SAFETY MANAGEMENT PLAN

Coal India Ltd.

CHHAL OPEN CAST (SEAM III) PROJECT (6MTY)

RAIGARH AREA

SECL

CONTENTS OF SAFETY MANAGEMENT PLAN:

SAFETY MANAGEMENT PLAN

PREAMBLE

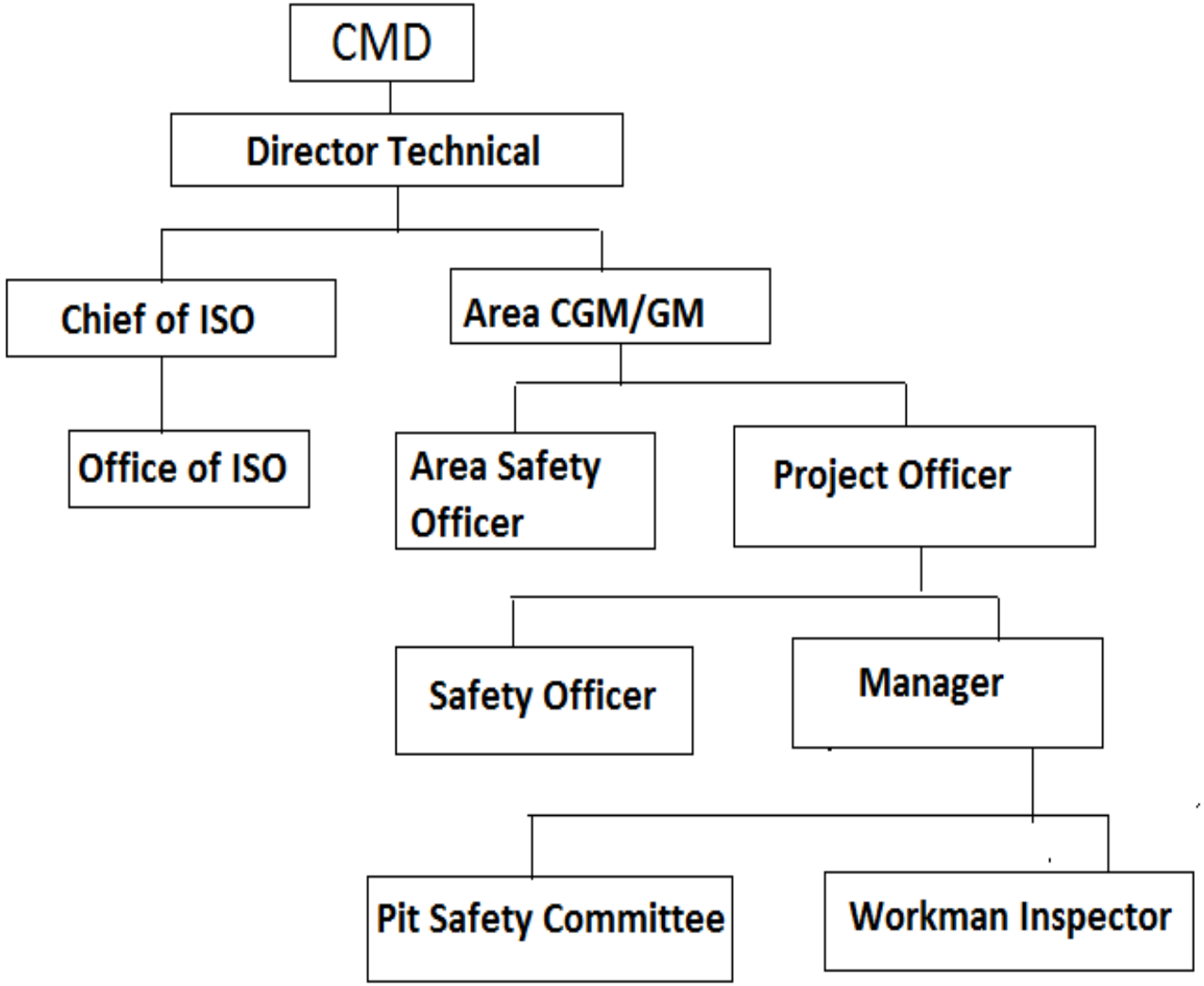
Mining , by its very nature,is a hazardous industry. All over the world, many countries have proven that the risks of mining can be controlled to acceptable levels through effective safety and health management systems – supported by formal risk management processes that identify hazards, assess and rank risk, determine control measures and monitor effectiveness of the controls.

The ninth and tenth Conference of Safety in mines recommended adopting Risk Assessment as a tool for development of appropriate health & safety management systems in Indian mines. The eleventh Conference further recommended that the managements of every mining company should adopt the process of safety management system and commit itself for proper formulation and implementation of the same in totality.

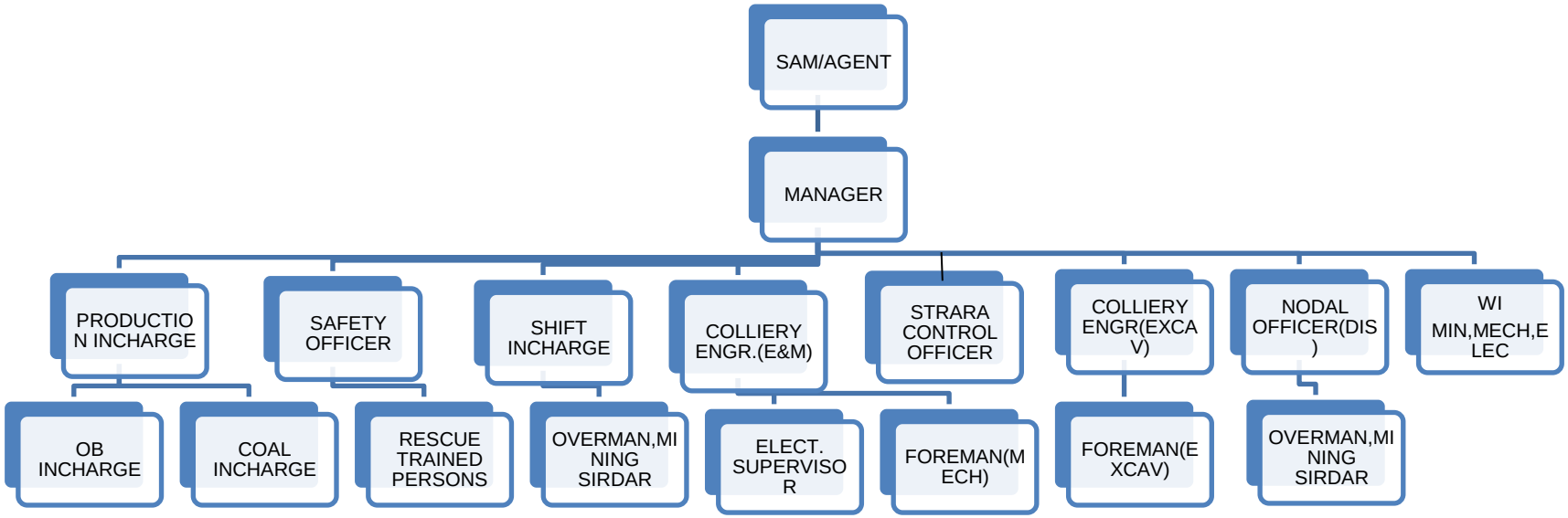
Drawing inputs from inference draw from several workshops on "Risk Assessment" in Indian mine conducted by DGMS, a document on "Safety Management System – A guideline for implementation" was prepared and circulated as DGMS (Tech) (S&T) Circular No. 13 of 2002. Another guideline in this regard titled "Safety Management System – Provision for auditing and review" was issued by DGMS (Tech)(S&T) Circular No. 02 of 2011.

Keeping in view above, a Safety management plan for Chhal Opencast (SeamIII) Project (6MTY), Raigarh Area of M/s S.E.C.L was developed by the team of Chhal Opencast (SeamIII) Project (6MTY) with facilitation from DGMS, Raigarh Region and I.S.O of M/s SECL in the year 2012 first time and updated & reviewed on 31/3/2016, 09/08/2017,24/7/2018, 14/11/2018, 01/03/2019. 01/09/2019. This is the 8th review edition as on 19.08.2020.

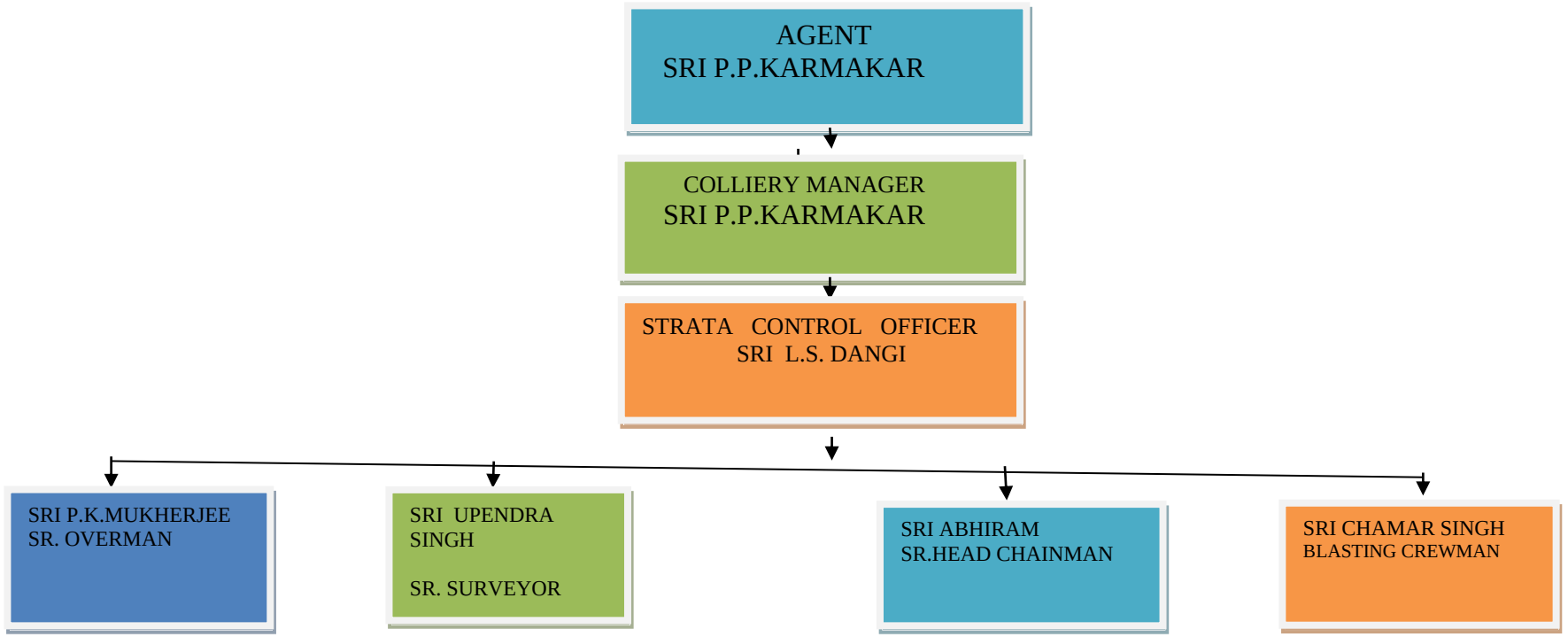
Organisational Structure of ISO from subsidiary Level to mine Level



ORGANISATIONAL STRUCTURE FOR SAFETY OF CHHAL OPENCAST(SEAMIII)PROJECT(6MTY)



STRATA CONTROL ORGANISATION OF CHHAL OPEN CAST (SEAM III) PROJECT (6MTY)



Safety policy of the Company

Safety Policy: Safety is given Prime importance in the operations of CIL as embodied in the mission of Coal India Ltd. CIL has formulated a Safety Policy for ensuring safety in mines and implementation of which is closely monitored at several levels.

