008, Edition-11, Page-2.

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