1. Operations and systems will be planned and designed to eliminate or materially reduce mining hazards.
2. Implements Statutory Rules and Regulation and strenuous efforts made for achieving superior standards of safety.
3. To bring about improvement in working conditions by suitable change in technology.
4. Provide material and monetary resources needed for the smooth and efficient execution of safety Plans.
5. Deploy safety personnel wholly for accident prevention work.
6. Organize appropriate forums with employee's representative for Joint consultations an safety matters and secure their motivation and commitment in Safety Management.
7. Prepare annual Safet Plan and long term Safety Plan at beginning of every calendar year, unit-wise and for the company, to effect improved safety in operations as respective geo-mining need to prepare the units for onset of monsoon, to fulfil implementation of decisions by Committee on Safety in Mines and Safety Conferences and to take measures for overcoming accident proneness as may be reflected through study of accident analysis,keeping priority in sensitive areas of roof-falls, haulage, explosives, machinery etc.
8. Set up a frame work for execution of the Safety Policy and Plans through the General Managers of Area, Agents, Managers and other Safety personnel of the units.
9. Multi-level monitoring of the implementation of the Safety Plans through Internal Safety Organization at the company headquarters and Area safety Officers at area level.
10. All senior executives at all levels of management will continue to inculcate a safety consciousness and develop involvement in practicing safety towards accident prevention in their functioning.
11. Institute continuous education, training and retraining all employees with the accent placed on development of safety oriented skills.
12. Continue effort to better the living conditions and help of all the employees both in and outside the mines.

INTRODUCTION

BRIEF INTRODUCTION

Chhal Opencast(SeamIII)Project(6MTY) Mine is situated in Raigarh District of Chhattisgarh state. The mine is about 18 km away from the Kharsia railway station on the Mumbai -Howrah main railway line. It can be approached by Dharmjaigarh-Kharsia national highway. The mine is situated between the longitudes - 83degree06 min10sec to 83degree09min10sec and latitude 22degree04min40sec to 22degree06min21sec. The mine has four quarries namely Quarry no.1 and Quarry no. 2, Camp side patch & Camp Patch. The extraction of the coal from quarry no.1&2 is completed .At present the extraction of coal is being done from Camp side patch & Camp Patch .

Date of opening of mine : 24th April 2006(Quarry no. 1)
Coal Production started : 27thseptember 2006
Avg.OB Removal : 21332 cu.m. per day
Avg. Coal production : 43589Te /day
Stripping ratio : 1:3.64
OMS : 12.73

GENERAL INFORMATION

1.Name of the mine : Chhal Opencast(SeamIII)Project(6MTY) Mine
2.Name of seam: VI ,VT_1,VT,VB ,IVT,IVB, and Local Seam
3.Grade of coal: SEAM IVT,IVB - G12, SEAM VT_1,VT,VB G-15, SEAM VI-G16 and Local Seam-G16
4.Avg.Dip: 1 in 7
5.Extent of mine: Along DIP – 1500M
B Along Strike – 1500 m
C Depth – 10 M to 130 M
6. Thickness of coal seam : Present working

CAMP PATCH (BH NO.116)				CAMP SIDE PATCH (BH NO.115)			
Seam	Thickness	Depth	Parting	Seam	Thickness	Depth	Parting
VI	6.19	27.91	27.91	IV_T	0.65	65.50	65.50
VT_I	0.63	59.57	25.47	IV_B	0.64	71.00	5.50
VT	3.87	83.85	3.65				
VB	9.05	77.53	9.81	Local	3.08	95.54	24.54

7.Thickness of Overburden

(Camp Patch)	(Camp Side Patch)
A. Top Cover – 27.91 M	A. Top Cover-- 65.5 M
B. VI to VT_I – 25.47 M	B. IV_T to IV_B -- 5.50 M
C. VT_I to VT – 3.65 M	C. IV_B to Local --24.54 M
D. VT to VB --9.81M	

8. Average annual rainfall :- 1326 mm
9.Maximum Rainfall in a day: 173 mm on 13.08.2019
10. Balance Mineable Reserve in the beginning of the year 1st april 2020:- 144.97MT
11.River present near the mine: Mand river
HFL: 234 meters (Date :14/09/2013)
RL of opening : 252.10 meters
Length of quarry along the river: 2400 meters
Present RL of river bed : 230 meters
Details of embankment : Width at the top of embankment is 40 m and top is RL 248.81m to 264.7m . Width at the bottom of the embankment is 90 m and bottom RL is 232m to 236m . Slope is near about 40^0 from horizontal

METHOD OF WORKING

OB Removal is being done by PC and Tipper combination.The bench height is 4.0 meter to 6.0 meter. The outsourcing agencys are M/s. DCCCPL and SCCPL. Drilling in OB is done by 160mm Dia drill and blasting is done departmentally.Coal winning is being done by cutting of coal by surface miner by outsourcing agency M/s.JRT VA JV. and loading and transportation done byPay loader and tipper combination by the outsourcing agency M/s. VCTPL. Coal bench height is kept upto 4.0 meter.
Total Leasehold Area : 1342.86 hectare

MAN POWER (As on 11/04/2021)

SL.No.	DESG.	NO.
1	EXECUTIVE	16
2	MR	114
3	TR	174
	Total	**304**

List of Statutory Manpower(Executives)

1. Sri. P.P.Karmakar :- Chief Mining Engineer/ Colliery Manager (1st class)
2. Sri. S. R. Nayak :- Dy. Manager(M)/ Safety Officer(1st class)
3. Sri L.S.Dangi :- Sr.Mgr (M)/ Blasting Officer (1st class)
4. Sri P . K. Mahanta :- Dy .Manager(M)/ Overall Production Incharge (1st class)
5. Sri .Anup Singh :- Sr.Manager(M)/ Dispatch Officer 2nd Shift (2nd Class)
6. Sri. S.P. Dewangan :-Sr. Manager(M)/Blasting Officer (1st class)
7. Sri Sanoj Kumar :- Sr. Manager (M))/ Dispatch Officer 1ST Shift (1st class)
8. Sri Ranjit Awdhesh :- Asst.Manager(M)/ OB Incharge (1st class)
9. Sri.Mukund Kumar Sihna :- Asst. Manager (M) / Shift Incharge (2nd Class)
10. Sri K.Eesh Kumar :- Asst.Manager (M)/ General Shift(2nd Class)
11. Sri A.S. Rewatkar :- Sr. Officer(M)/ Shift Incharge (2nd class)
12. Sri Khageswar Sahu :- Sr. Officer(M)/ Shift Incharge (2nd class)
13. Sri Suman R. Sahu :- Sr. Officer(M)/ Shift Incharge Reliver (2nd class)
14. Sri Gobind Roy :- Colliery Engineer (E&M)
15. Sri T.K.Das :- Colliery Engineer (Excavation)
16. Sri D .Ram :- S.O.E (Excavation)
17. Sri O.P. Tiwari :- Sr. manager (E&M) / Safety Officer(Electrcal)
18. Sri. Shiv Charan Jangde :- Welfare officer
19. Dr. S.N.Mishra :- Medical Officer

LIST OF WORKMAN INSPECTOR

SL.NO.	Name	Designation	Discipline	Substitute WI
1.	Sri. N. Pradhan	Overman	Mining	Sri A.L.Porte
2.	Sri. S.S.Chandra	Foreman Incharge	Electrical	Sri Pradeep kumar Singh
3.	Sri. R.B. Chandra	Asst. Foreman	Mechanical	Sri M.Toppo

LIST OF OVERMAN , MINING SIRDAR, ELECTRICAL & MECHANICAL SUPERVISOR

SL.NO.	Name	Designation
1.	Sri R. R. Rai	Sr. Overman
2.	Sri. R.K Vishwakarma	Sr. Overman
3.	Sri. P. K. Mukherjee	Sr.Overman
4.	Sri. Vinod Murmu	Sr.Overman
5.	Sri. N.K. Sinha	Sr.Overman
6.	Sri. Pankaj Kumar	Overman
7.	Sri. Chhotu Mandal	Overman
8.	Sri. Gulab Chand	Overman
9.	Md. N. Alam	Overman
10.	Sri. A.L.Porte	Sr.Overman
11.	Sri. P.K. Kar	Overman
12.	Sri. Ghasi Ram	Sr. Overman
13.	Sri. Nanki Ram Sahu	Overman
14.	Sri. D.P. Rajak	Sr.Overman
15.	Sri. Gopal Prasad	Sr.Overman
16.	Sri. Abhinash Kumar	Overman
17.	Sri. Jageshwar Chouhan	Overman
18.	Sri. U.K.Chatterjee	Sr. Overman
19.	Sri. Sanath Kumar Patel	Overman
20.	Sri. Jeetram Patel	Overman
21.	Sri. Jayant Sahu	Overman
22.	Sri .Nityanand Pradhan	Overman
23.	Sri.Trilok Kumar Sahu	Overman
24.	Sri.Mukesh Kr. Rathore	Overman
25.	Sri Satruhanlal Kaiwart	Sr. Overman

26.	Sri Ajay kumar sahu	Sr. SCPA
27.	Sri Tej Pal Sahu	SCPA
28.	Sri. S Chakarborty	SCPA
29.	Sri. B.B. Rai	SCPA
30.	Sri . S.K. Mahto	Mining Sirdar
31.	Sri. Kunjo Prasad	SCPA
32.	Sri. K.K.Kaushik	Electrical Supervisor
33.	Sri. Salikram	Electrical Supervisor
34.	Sri. S. S. Chandra	Electrical Supervisor
35.	Sri. Pradeep Singh	Electrical Supervisor
36.	Sri. Hitesh Bhatt	Electrical Supervisor
37.	Sri. Keshar kumar	Asst. Foreman Electrical
38.	Sri. Ashis Pattanayak	Foreman
39.	Sri. Rambhoros Chandra	Foreman
40.	Sri. Ghanshyam Sharma	Foreman Incharge (Mech)
41.	Sri. Ramakant Yadav	Foreman
42.	Sri. Mahavir Jat	Foreman
43.	Sri. Pursottam Patel	Foreman
44.	Sri. Manohar Toppo	Foreman
45.	Sri.B.L. Tiwari	Foreman
46.	Sri. Rajendra Chandra	Foreman
47.	Sri. F.C. Pradhan	Foreman

LIST OF EQUIPMENTS

Sl.NO	Machine	Make	Model	CIL No.	Capacity	In use
01	Dozer	BEML	D155	G13125 G10048	320 HP	02
02	Dozer	BEML	D 355	G11960 G11961	410 HP	02
03	Grader	KOMATSU	GD825-A	12473/G411	280 HP/160mm	1
04	Water Tanker	BEML	WS 28-2	426	28KL	1
05	Pay Loader	TATA	TWL 3036	4325,	2.5Cu.m	1
		BEML	BL 200-1	10175 10176	2.5Cu.m	2
06	Crane	ACE	Rhino 60	H0746220	6 Te	1
07	Crane	ACE	ACER110C	H0746220	10 Te	1
08	Excavator	BEML L&T	LC-300 L&T300	B16092 0795	1.57Cu.m 3.0 Cu.m	1 1
09	Fire Tender	EICHER	PRO5019	HR2020T/R6018P	4500 Liter	1
10	Sky Lift	TATA	909 EX-2	MH12TRDLE-726	13 Meter	1

Crawler Mounted: Dozer and Excavator
TyreMounted: Grader, Water Tanker, Pay Loader, Crane Fire Tender and Sky Lift
Note : All machineries are powered by diesel

Sl.NO	MACHINE	CAPACITY	NO.
01	ELetric Pump	350 kw(2000GPM)/3.3kv 200kw/1000GPM/3.3KV 200KW/1500GPM/3.3KV 90KW/1000GPM/440V	02 01 01 02
02	Diesel Generator Set	7.5KVA	01

ACCIDENT STATISTICS

YEAR	ACCIDENTS			Details
	Fatal	Serious	Reportable	
2011	NIL	NIL	NIL	
2012	NIL	NIL	NIL	
2013	NIL	NIL	NIL	
2014	NIL	01	NIL	Sri Laxman Das,(pay loader operator) , 6 th June fall from pay loader ,injured left wrist.
2015	NIL	NIL	NIL	
2016	NIL	NIL	NIL	
2017	NIL	02	NIL	1) Sri T.D.Singh, Head Chainman, 1st July , fall on a small piece of boulder, injured left knee . 2) Sri Puran Singh , Welder , 3rd July, during welding work an empty drum burst 14oods burn injury both leg.
2018	NIL	NIL	NIL	
2019	NIL	NIL	NIL	
2020 (Till Date)	1	1	NIL	01.Sri Battilal Rajwade(contractual), driver of VCTPL, 20th September, got injury on his right leg as he jumped from an uncontrolled running tipper. 02. On 30.11.2020 at about 10:00 am Shri Shyam Das aged about 53 years S/O Shri Chamru Das working as water tanker operator in the contractor patch of M/S DEE CEE Coal Carriers Pvt. Ltd. sustained fatality in camp patch of Chhal OCM while his water tanker no. CG12 AU 4432 fell down from upper bench to lower bench.

PRODUCTION

YEAR	COAL(inTe.)	OBR(in M3)
2010-11	3500000	8682900
2011-12	3500000	8990650
2012-13	3500000	3026273
2013-14	3500000	5738060
2014-15	3500000	5681694
2015-16	3500000	3296722
2016-17	3500000	7747267
2017-18	3500000	5520228
2018-19	1873083.26	5632991
2019-20	1470220.86	8521560.10
2020-21	3041754.85	7470560.76

भारत सरकार
Government of India
श्रम एवं रोजगार मंत्रालय
Ministry of Labour & Employment
खान सुरक्षा महानिदेशालय
Directorate General of Mines Safety
धनबाद / Dhanbad - 826 001

No. DGMS (Tech.) (S&T) Circular no. 05 Dhanbad, Dated 2nd April 2016

To

All Owners/ Agents/ Managers of coal and metalliferrous mines

Integrated approach for development of Safety Management Plan for coal and metalliferous mines

The ninth and tenth Conference on Safety in mines recommended adopting Risk Assessment as a tool for development of appropriate health & safety management systems in Indian mines. The eleventh Conference further recommended that the managements of every mining company should adopt the process of safety management system and commit itself for proper formulation and implementation of the same in totality.

Drawing inputs from inferences drawn from several workshops on "Risk Assessment" in Indian mines conducted by DGMS, a document on "Safety Management System – A guideline for implementation" was prepared and circulated as DGMS(Tech)(S&T) Circular No. 13 of 2002. Another guideline in this regard titled "Safety Management System-Provision for auditing and review" was issued by DGMS as DGMS (Tech)(S&T) Circular No. 02 of 2011.

Successful implementation of Safety Management System in Mines would warrant sorting out perception issues among all stakeholders, and the success may depend on among others, adoption of an integrated approach.

कार्य योजना क्रमांक 01

छाल खुली खदान में एसओपी / सीओपी के क्रियान्वयन हेतु कार्ययोजना

1. खान में कार्यरत् कर्मचारी की यह जिम्मेदारी है 27ववके एसओपी/सीओपी का पालन करें।
2. खान प्रबंधक की जिम्मेदारी है 27ववके प्रत्येक कार्य के लिए एसओपी/सीओपी बनायें।
3. सुरक्षा अधिकारी का दायित्व है 27ववके सम्बंधित व्यक्ति को एसओपी/सीओपी के प्रति उपलब्ध करवायें एवं एक रजिस्टर में सम्बंधित व्यक्ति से इसकी प्राप्ति की हस्ताक्षर करवायें।
4. प्रत्येक सुपरवाईजर की जिम्मेदारी है 27ववके कार्य के दौरान इस बात का ध्यान रखें कि कार्य एसओपी/सीओपी के अनुसार किया जायें।
5. यदि एसओपी/सीओपी के अनुपालन हेतु श्रमषक्ति या मटेरियल की आवष्यकता है, तो वह कार्य योजना क्र0.02 के अनुसार प्रबंधक को अवगत करायेगा।
6. यदि सुपरवाईजर को यह पाता है कि कोई कर्मचारी जानबूझकर एसओपी/सीओपी का पालन नही कर रहा है, तो वह कार्य योजना के अनुसार प्रबंधक को अवगत करायेगा।
7. प्रबंधक की जिम्मेदारी है 27ववके समय समय पर यह सुनिष्चित करे कि ''कार्य एसओपी/सीओपी के माध्यम से हो रहे हैं या नही'' निरीक्षण करेगा/करवायेगा।

कार्य योजना क्रमांक 02

छाल खुली खदान में मटेरियल अरेंजमेंट हेतु कार्य योजना

1. खनन् सम्बंधित मटेरियल हेतु सेक्षन इंचार्ज, विद्युत एवं यांत्रिक सम्बंधित मटेरियल हेतु कालरी अभियंता एवं सर्वेक्षण सम्बंधित मटेरियल हेतु सर्वेयर की जिम्मेदारी होगी। वह सुनिष्चित करें कि खान में अगामी तीन माह हेतु पर्याप्त मटेरियल उपलब्ध हो।
2. अगामी तीन माह तक का मटेरियल उपलब्ध न होने पर सम्बंधित अधिकारी प्रबंधक को लिखित में मटेरियल की उचित मात्रा हेतु मॉग करेंगें।
3. प्रबंधक की जिम्मेदारी होगी 27ववके अधिकारी से विस्तृत चर्चा के पष्चात लिखित में इण्डेट उपक्षेत्रीय प्रबंधक को देंगे।
4. उपक्षेत्रीय प्रबंधक अपने डेलीगेषन ऑफ पावर के तहत मटेरियल की व्यवस्था करके प्रबंधक को सूचित करेंगे। यदि मटेरियल की मात्रा उपक्षेत्रीय प्रबंधक के डेलीगेषन ऑफ पावर से अधिक है, तो वह सम्बंधित क्षेत्रीय एजेन्ट को लिखत में जानकारी देकर मटेरियल प्रबंध का अनुरोध करेगा।
5. मटेरियल हेतु वित्तीय व्यवस्था की जिम्मेदारी क्षेत्रीय 27वव प्रबंधक की होगी।

6. क्षेत्रीय एजेन्ट (स्टॉफ ऑफिसर) मटेरियल की व्यवस्था कर उसकी क्वालिटी की जॉच कर उचित क्वालिटी में उचित मात्रा में मटेरियल क्षेत्रीय भण्डारगृह तक पहुॅचाने हेतु जिम्मेदारी हो

कार्य योजना कमांक 03
छाल खुली खदान में उचित मेनपावर की व्यवस्था बनाने हेतु जिम्मेदारी

1. समस्त असिस्टेंट मैनेजर, कालरी इंजीनियर एवं सर्वेयर की जिम्मेदारी होगी 28ववके अगामी एक वर्श के उत्पादन प्रोग्राम को विचार करते हुये पर्याप्त उत्पादन के प्रोग्राम को विचार करते हुए पर्याप्त मेनपावर, जिसमें अनुपस्थिति को भी विचाराधीन किया गया है। मेनपावर की स्थिति के बारे में प्रबंधक को अवगत करायें।
2. प्रबंधक की जिम्मेदारी है 28ववके उसके अधीनस्थ मेनपावर को रिअरेंज कर मेनपावर उपलब्ध करवायें।
3. यदि मेनपावर को रिअरेंज करना प्रबंधक के लिए ना हो तो वह इस बारे में उपक्षेत्रीय प्रबंधक को लिखित सूचना देगा।
4. उपक्षेत्रीय प्रबंधक की जिम्मेदारी है 28ववके अपने अधीनस्थ खानों के मेनपावर को रिअरेंज कर प्रबंधक को उचित संख्या में मेनपावर उपलब्ध करवायें।
5. यदि उपक्षेत्रीय प्रबंधक के पास समुचित मेनपावर उपलब्ध नही है, तो क्षेत्रीय कार्मिक प्रबंधक से लिखित में इसकी मॉग करेंगे।
6. क्षेत्रीय कार्मिक प्रबंधक, क्षेत्रीय महाप्रबंधक एवं कम्पनी ऑनर की जिम्मेदारी होगी 28ववके उचित मेनपावर की व्यवस्था करें।
7. सभी ठेकादार की जिम्मेदारी होगी 28ववके उचित मेनपावर की व्यवस्था करें।

कार्य योजना कमांक 04
छाल खुली खदान में ट्रेनिंग एवं रिट्रेनिंग की कार्य योजना

1. जिन कर्मचारी को ट्रेनिंग की आवष्यकता है उन्हें सुरक्षा अधिकारी चिन्हांकित कर जीव्हीटी0सी0, एचआरडी बिलासपुर, बीईटीआई कोरबा सीईटीआई गेवरा इत्यादि सीनों में नामांकित कर भेजना सुनिष्चित करें।
2. सुरक्षा अधिकारी क्षेत्रीय प्रषिक्षण अधिकारी एवं क्षेत्रीय सुरक्षा अधिकारी से सलाह कर ट्रेनिंग कार्यक्रम की रूपरेखा तैयार करगें।
3. खान प्रबंधक की जिम्मेदारी होगी कि जिन कर्मचारी को ट्रेनिंग हेतु नामित किया गया है, उन्हें समय पर कार्यभार मुक्त किया जावें।
4. सम्बंधित ट्रेनिंग प्रभारी की यह जिम्मेदारी होगी कि नामित व्यक्तियों को सही ढ़ंग से ट्रेनिंग दिया जावें।
5. सुरक्षा अधिकारी की जिम्मेवारी होगी कि सुरक्षा निर्देष सुरक्षा स्लोगन, सुरक्षा पोस्टर इत्यादि को सही ढ़ंग व सही सीन पर खान परिसर के अंदर चस्पा करवायेंगे, जिससे कि अधिक से अधिक लोगों को सुरक्षा सम्बंधित जानकारी प्राप्त हो सकें।
6. खान प्रबंधक अपने अधीनस्थ प्रबंधकों को यह निर्देष देवे कि जिससे कि उपरोक्त बिन्दुओं का क्रियान्वयन सही ढ़ंग से हो।
7. खान प्रबंधक द्वारा उपरोक्त कार्य हेतु पर्याप्त मात्रा में श्रमषक्ति व मटेरियल की समुचित व्यवस्था की जायेंगी।

8. सुरक्षा अधिकारी ट्रेनिंग प्राप्त कर्मचारियों की रिकार्ड सही ढ़ंग से रखेंगे।
9. सुरक्षा अधिकारी कर्मचारियों को दिये जाने वाले सुरक्षा निर्देष एवं सुरक्षा वार्ता का भी रिकार्ड सही ढ़ंग से रखेंगे

कार्य योजना क्रमांक 05
छाल खुली खदान में उचित गुणवतत्ता की सामग्री हेतु कार्य योजना

1. खान प्रबंधक लिखित रूप में व्यक्ति विषेश को प्राधिकृत करेंगे जो खदान में उपयोग होने वाले सामग्री की गुणवत्ता की सही
2. ढ़ग से जॉच करेंगे।
3. सामग्री की गुणवत्ता जॉच करने वाले प्राधिकृत व्यक्ति भौतिक रूप से जॉच करेंगे।
4. यदि सामग्री की गुणवत्ता जॉच के दौरान उसमें किसी प्रकार की कमी पायी, तो प्राधिककृत व्यक्ति इसकी सूचना तत्काल खान प्रबंधक को देंगे।
5. खराब गुणवत्ता वाले सामग्री की सूचना खान प्रबंधक तत्काल इसकी सूचना उपक्षेत्रीय प्रबंधक को देंगे।
6. उपक्षेत्रीय प्रबंधक खराब गुणवत्ता वाले सामग्री की सूचना स्टाफ अधिकारी (एमएम) को देंगे,जो अग्रिम उचित कार्यवाही करेंगे।

कार्य योजना क्रमांक 06
छाल खुली खदान में ठेकेदार द्वारा कार्य करवाने हेतु कार्य योजना

1. खान प्रबंधक किसी प्रकार का कार्य, जो कि ठेकेदारी द्वारा करवाना है, उसके लिए सर्वप्रथम कार्य की योजना बनायेंगे।
2. खान प्रबंधक योजना बनाने के उपरांत उक्त कार्य हेतु एक नोटषीट बनायेंगे, जिसमें कि उक्त कार्य सम्बंधी आवष्यकता, सीन, खर्च का विवरण इत्यादि दर्षायेंगे।
3. खान प्रबंधक द्वारा यह नोटषीट अग्रिम रूप से कम से कम 03 माह पूर्व अपने कार्यालय से उपक्षेत्रीय प्रबंधक के कार्यालय में भेजना सुनिष्चित करें, जिससे कि आगे की कार्यवाही समयसीमा के अंदर आसानी से पूर्ण की जा सकें।
4. नोटषीट पर अग्रिम कार्यवाही जारी रखते हुए उपक्षेत्रीय प्रबंधक समीक्षा एवं सूक्ष्म परीक्षण करेंगे तथा अनुमोदित कर वित्तीय व्यवस्था हेतु क्षेत्रीय 29वव विभाग में भेजा जावेगा।
5. क्षेत्रीय 29वव प्रबंधक एवं अन्य प्राधिकृत अधिकारियों द्वारा पुनः उस नोटषीट पर समीक्षा किया जायेगा तथा उस कार्य के लिए वित्तीय प्रबंध किया जायेगा।
6. स्टॉफ अधिकारी (खनन्) उक्त कार्य हेतु दिये गये नोटषीट पर कम्पनी नियमानुसार निविदा जारी करेंगे।

कार्य का कियान्वयन –

1. निविदा जारी होने के बाद सम्बंधित ठेकेदार उस कार्य को करने के लिए खान प्रबंधक के समक्ष अपना लिखित आवेदन प्रस्तुत कर साईट प्रदान करने की अनुमति मॉगेगा।
2. तत्पष्चात खान प्रबंधक द्वारा अनुमति प्रदान होने के बाद सम्बंधित ठेकेदार निर्धारित समयावधि के अंदर अपना कार्य सम्पन्न करेगा।
3. कार्य को पूर्ण करने के लिए एनआईटी/निविदा के अनुसार ठेकेदार को प्रबंधन द्वारा समुचित साधन व्यवस्था करायी जायेगी।
4. समुचित श्रमषक्ति और पर्याप्त मात्रा में सामग्री ठेकेदार द्वारा प्रदत्त करायी जायेगी।
5. ठेकेदार उक्त कार्य को करने के लिए प्रषिक्षित कामगार (व्हीटी0 एवं पीएमई धारित) उसे ही कार्य पर लगावेंगे।
6. ठेकेदार द्वारा जो मषीन को कार्य पर लगाया जायेगा, वह उस कार्य के लिए योग्य हो।
7. ठेकेदार उस कार्य को करने के लिए एक पर्यवेक्षक नियुक्त करेगा।
8. खान प्रबंधक उक्त कार्य के लिए एसओपी तैयार करेंगे।
9. कार्य के दौरान खराब कार्यकुषलता दिखाई पड़ता है, तो प्राधिकृत पर्यवेक्षक तत्काल खान प्रबंधक के संज्ञान में लायेगा, जिससे कि खान प्रबंधक आगे की कार्यवाही कर सकें

कार्य योजना कमांक 07
छाल खुली खदान में अनुषासन बनाये रखने हेतु कार्य योजना

1. खान प्रबंधक की जिम्मेदारी है कि खान में काम करने वाले प्रत्येक कर्मचारी अनुषासन बनाये रखें।
2. खान प्रबंधक इसके लिए सम्बंधित अधिकारी एवं पर्यवेक्षकों को उनके कार्य सम्बंधित कर्मचारियों की सूची बनाकर आवष्यकता अनुसार बटवारा करेंगे।
3. सम्बंधित अधिकारी अपने अधीनस्थ सुपरवाईजर/पर्यवेक्षक एवं कर्मचारियों के कार्य कौषल एवं उनके अनुषासन के लिए जिम्मेवार होगें।
   अ. प्रत्येक कर्मचारी को कार्य सम्बंधित ट्रेनिंग/रिट्रेनिंग की व्यवस्था की जायेंगी (वर्क प्लान 04)।
   ब. पर्यवेक्षकों/सुपरवाईजर को स्ट्रक्चरल ट्रेनिंग/रिट्रेनिंग की व्यवस्था की जायेगी (वर्क प्लान 04)

स. कार्य सम्बंधित प्रोसेस, उसके परिणाम को समय–समय में चर्चा एवं विवेचना की जायेगी

द. कार्य सम्बंधित दैनिक सुरक्षावार्ता देना है।

4. समस्त कर्मचारी काम के बटवारे के तुरन्त बाद अपने सम्बंधित पर्यवेक्षक के साथ अपने कार्य के लिए रवाना होगें।
5. प्रत्येक कर्मचारी समय से अपने काम पर जायेंगे ताकि उनके द्वारा किये जाने वाला काम समय पर किया जा सके, जिससे वे अन्य किसी कार्य के लिए बाधक न बनें।
6. काई सम्बंधित जरूरत के औजार, मषीनी पूर्जे इत्यादि सामान को कर्मचारी पर्यवेक्षक के दिषा–निर्देष अनुसार अपने साथ लेकर खान के अंदर जायेगे।
7. कोई भी कर्मचारी अपने कार्य सम्बंधित सामानों को इधर–उधर अन्यत्र नही रखेंगे या छोड़ेंगे। काम खत्म होने के बाद वे अपने सामान इत्यादि को अपने साथ लेकर उपर आयेंगे।
8. प्रत्येक कर्मचारी अपने कार्यस्थल पर अनुषासन बनाये रखते हुये खान में कोई भी ऐसा कार्य नही करेंगे, जो स्वयं या अन्य किसी को खतरे में डाले।
9. प्रत्येक कर्मचारी अपने कार्यस्थल पर अपने काम के प्रति पूरी निश्ठा,सजगता, अपने अनुभव, अपने 31ववके का परिचय देते हुए एक अच्छे वातावरण का निर्माण करेंगे।
10. प्रत्येक कर्मचारी सुरक्षा नियमों का अनुपालन करेंगे। वे अपनी सुरक्षा के लिए स्वयं की जिम्मेवार होंगे। खान परिसर में कोई भी ऐसा काम में संयुक्त नही होंगे जो उनके सुरक्षा को बाधित करें।
11. प्रत्येक कर्मचारी खान प्रबंधक के द्वारा बनाये गये एसओपी/सीओपी का पूर्णतः पालन करेंगे।
12. प्रत्येक कर्मचारी अपने सुपरवाईजर/पर्यवेक्षक एवं अधिकारियों के निर्देषो का पालन करेंगे तथा खान में अनुषासन बनाये रखेंगे।
13. अनुषासन भंग होने की स्थिति में प्रबंधन कम्पनी के नियमानुसार उस कर्मचारी पर अनुषासनात्मक कार्यवाही करने के लिए स्वतंत्र होगा।

Principal Hazards Identification: Chhal Opencast (SeamIII) Project (6MTY) Mine.

Sl. No.	Description of Hazard	Percentage of workers exposed	Consequences	Probability	Exposure	Total CxPxE
1	Mine Transportation	Maximum	5	5	7	175
2	Contractor Safety Management	Maximum	5	4	8	160
3	Strata Control	High	5	2	7	70
4	Blasting	Medium	5	3	5	75
5	Electricaal Installation	Very low	0.3	7	10	21
6	Inundation	High	5	5	6	150
7	Mine fire/Spontaneous heating	Very low	0.3	7	2.5	5.25
8	Air borne respirable dust and noise	Maximum	0.1	7	10	07
9	Illumination	Maximum	5	3	5	75
10	Unauthorised entry	Medium	0.3	3	5	4.5
11	Inexperienced employee	Medium	5	3	2.5	37.5
12	Inadequate safety appliances	Medium	0.3	7	5	10.5
13	Inadequate resources	Medium	3	5	5	75
14	Indiscipline	Very low	0.3	3	3	2.7
15	Dumping at water logged new extention Patch	Medium	2	2	2	8

Date Wise Details of Works

Risk Assessment:-Harzard Identification(Mining, Electricity & Machinery).

Name of Mine: Chhal Opencast (SeamIII) Project (6MTY).

Name of the Company: M/s South Eastern Coalfields Limited.

Date Conducted 19/08/2020.

Location: Manager Office, CHHAL OC (SeamIII) Project (6MTY).

Assessment Team:			**Facilitators:**	
Name	**Designation**		**Name**	**Designation**
Sri P.P..Karmakar	Colliery Manager-Team Leader		Sri Sanjay Mishra	General Manager, Raigarh Area
Sri S.Maji	Safety Officer		Sri Parimal Mavawala	Area Safety Officer, Raigarh area
Sri L.S.Dangi	Production Incharge		Sri Amit Saxesena	GM(Oprn.) Raigarh Area
Sri Tarit Ku. Das	S.O.E Engineer/ In charge (Excv.)		Sri.M.K.Choudhary	DyGM(M)/SAM, Chhal sub area
Sri. Govind Kumar	Colliery Engr./Dy.Manager(E&M)		Sri B.V.B Reddy	DyGM(M) /S.O.P&P
Sri S.P.Dewangan	Blasting Officer			
Sri Anup Singh	Production Incharge(Coal)			
Sri P.K.Mukherjee	Sr.O/M			
Sri N.Pradhan	W.I (M)/Sr.O/M			
Sri R.K.Viswakarma	Sr.O/M (Health & Higene)			
Sri Ghasi Ram	Sr. O/M (Blasting Overman)			
Sri R.K.Yadav	Workman Inspector(Mechanical)			
Sri S.S.Chandra	Workman Inspector(Electrical)			
Sri Prem Pandey	Supervisor-VCTPL			
Sri Padmun Barman	Dozer Operator			
Sri D.K Verma	Sr. Supervisor M/S DCCCPL & SCCPL			
Sri Asarfi Lal	Mechanical Fitter			

Sri Birendra Jharia	Dozer Operator M/S DCCCPL			
Sri Motilal Singh	Driver-SCCPL			

Abbreviations: HAZ: Hazard; CONS: Consequence; EXPS: Exposure; PROB: Probability.

Hazard Identification (Mining, Electricity & Machinery).

Sl.No	Category	Hazard
1	Blasting	Simultaneous Transportation of explosives and detonator in explosive van.
2	Blasting	Use of Mobile during blasting operation.
3	Blasting	Lightning during blasting operation.
4	Blasting	Lack of knowledge regarding use of explosives.
5	Blasting	Non-use of blasting shelter due to inconvenience in its transportation.
6	Blasting	Misfire of charged holes.
7	Blasting	Presence of persons within danger zone during blasting.
8	Blasting	Pilferage of Explosive and Detonator.
9	Blasting	Fly rock due to overcharging of Blast Holes.
10	Blasting	Fly rock due to Improper Burden and Spacing.

11	Blasting	Non use of approved exploders in blasting
12	Blasting	Use of damaged shot firing cable.
13	Blasting	Fly rock due to Improper stemming.
14	Blasting	Fly rock due to Loose rock present in blasting area.
15	Blasting	Fly rock due to Watery Hole.
16	Blasting	Fly rock due to Secondary Blasting.
17	Blasting	Simultaneous Drilling and charging.
18	Blasting	Not using PPE while handling explosives.
19	Drilling	Skidding of tyre mounted drills
20	Drilling	Drilling in slippery and inclined face
21	Drilling	Drilling near misfire
22	Drilling	Movement of drill machine with raised mast
23	Drilling	No Arrangement of Wet drilling
24	Drilling	Overcrowding near drilling face
25	Strata Control	Presence of geological disturbance
26	Strata Control	Improper benching
27	Strata Control	Overall slope of bench
28	Strata Control	Bench fire
29	Strata Control	Presence of water bearing strata
30	Strata Control	Danger due to operation near Highwall.
31	Strata Control	Danger from overhanging material at face.

32	Strata Control	Weak/ incompetent strata
33	Strata Control	Selection of unsuitable dumpsite
34	Strata Control	Abnormal Dump Geometry
35	Strata Control	Improper sequencing of dumping material
36	Strata Control	Accumulation of water in and around dumping area
37	Strata Control	Improper drainage system
38	Strata Control	Occurance of fire due to dumping of carbonaceous material
39	Strata Control	Dump slide due to sudden heavy rainfall
40	Emergency Response	Ambulance is not fully equipped with life saving fittings.
41	Emergency Response	Shortage of doctors & paramedical staff in backshifts.
42	Emergency Response	Non-availability of ambulance driver in backshifts.
43	Emergency Response	Lack of skill in handling injured persons.
44	Fire	Fire during welding –housekeeping.
45	Haulage and Transportation	Exclusive haul road is not provided in the mine (Plying of other vehicles in Haul road).
45A	Haulage and Transportation(5.4.21)	One way haul road to be provided for discipline transportation.
46	Haulage and Transportation	Passing of vehicle near highwall.
47	Haulage and Transportation	Steep gradient of haul road.
48	Haulage and Transportation	Traffic rule not followed.
48 A	Haulage and Transportation(5.4.21)	Alchol Consumption during driving.

48 B	Haulage and Transportation(5.4.21)	Injury due to flying rocks from overloaded running trucks.
48 C	Haulage and Transportation(5.4.21)	Incompatibility (mismatching) of mining condition to the transporting machines / vehicles plying in the mine /haul road.
49	Haulage and Transportation	Fatigue to dumper operator due to overtime work.
50	Haulage and Transportation	Inadequate berm along haul road.
51	Haulage and Transportation	Inadequate width of haul road.
52	Haulage and Transportation	Sharp bend in haul road.
53	Haulage and Transportation	Inadequate drainage along haul road.
54	Inundation	Inundation from Mand River side
55	Inundation	Inundation from Old working of Dharam Incline
56	Inundation	Inundation due to heavy rainfall from catchment area
57	Mine Fire	Burning of coal in face during winter season.
58	Mine Fire	Spontaneous Heating in Coal Stock.
59	Mine fire	Fire near face
60	Mine working	Unauthorized entry of persons in overburden dump, coal dump and mine premises.
61	Mine working	Consumption of alcohol during working hours.
62	Mine working	Use of mobile by HEMM operators/LMV drivers during work.
63	Mine working	Unauthorized entry of persons in mine roads/premises.
64	Mine working	Work in haste.
65	Mine working	Shortage of Asst. Manager (M)/supervisory staff.

66	Illumination	Inadequate illumination in face, haul road, coal stock yard.
67	Illumination	Improper illumination in drill machine and HEMM.
68	Occupational Health	Dusty Haul road.
69	Occupational Health	Dust at the crossing of travelling road with haul road.
70	Occupational Health	Dust in cabin due to poor gate locking arrangement in HEMM.
71	Occupational Health	Dust generation due to dry drilling.
72	Un-fenced quarry workings	Fall of persons and animals from quarry edge due to inadequate fencing.
73	Crowding of HEMM and other equipments	Simultaneous loading and unloading of coal from the same place in coal dump/stock.
74	Electricity	Shortage of Electrical helpers, electrician.
75	Electricity	Non-provisioning of cradling at several points between haul road and coal stockyard.
76	Electricity	Lack of awareness regarding electrical systems at sub-station.
77	Electricity	Non engagement of skilled persons.
78	Electricity	Unauthorised entry of persons/outsiders in electrical installations.
79	Electricity	Non-periodical testing of electrical equipment’s.
80	Electricity	Improper earthing system at sub-station.
81	Electricity	Non maintenance of single line electrical diagrams and proper documentation.
82	Electricity	Improper identification/description of switches and cable.

83	Electricity	Not following proper shutdown procedure in electrical systems.
84	Electricity	Lack of safety features in switches.
85	Electricity	Proper shutdown procedure not followed during working at overhead line.
86	Electricity	Improper layout of DG Set room.
87	Electricity	Improper maintenance of electrical systems.
88	Electricity	Lightning /Thundering.
89	Electricity	Non use of PPE for electrical works.
90	Electricity	Fall of person from electric poles / overhead lines.
91	Electricity	Inadequate lighting arrangement at substation.
92	Electricity	Uses of unsafe electric welding plant/machine.
93	Electricity	Inadequate fire fighting arrangement in substation.
94	Electricity	Tilted electric pole (3.3KV /220V line overhead line) in mine.
95	Electricity	Inadequate ground 41learance of overhead lines.
96	Electricity	Improper Interlocks.
97	Electricity	Fire in HEMM due to electric short circuiting.
98	Electricity	Use of underrated electrical equipments and cables.
99	Electricity	Improper housekeeping at substation.
100	Electricity	Improper layout of mine substation (equipments and cables).
101	Machinery	Running of dumper without safety features-rear view mirror; Side view mirror, blind spot mirror.

102	Machinery	Running of dumper without safety features (rear view camera, automaticdipper, proximity warning, IMPROPER CANOPY, tail gate protection, fatigue sensing device).
103	Machinery	Proper hoisting arrangement (sling) of HEMM engine is not provided at workshop.
104	Machinery	Surface miner working near highwall side and threat of loose material
105	Machinery	Feeble horn in dumpers.
106	Machinery	Improper parking space for HEMM.
107	Machinery	Poor parking brake in dumpers.
108	Machinery	Skidding of dumpers due to Non-functioning of brakes in front wheels.
109	Machinery	Non-provision of coupling guard of dewatering pump.
110	Machinery	Inadequate size of workshop only shed provided.
111	Machinery	Shortage of mechanical foreman.
112	Machinery	Locking of steering of dumpers.
113	Machinery	Improper locking of raised dump body during maintenance.
114	Machinery	Poor inspection/maintenance (poor visibility of vital parts) of HEMM due to Non-washing.
115	Machinery	Wearing loose garments near moving parts of machinery
116	Machinery	Similar type of nozzle fitting of cylinders.
117	Machinery	Fire in tank of dumper during welding.
118	Machinery	Breakage of boom foot pin ofPC.

119	Machinery	Defunct auto fire extinguisher in HEMM.
120	Machinery	Feeble horn in 2 dozers.
121	Machinery	Bursting of air receiver tank in HEMM.
122	Machinery	Drill-Machine overturns during drilling at toe.
123	Machinery	Improper locking arrangement of gates in dozers.
124	Machinery	Avoiding use of battery cut-off switch while working on engine of HEMM.
125	Machinery	Dust generation during cleaning of Air Cleaner element of HEMM.
126	Machinery	Fire in HEMM due to overheating of turbochargers and oil spray.
127	Machinery	Fire in dumper due to rusting in exhaust pipe.
128	Machinery	Maintenance during running engine.
129	Machinery	Working at drill mast-for repair of broken feed chain.
130	Machinery	Running of dumper with raised dump body.
131	Machinery	Rolling back of Dozers while working.
132	Machinery	Working at drill mast-Hammering of drill rod at height.
133	Machinery	Fall of person from the excavator while working on it.
134	Machinery	Fall of persons from platforms due to damaged railings.
135	Machinery	Un-controlled movement of backhoe boom while engine stops.
136	Machinery	Opening of heated radiator cap of diesel engine.
137	Machinery	Slippery workplace and drill mast ladder due to bursting of hose.

138	Machinery	Non -release of pressurized nitrogen in the suspension cylinder before working on suspension.
139	Machinery	Clearing of big boulders, entangled between dozer blade and engine radiator guard.
140	Machinery	Improper locking of drill mast pin.
141	Dumping at water logged New Extention Patch	Over crowding of Volvo /Tippers
142	Dumping at water logged New Extention Patch	Edge dumping
143	Dumping at water logged New Extention Patch	Dump height within 10 m above water
144	Dumping at water logged New Extention Patch	Improper drain near highwall
145	Dumping at water logged New Extention Patch	Gradient not maintained for drain out dump surface water.
146	Dumping at water logged New Extention Patch	Inadequate lighting
147	Dumping at water logged New Extention Patch	Experience Mining staff not engaged at dump
148	Dumping at water logged New Extention Patch	Speed of dumper more than 5KMPH durig reverse for unloads.
149	Dumping at water logged New Extention Patch	After unloading stoppage of tipper at dump edge
150	Dumping at water logged New Extention Patch	Lack of time to settle the active dump

151	Dumping at water logged New Extention Patch	Improper benching
152(5.4.21)	Contractor Safety Management	Tender document, its compatibility with statue
153(5.4.21)	Contractor Safety Management	Dust suppression
154(5.4.21)	Contractor Safety Management	Working hour
155(5.4.21)	Contractor Safety Management	Age of machine, providing suitable spares and maintenance as required for safe working of machine, retiring the unfit machines and employees from work.
156(5.4.21)	Contractor Safety Management	Statutory obligation and ranking of contractors
157(5.4.21)	Contractor Safety Management	Providing PPEs, training and medical facility to workers
158(5.4.21)	Contractor Safety Management	Encouraging safe workers and work environment

Risk Assessment:-Harzard Identification(Drilling and Blasting and Strata Control).

Name of Mine: Chhal Opencast (SeamIII) Project (6MTY).
Name of the Company: M/s South Eastern Coalfields Limited.
Date Conducted: 19/08/2020.
Location: Manager Office, Chhal Open Cast (SeamIII) Project (6MTY).

Assessment Team:			**Facilitators:**	
Name	**Designation**		**Name**	**Designation**
Sri P.P.Karmakar	Colliery Manager-Team Leader		Sri Sanjay Mishra	General Manager, Raigarh Area
Sri S.Maji	Safety Officer		Sri Parimal Mavawala	Area Safety Officer, Raigarh area

Sri L.S.Dangi	Production Incharge		Sri Amit Saxesena	GM(Oprn.) Raigarh Area
Sri Tarit Ku. Das	S.O.E Engineer/ In charge (Excv.)		Sri.M.K.Choudhary	DyGM(M)/SAM, Chhal sub area
Sri. Govind Kumar	Colliery Engr./Dy.Manager(E&M)		Sri B.V.B Reddy	DyGM(M) /S.O.P&P
Sri S.P.Dewangan	Blasting Officer			
Sri Anup Singh	Production Incharge(Coal)			
Sri P.K.Mukherjee	Sr.O/M			
Sri N.Pradhan	W.I (M)/Sr.O/M			
Sri R.K.Viswakarma	Sr.O/M (Health & Higene)			
Sri Ghasi Ram	Sr. O/M (Blasting Overman)			
Sri R.K.Yadav	Workman Inspector(Mechanical)			
Sri S.S.Chandra	Workman Inspector(Electrical)			
Sri Prem Pandey	Supervisor-VCTPL			
Sri Padmun Barman	Dozer Operator			
Sri D.K Verma	Sr. Supervisor M/S DCCCPL & SCCPL			
Sri Asarfi Lal	Mechanical Fitter			
Sri Birendra Jharia	Dozer Operator M/S DCCCPL			
Sri Motilal Singh	Driver-SCCPL			

Risk Assessment:-Harzard Identification(Haulage/Transportion).

Name of Mine: Chhal Opencast (SeamIII) Project (6MTY).
Name of the Company: M/s South Eastern Coalfields Limited.
Date Conducted: 05./04/2021.
Location: Manager Office, Chhal Open Cast (SeamIII) Project (6MTY).

Risk Ranking(Blasting Operation)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EX PS	PRO B	RISK RATING	
1	2	3	4	5	6	7	8
B-1	Blasting Operation	Use of Mobile during blasting operation.	4	5	3	60	
B-2	Blasting Operation	Lightning during blasting operation.	5	2	5	50	
B-3	Blasting	Lack of knowledge regarding use of	5	5	2	50	

	Operation	explosives.					
B-4	Blasting Operation	Non-provisioning/non-use of blasting shelter.	5	2.5	3	37.5	
B-5	Blasting Operation	Misfire of charged holes.	5	2	3	30	
B-8	Blasting Operation	Presence of persons within danger zone during blasting.	1	2.5	3	7.5	
B-9	Blasting Operation	Pilferage of Explosive and Detonator.	1	5	1	5	
B-10	Blasting Operation	Fly rock due to overcharging of Blast Holes.	0.3	5	3	4.5	
B-11	Blasting Operation	Fly rock due to Improper Burden and Spacing.	0.3	5	3	4.5	
B-12	Blasting Operation	Non use of exploder while blasting.	0.3	2	7	4.2	
B-13	Blasting Operation	Use of damaged shot firing cable.	1	2	2	4	
B-14	Blasting Operation	Fly rock due to Improper stemming.	0.3	5	2	3	
B-15	Blasting Operation	Fly rock due to Loose rock present in blasting area.	0.3	2.5	3	2.25	
B-16	Blasting Operation	Fly rock due to Watery Hole.	0.3	2	3	1.8	
B-17	Blasting Operation	Fly rock due to Secondary Blasting.	0.3	2.5	2	1.5	

B-18	Blasting Operation	Simultaneous Drilling and charging.	0.3	2	2	1.2	

Control Plan as per Risk Ranking (Blasting)

SL.N.	HAZNO.	HAZARD	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments

1	B-1	Blasting Operation	Use of Mobile during blasting operation.	1. Mobile phone shall not be used.	DGC Tech No. 02 dt. 27/01/2005. CMR 2017. Reg.207(2 & 6(a))	1.Issue of office order for prohibition of mobile during blasting operation 2.Implementation of the order strictly during blasting operation 3. SOP shall be prepared 4.SOP shall be implemented 5. Reporting of misconduct and implementation.	Med.	1. Colliery Manager 2.Blasting Officer and Blasting Overman 3.Colliery Manager 4. B.O fficer,Blasting Overman 5.Blasting Overman	1. Issued vide letter no. 2972 Dt.06.08.2020 2. Immediate 3. SOP no. 2402 Dt07.07.2020 4. Immediate 5. Immediate
2	B-2	Blasting Operation	Lightning during blasting operation.	1. Stop all activities immediately.	DGC. 01/1995	1.SOP shall be prepared 2. SOP Shall be implemented. 3.Reporting of bad weather	Med.	1.Colliery Manager 2. B.Officer 3. Blasting Overman	1. SOP no. 2402 Dt.07.07.2020 2. Immediate 3.Immediate
3	B-3	Blasting Operation	Lack of knowledge regarding use of explosives.	1. Knowledge will be update regarding use of explosive.	MVT rule-13, DGC. 09/1997&DGC. 02 dt. 31/01/2003.	1.Arrangement of Spl. training programme 2.Notice of training to concerned persons 3.Release for training 4.Efficient Feedback mechanism	High	1.Area training officer,V.T.O 2. Colliery Manage 3. B.Officer 4. V.T.O	1. Training on 23.03.2020-28.03.2020 2.Immediate 3.Immediate 4.Immediate

4	B-4	Blasting Operation	Non-provisioning/ non-use of blasting shelter.	1. Stop blasting without blasting shelter.	DGC Tech No. 8/1982, Reg. - 196(1)	1. Arrangement of sufficient number of blasting shelters. 2.Proper placement of shelters 3.Ensuring Use of blasting shelters 4. SOP shall be prepared 5. SOP shall be implemented.	High	1.Agent Colliery Manager 2.Blasting Overman Blasting Officer 3.Blasting Overman 4. Colliery Manage 5. Blasting Overman Blasting Officer	1.Provided 2.Immediate 3.Immediate 4. SOP no. 2402 Dt.07.07.2020 5.Immediate
5	B-5	Blasting Operation	Misfire of charged holes.	1. Misfire will be located and demarcated. 2. Ensure fencing of misfire zone.	DGC Tech No. 10/2001, Reg. - 204.	1.Quality of explosive and accessories shall be maintained 2.Charging of holes with adequate quantity of explosives 3.Down the hole charging should be ensured 4.ensuring proper stemming 5.ensuring proper connection	High	1.Blasting Officer Explosive Supplier 2.Blasting Overman 3. Blasting O.M and Blasting Officer 4.Blasting Officer and Blasting O.M 5.Blasting Overman	1. Immediate. 2. Immediate. 3. Immediate. 4. Immediate. 5. Immediate.

6	B-6	Blasting Operation	Fly rock due to Non-uniform Strata.	1. Ensure use of blasting shelter. 2. Evacuation of person from danger zone.	DCG.02/2003 , Reg. - 196	1. SOP shall be prepared. 2. Guard shall be posted to ensure the evacuation of person from danager zone.	Med.	1. Colliery Manager, 2. Blasting Overman, Blasting Officer	1. SOP no. 2402 Dt.07.07.2020 2. Immediate.
7	B-7	Blasting Operation	Simultaneous Transportation of explosives and detonator in explosive van.	1. No simultaneous transportation of explosive and detonators shall be done in explosive van.	DGC.02/1986 , Reg. - 180	1) Explosive van shall run two trips for separate carrying of explosive and detonators. 2. Preparation of SOP for bulk transport of Explosive and Detonators. 3.Arrangement of Explosive van 4.Follow Work Plan	Med	1.Blasting Overman, Blasting Officer 2.Colliery Manager 3.Agent, Colliery Manager 4, Blasting Overman, Blasting Officer	1. Immediate. 2. Sop No. 2379 Dt. 05.07.2020 3. Immediate. 4. Regular Practice.

8	B-8	Blasting Operation	Presence of persons within danger zone during blasting.	1. Stop blasting when person present within denger zone. 2. Gaurd to be posted to remove the person from danger zone. 3. Sufficient warning to be given.	DGC Tech No. 8/1982, Reg. - 196(2.b)	1. SOP shall be prepared and implemented. 2. Sufficient no. of gaurd shall be posted to remove from the danger zone. 3. Warning shall be given by siren, whistel and Red flag.	High	1. Colliery Manager , Blasting officer ,SO 2.Blasting Overman Blasting Officer 3.Blasting Overman	1. SOP no. 2402 Dt.07.07.2020. 2. Immediate. 3.Immediate
9	B-9	Blasting Operation	Pilferage of Explosive and Detonator.	1. Issue only required quantity explosive and detonator. 2. Only Reliable and honest worker engaged in handling of explosive.	DGC Tech No. 03/1992 Reg .No. 207(3)	1. SOP shall be prepared and implemented. 2. Develop a mechanism to select reliable and honest person.Required Police Varification of all people engaged to handle Explosive.	High	1. Colliery Manger, Blasting Officer). SO 2. Colliery Manger, Blasting Officer, Blasting Overman.	1. Sop No. 2379 Dt. 05.07.2020 2. Letter sent to SP Raigarh For Police verification Vide Letter no.2529 dt. 15.07.2020
10	B-10	Blasting Operation	Fly rock due to overcharging of Blast Holes.	1. Stop overcharging of Blast holes.	DCG.02/2003 , Reg No. - 192(8)	1. Blasting shall be done as per provisions laid in the permission.	Med .	1. Blasting Overman	1. Immediate.

11	B-11	Blasting Operation	Fly rock due to Improper Burden and Spacing.	1. Ensure marking of holes before drilling with proper burden and spacing. 2. Drilling of hole will be done under supervision.	DGC.02/2003	1. Marking of holes shall be done by blasting overman with proper burden and spacing. 2. Drilling of holes shall be carried out under constant supervision.	Med.	1. Blasting Overman 2. Blasting Overman , Blasting Officer	1. Immediate 2. Immediate
12	B-12	Blasting Operation	Non-use of exploder while blasting.	1. Ensure use of exploder. 2. No blasting will be done by other means.	DGC.03/1987 , Reg No. 195(1,2)	1. Adequate no. of exploder shall be procured. 2. SOP Will is prepared and no blasting shall be done without exploder. 3.Follow Work plan	Med.	1. SO(MM) 2. Colliery Manager, Blasting Officer. SO 3. Blasting Overman, Blasting Officer.	1. Indent Sent For More Two No.Vide No.445 Dt. 09.03.2020 2. SOP no. 2402 Dt.07.07.2020 3. Immediate.
13	B-13	Blasting Operation	Use of damaged shot firing cable.	1. Ensure non use of damaged shot firing cable.	DGC. 25/1976, Reg No.- 195 (7.b).	1. Daily inspection of short firing cable shall be done and if found damaged it will be replaced.	Med.	1.Blasting Officer , Blasting Overman	1. Immediate
14	B-14	Blasting Operation	Fly rock due to Improper stemming.	1. Ensure proper stemming 2. Ensure evacuation of person and use of blasting	DGC. 02/2003, Reg. no.- 192(13)	1. Moist sand will be used for stemming. 2. Guard will be posted for evacuation person of danager zone.	Med.	1. SO (Civil) 2. Blasting Overman, Blasting Officer	1. Note Sheet no. 2550, Dt. 17.07.2020 Sent 2.Immediate

				shelter.					
15	B-15	Blasting Operation	Fly rock due to Loose rock present in blasting area.	1. Ensure removal of loose rock present in blasting area. 2. Ensure use of blasting shelter.	DCG.02/2003 &DGC. 8/1982, Reg. No. 196(1& 5)	1. Loose rock present in blasting area shall be removed by hand picking before charging of shot holes. 2. No blasting shall be carried out without blasting shelter.	Med.	1.,Overman 2. Blasting Overman, Blasting Officer	1. Immediate 2.Immediate
16	B-16	Blasting Operation	Fly rock due to Watery Hole.	1. Shot holes will be charged only after dewatering of holes. 2. Proper stemming will be done.	DGC Tech No. - 02/2003, Reg no. - 196	1. Dewatering of hole shall be done by suitable bucket. 2. In watery hole Sand shall be used as stemming material.	Low	1. Blasting Overman, Blasting Officer 2. Blasting Officer Overman & Mining sirdar	1. Immediate 2.Immediate
17	B-17	Blasting Operation	Fly rock due to Secondary Blasting.	1. Stop secondary blasting.	DGC. 05/1999 & 02/2003, Reg. No. -196	1.An order related with the subject shall be issued by the manager.	Med.	1. Colliery Manager	1. SOP no. 2402 Dt.07.07.2020

18	B-18	Blasting Operation	Simultaneous Drilling and charging.	1. Stop simultaneous drilling and charging.		1. SOP shall be prepared and implemented.	Med.	1. Colliery Manager, Blasting Officer	1. SOP no. 2402 Dt.07.07.2020

Risk Ranking (Drilling)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
D-1	Drilling	Drilling near misfire	5	2	3	30	
D-2	Drilling	Movement of drill machine with raised mast	0.3	7	10	21	

D-3	Drilling	Skidding of tyre mounted drills	0.3	5	7	10.5	
D-4	Drilling	No Arrangement of Wet drilling	0.1	10	10	10	
D-5	Drilling	Drilling in slippery and inclined face	1	2.5	3	7.5	
D-6	Drilling	Overcrowding near drilling face	1	2.5	3	7.5	

CONTROL PLAN- DRILLING

SL. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments

1	D-1	Drilling	Drilling near misfire shots	1.Avoid drilling near misfire shots	DGC Tech No. - 02/1983, Reg no. - 204	1.Dealing the misfire shots with the help of back hoe shovel and dozer	Med.	1. Blasting Overman	1. Immediate.
2	D-2	Drilling	Movement of drill machine with raised mast	1. Avoid movement of drill machine with raised mast	GSR 985(E), Regulation no. 194	1. SOP for drilling operation 2. Vocational and Refresher Training of drill operators 3.Regular safety talks 4.Follow Work plan	Med.	1. colliery Manager 2 Contractor V.T.O 3,OM (Safety), Blasting Overman. B.O,. Safety Officer 4.Blasting Overman	1. SOP no. 2402 Dt.07.07.2020 2.Immediate 3. Regular. 4. Regular Practice.
3	D-3	Drilling	Skidding of tyre mounted drills	1. Level the drilling site adequately 2. Ensure proper drainage of face if any 3. Persons engaged in operation shall be trained. 4. Provision of crawler mounted drill machine		1) Levelling the face by Dozer and Grader. 2.Drainage by back hoe shovel 3) Vocational and Refresher Training engaged in drilling 4)Regular persuasion with contractor	Med	Blasting Overman Drilling Overman, Blasting Overman. Contractor, Agent,SO(MIN) C.M	1)Immediate 2)Immediate 3)Regular 4)Within 6 months

4	D-4	Drilling	No Arrangement of Wet drilling	1.Avoid drilling without wet drilling arrangement	GSR 985(E), Regulation no. 194	1.In built Wet drilling arrangement in drill machines 2. SOP for drilling operation	Med.	1. Agent, C.M, Contractor & Manufacturer). 2.Manager,Safety Officer	1. within 6 months 2. Immediate
5	D-5	Drilling	Drilling in slippery and inclined face	1.Avoiding drilling in inclined and slippery face 2.Drilling hole after levelling the drill machine	GSR 985(E), Regulation no. 194	1. Levelling of the face by Dozer and back hoe shovel 2.Provision of in built hydraulic jacks for levelling the drill machine	Med.	1.Drilling Overman, Blasting Overman 2.Contractor & Manufacturer	1.Immediate 2. Immediate

6	D-6	Drilling	Overcrowding near drilling face	1. Avoid Over crowding		1.Regular safety talk 2. Preparation & Distribution of SOP for drilling 3.Quality supervision	Med.	1.Overman (Safety) Blasting Overman ,B.O 2.Colliery Manager,S.O 3. M/S, O/M, S/I	1. Regular. 2. SOP no. 2402 Dt.07.07.2020 2.Immediate

Risk Ranking (Strata Control)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
SC-1	Strata Control	Presence of geological disturbance	5	10	2	100	
SC-2	Strata Control	Improper benching	5	10	2	100	
SC-3	Strata Control	Overall slope of bench	5	10	2	100	
SC-4	Strata Control	Abnormal Dump Geometry	5	5	2	50	
SC-5	Strata Control	Improper sequencing of dumping material	5	5	2	50	

SC-6	Strata Control	Danger due to operation near Highwall.	5	3	2	30	
SC-7	Strata Control	Presence of water bearing strata.	5	2	2	20	
SC-8	Strata Control	Accumulation of water in and around dumping area	5	2	2	20	
SC-9	Strata Control	Selection of unsuitable dumpsite.	5	2	2	20	
SC-10	Strata Control	Danger from overhanging material at face.	1	5	3	15	

CONTROL PLAN – STRATA CONTROL

S L. N.	HA Z NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERC I	Res	Comments
1	SC-1	Strata Control	Presence of geological disturbance	1. Identify weak planes and water bearing zones and plan accordingly 2.Continuous supervision by statutory persons	DGC.02/1986 , Reg.106(2)	1.Conduct geotechnical study in consultation with expert of scientific organisation/research organisation and use inputs to devise a mine development 2.i) Formulation of strata control organisation integrated system of supervision ii) Implementation of integrated system of supervision	Med.	1.i) Colliery Manager 2.i) Colliery Manager ii) Shift Overman	1. Engaged IIT BHU Scientist repoort submitted . 2.i) Strata control organisation formed. ii).Regular basis

2	SC-2	Strata Control	Improper benching	1.Strictly adhering to the approved bench design 2.Ensure efficient supervision to restrict proper bench height & width as stipulated in statutes	DGC Tech No. 02 dt. 27/01/2005.	1.(I)Accuracy in survey work (ii)Proper deployment of HEMM 2.i) SOP shall be prepared regarding proper bench height, width and slope. ii) SOP shall be implemented.	Med.	1.i)Sr.Survey or ii) Contractor Shift Overman 2.i) Colliery Manager ii) Contractor Shift Overman	1.i) Immediate ii) Immediate 2.ii) SOP No. 126 Dt.09.01.2020 ii) Immediate
3	SC-3	Strata Control	Overall slope of bench	1.Facilitate determination of optimum pit slope and prescribe the same in mine plan 2.EnsureTraining of persons in geotechnical investigation process and monitoring	DGC. 01/1995	1. Design of ultimate pit slope for new working in consultation and under guidance of experts of research institute and prescribing the same in mine plan. 2(i) Nomination of eligible and competent persons for technical training 2(ii) Release of concerned persons 2(iii)Proper feedback mechanism	Med.	1.MM, AGENT,SO (P&P) 2(i) A.T.O,GM (HRD) 2(ii).SAM,MM 3(iii).ATO,VTO	1. Immediate as per scientific study report 2. Immediate as per schedule

4	SC-4	Strata Control	Abnormal Dump Geometry	1. Ensure maintenance of designed height and slope of the dump	DCG.02/2003 ,	1. Devise a system of monitoring of dumps height and slope as per work plan. 2. Proposal for slope stability radar shall be initiated and after procurement continuous monitoring shall be done as per work plan 3. Till procurement regular supervision by statutory persons.	Med.	1. Colliery Manager P.I, S.I, Surveyor 2 . ASO, GM(RGH) 3.OB incharge, Shift incharge, Shift OM,,MS	1.Immediate. 2. Endorsed in Safety capital Budget for the year 2019-20 & 20-21 vide no.8965 dtd. 14/03/19 & 465 dtd. 09.03.2020 3.Immediate
5	SC-5	Strata Control	Improper sequencing of dumping material	1. Ensure proper sequencing by considering properties of dumping material	DCG.02/2003	1.Constant supervision for ensuring dumping as per properties of dumping material	Med.	1. Shift OM, MS .	1. Immediate
6	SC-6	Strata Control	Danger due to operation near Highwall.	1. Avoid operation near highwall. 2. Work shall be carried out near highwall under constant supervision.	DGC. 07 Dt 05/07/2004, Reg.106	1.Systematic Benching from Top to Downward shall be made 2.SOP shall be prepared and implemented	Med.	1. Quarry incharge, Shift incharge 2. Colliery Manager SI, OM, MS	1. Immediate. 2. Immediate

7	SC-7	Strata Control	Presence of water bearing strata	1. Periodic inspections of mine working by geotechnical engineers, geologist 2. Ensure timely measures to prevent collapse of strata	DGC Tech No. 8/1982,	1A proposal shall be sent to higher management for a inspection team comprising geotechnical engineer and geologist to sudy water bearing strata of mine. 2. A procedure shall be developed as per guidelines of inspection team and shall be implemented to prevent uncontrolled collapse of strata	High	1.Colliery Manager ,Agent 2. Colliery surveyor, WI (Min) , Shift OM, Strata Control Officer ,S.O	1. Scientific study report submitted by IIT BHU scientist. 2. Fortnightly inspected in rainy season , measurement taken monthly throughout the year
8	SC-8	Strata Control	Accumulation of water at the base of the dump	1.Ensure proper drainage system at the base of the dump	DGC.03/1987	1. Construction of garland drains and maintenance thereof at the base of the dump to facilitate drainage of water and keep the base dry.	Med.	1. Colliery surveyor, WI (Min) , Shift OM, Strata Control Officer ,S.O	1. Regularly

9	SC-9	Strata Control	Selection of unsuitable dumpsite	1. Selection of suitable dump site considering dump stability and adequate safe distance from active workings. .	DGC Tech No. 03/1992	1.Framing of SOP regarding Selection of dump site & dump geometry 2.Dump site should be away from water accumulation, active mine working, haul road etc as per statute. 3. Briefing Shift O/M & M/S , Contractor supervisor about related SOP.	High	1. Colliery Manager 2. Colliery Surveyor ,OB I/C, S.I, Shift OM, MS. 3.OM (Safety), SI, Shift OM, Strata Control Officer, S.O	1. SOP No. 8758 Dt.28.02.2019 2. Immediate. . 3. Regular
10	SC-10	Strata Control	Danger from overhanging material at face.	1.Stop working below hanging material. 2. Dressing and removal of hanging material.	DGC. 07 Dt 05/07/2004,	1. Proper dressing of bench corner. 2. Dressing and removal of hanging material shall be carried out under constant supervision by machinery.	Med.	1. Shift Overman 2. Shift Overman, Mining sirdar	1. Regular. 2. Regular.

Risk Ranking(Dumping At New Extension Patch)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
D1	Dumping	Common Dumping.	1	1.5	3	4.5	
D2	Dumping	10 meter from Dump Edge.	2	2	4	16	
D3	Dumping	Height above 10 meter of Water.	1	2	2	4	

D4	Dumping	Drain on Dump side.	1	1	2	2	
D5	Dumping	Gradient.	1	1	1	1	
D6	Dumping	Light	1	1	1	2	
D7	Dumping	Mining Staff	1	1	2	2	
D8	Dumping	Reverse Movement of Vehicle.	2	2	3	12	
D9	Dumping	After Unloading No Stoppage.	1.5	1	2	3	
D10	Dumping	Settling of Dump.	1	1	2	2	
D11	Dumping	Overcrowding at Dump.	2	2	2	8	
D12	Dumping	Top Soil Dumping in Water	3	3	3	27	

CONTROL PLAN – DUMPING

SL. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments

1	D-1	Dumping	Common Dumping.						
2	D-2	Dumping	10 meter from Dump Edge.						
3	D-3	Dumping	Height above 10 meter of Water.						

4	D-4	Dumping	Drain on Dump side.						
5	D-5	Dumping	Gradient.						
6	D-6	Dumping	Light						

7	D-7	Dumping	Mining Staff						
8	D-8	Dumping	Reverse Movement of Vehicle.						
9	D-9	Dumping	After Unloading No Stoppage.						

10	D-10	Dumping	Settling of Dump.						
11	D-11	Dumping	Overcrowding at Dump.						
12	D-12	Dumping	Top Soil Dumping in Water						

Risk Ranking(Emergency response)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
ER-1	Emergency Response	Ambulance is not fully equipped with life saving fittings.	1	2	7	14	
ER-2	Emergency Response	Non-availability of ambulance driver in backshifts.	1	2	3	6	
ER-3	Emergency Response	Lack of skill in handling injured persons.	0.3	2	7	4.2	
ER-4	Emergency Response	Shortage of doctors & paramedical staff in backshifts.	0.3	2	3	1.8	
ER-5	Emergency Response	Breakdown of X-Ray machine since 27/08/2018	2	1	5	10	

CONTROL PLAN – EMERGENCY RESPONSE

SL.No.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Res	Comments
1	ER-1	Emergency Response	Ambulance is not fully equipped with life saving fittings.	1. Provision of ambulance fully equipped with life saving fittings.	Mine Rule- 40 .{2}. (a) & (b)	1. Proposal will be intiated to provide ambulance fully equipped with life saving equipments and fittings.	Med.	1. Agent, project engineer, Area Medical Officer & SO (Excv.)	1. Immediate.
2	ER-2	Emergency Response	Non-availability of ambulance driver in backshifts.	1. Ensure availability of ambulance driver in backshifts .	Mine Rule- 40. {2}. (a) & (b)	1. Sub Area engineer will be directed to provide driver in backshifts.	Med.	1. Agent , project engineer SO (E&M)	1. Immediate.
3	ER-3	Emergency Response	Lack of skill in handling injured persons.	1. Skill of first aider in handling of injured persons to be improved.	Mine Rule - 40.{1}.	1. Training will be imparted to first aider for improvement of skill.	Med	1. Area Medical Officer, Medical officer, Area Training Officer,VTO,	1. Immediate.
4	ER-4	Emergency Response	Shortage of doctors & paramedical staff in backshifts.	1. Provide doctor & Paramedical staff in backshifts.	Mine Rule - 42.{1} , 43. {4}. (a), (b) & (c).	1. Proposal will be intiated to provide doctors & paramedical staff in backshifts.	Low	1. Area GM, APM, Agent & Area Medical Officer.	1 Immediate.

5	ER-5	Emergency Response	Breakdown of X-Ray machine since 27/08/2018	Provision of modern digital X-Ray machine	Mine Rule 29B(b)	Proposal will be initiated to provide modern digital X-Ray machine	Med	1. Area GM, APM, Agent & Area Medical Officer.	1. Immediate.

Risk Ranking (Fire and Mine fire)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
F-1	Fire	Fire during welding –housekeeping.	1	3	3	9	
MF-1	Mine Fire	Spontaneous Heating in Coal Stock.	1	3	3	9	
MF-2	Mine fire	Fire near coal face	0.1	3	3	0.9	
MF-3	Mine Fire	Burning of coal in face during winter season.	0.001	2	2	0.004	

CONTROL PLAN – FIRE AND MINE FIRE

SL. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Res	Comments
1	F-1	Fire	Fire in cotton waste material during welding - housekeeping.	1. Ensure removal of cotton waste material before starting welding. 2. Arrangement of fire- fighting system.	Reg.- 134,139,140	1. Daily cleaning and removal of cotton waste material shall be done before starting welding. 2. Suitable fire extinguisher shall be placed.	Med	1. WorkShop incharge & Welder 2.Foreman, WorkShop incharge	1. Regular 2. Fire extinguisher available.
2	MF-1	Mine Fire	Burning of coal in face during winter season.	1. No burning of coal shall be done without the written permission of Manager.	Reg.- 135(3,4,5)	1. Adherence to strict prohibition and if found disciplinary action shall be taken	High	1. Shift OM, MS	Immediate

3	MF-2	Mine Fire	Spontaneous Heating in Coal Stock.	1. Frequent inspection of coal stock. 2. Provision of fire- fighting arrangement. 3. Timely dispatch of coal.	DGC Tech No. 01/697 Dt. 14/08/ 2008. Reg. -135(5), 137(17),139,140	1. Frequent inspection of coal stock for earily detection of spontaneous heating of coal stock shall be carried out by mining supervisior. 2. S.O.P for fire fighting shall be prepared and implemented. 3. Improvement in existing mechanism for timely dispatch of coal.	Med	1. Overman , Mining sirdar,Loading Supervisor. 2. Manager 3. Colliery Manager, Dispatch officer. 3. Area sales Manager, Dispatch Officer	1.Immediate 2. SOP No. 642 Dt.07.02.2020 3. Immediate
4	MF-3	Mine Fire	Fire near coal face	1. Proper firefighting team with proper fire fighting arrangement 2. Conduct Mock drills for handling of mine fire	Mine Rule - 40.{1}.	1.Formulation of fire fighting team SOP shall be framed SOP shall be implemented 2. Mock rehersal shall be conducted.	Med	1. Colliery Manager , OM,MS 2 Safety Officer, Production in charge.	1. SOP No. 642 Dt.07.02.2020 2. Mock rehersal done on19.02.2020

Risk Ranking(Haulage & Transportation)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
HT-1	Haulage and Transportation	Exclusive haul road is not provided in the mine (Plying of other vehicles in Haul road).	5	5	5	125	
HT-2	Haulage and Transportation	Steep gradient of haul road.	1	10	7	70	
HT-3	Haulage and Transportation	Traffic rule not followed.	1	10	3	30	
HT-3 A	Haulage and Transportation	Injury due to flying rocks from overloaded running trucks.	6	2	3	36	
HT-3 B	Haulage and Transportation	Incompatibility (mismatching) of mining condition to the transporting machines / vehicles plying in the mine /haul road.	4	1	2	8	
HT-4	Haulage and Transportation	Fatigue to dumper operator due to overtime work.	1	10	3	30	
HT-4A	Haulage and Transportation	Alchol Consumption during driving.	5	1	2	10	

HT-5	Haulage and Transportation	Inadequate berm along haul road.	1	10	3	30	
HT-6	Haulage and Transportation	Inadequate width of haul road.	0.3	10	3	9	
HT-7	Haulage and Transportation	Sharp bend in haul road.	0.3	10	3	9	
HT-8	Haulage and Transportation	Inadequate drainage along haul road.	0.3	2	2	1.2	

CONTROL PLAN – Haulage and Transportation

SL. No.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Res	Comments
1	HT-1	Haulage and Transportation	Exclusive haul road is not provided in the mine (Plying of other vehicles in Haul road).	1. Provide separate road for LMV .	DGC Tech No. 6/2010 ,	1. Separate road for LMV will be prepared in the required place.	Low	a), Haul Road I/C,Production Incharge,	a) Provided as per requirement & available space.

2	HT-2	Haulage & Transportation	Steep gradient of haul road.	1. Maintain the gradient of haul road as per statute. 2. Speed of dumper shall not exceed 20 KM per hours.	DGC. 09/2008,Reg.101	1. Gradient shall be minmized by reorientation of haul road. 2. Display of speed limit board and ensure following of traffic rule.	Med	1. Haul road Incharge, Overman (G shift) 2. Safety Officer, OM (Safety)	1. One month 2. Speed limit board displayed at different conspicuous place.
3	HT-3	Haulage & Transportation	Transport rule not followed.	1.Display of Transport rule at conspicuous placeses 2. Implementation of Transport rule.	DGC Tech no. 02/1989,	1. Transport rule shall be displayed at conspicuous place. 2. Awarness among HEMM operator regarding traffic rule by daily safety talk at start of the shift. 3.SOP shall be formulated 4.Implementation of SOP	Med.	1 .Safety Officer. OM(Safety) 2.Safety Officer, OM(Safety) Shift incharge Overman/Mining Sirdar 3. Colliery Manager, 4. SiteIncharge (SCCPL, VCTPL, DCCCPL).	1. Transport rule displayed at conspicuous places. 2. Regular practice 3 SOP No. 2366 Dt.04.07.2020 4 Immediate

3A	HT-3 A	Haulage and Transportation	Alchol Consumption during driving.	1.At the begining of each shift alchol consumption.					
3B	HT-3B	Haulage & Transportation	Injury due to flying rocks from overloaded running trucks.	1.As far as possible trucks shall not be overloaded. 2.Load Indicator to be fitted in all dumpers and tippers	DGC Tech no.2/2015 DGC Tech no.6/2020	1.Contractors shall be informed to take steps to avoid overload. 2. The point to be incorporated in the SOP of excavator operation.	Med	1.Production Incharge, Site In-charge VCTPL, SCCPL 2. Colliery Manager, 3. OM, MS	1.Two months

3C	HT-3C	Haulage & Transportation	Incompatibility (mismatching) of mining condition to the transporting machines / vehicles plying in the mine /haul road.	1.Gradient of the haul road shall be as per statute.	DGC.09/2008,Reg.101	1.Gradient and ramp shall be as per statute. 2.Transporting vehicles and tippers shall be properly maintained and spares shall be replaced timely/ as and when required.	Med.	1. Production In-charge / Manager. 2.SiteIncharge (SCCPL, VCTPL, DCCCPL).	1.3 months. 2.3 months
4	HT-4	Haulage & Transportation	Fatigue to dumper operator due to overtime.	1. Provision of Sufficient dumper operator. 2. Absentism of dumper operator will be controlled.	Mine rule-47 &48.	1. Adequate no, of dumper operators shall be appointed. 2. Close monitoring of leave/ sick of dumper operator 3.Programme for improving attendance should be conducted	Med.	1. SiteIncharge (SCCPL, VCTPL, DCCCPL). 2. SiteIncharge (SCCPL, VCTPL, DCCCPL). 3. SiteIncharge (SCCPL, VCTPL, DCCCPL).	1. Immediate 2. Immediate. 3. Immediate.

5	HT-5	Haulage & Transportation	Inadequate berm along haul road.	1. Ensure adequate berm along haul road	DGC. 09/2008, Reg. 101	1. Berm with adequate hight and width shall be made along haul road. 2. Berms of adequate height and width shall be maintained.	High	1.,Haul road I/C, 2. Shift Overman, Mining sirdar, Contractor Supervisor.	1. Maintained 2. Maintained
6	HT-6	Haulage & Transportation	Inadequate width of haul road.	1. Provide haul road with adequate width.	DGC. 09/2008 ,Reg. 101	1.Widening of the haul rtoad shall be done where necessary	Med.	1. Haul Road.I/c,	1. Maintained
7	HT-7	Haulage & Transportation	Sharp bend in haul road.	1. Ensure 30 meters visibility at all bends. 2. Follow of transport rules.	DGC. 09/2008, Reg. 101.	1. Bend in haul road shall be minimised so as to provide atleast 30 meters visibility to operator. 2. Speed of dumper shall not exceed 05 K.M. Per Hrs. at sharp bend of haul road.	Med.	1. Haul road incharge, 2. . SiteIncharge (SCCPL, VCTPL, DCCCPL).	1. No Sharp bend 2. Immediate.
8	HT-8	Haulage & Transportation	Inadequate drainage along haul road.	1. Ensure adequate drainage along haul road.	DCG. 06 dt. 22/06/2004, Reg.101.	1. One backhoe shall be engaged for drainage maintenance along haul road as and when required.	High	1.,Haul Road I/c,	1. As & when required engaged

Risk Ranking (Inundation)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
I-1	Inundation	Inundation from Mand River side	5	0.5	1	2.5	
I-2	Inundation	Inundation due to heavy rainfall from catchment area	5	2	2	20	
I-3	Inundation	Inundation from waterlogged workings of quarry no 1	3	2	2	12	
I-4	Inundation	Drowning of pumps	2	1	2	4	
I-5	Inundation	Danger to the work persons engaged in pumping operation.	2	1	1	2	
I-6	Inundation	Failure of pump	5	2	2	20	
I-7	Inundation	Power failure/Electrical break down.	4	2	2	16	

CONTROL PLAN – Inundation

SL. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Res	Comments
1	I-1	Inundation	Inundation from mand river side	Monitoring and inspection of existing embankments thoroughly	DGC Tech No. 6/2010, Reg. no.149	1.Regular inspection of embankment and river water level by statutory persons and special attention during monsoon and heavy rainfall : 2.Establishment of control room during monsoon. 3.Organisation for control room 4.Formation of emergency response plan	Low	1) Surveyor, SO. 2) Colliery Manager, SO 3) Colliery Manager, SO 4) Colliery Manager, SO	1) Immediate 2.Control room established vide letter no 2123 Dt. 16.06.2020 3. Control room established vide letter no 2123 Dt. 16.06.2020 4. E.R.P Formed Vide No. 1966 Dt.24.05.2020

						5.Conducting mock rehearsals(Date & time shall be planned by Agent)		5. Safety Officer, Production in charge.	5. Mock rehersal done on 08.06.2020
2	I-2	Inundation	Inundation Due to heavy rain from catchment area	Proper inspection of vulnerable points along the catchment area.	, DGC. 01 dt.18/01/2001 & DGC.06/2004,	1. Inspection of garland drain by sr.officials during heavy rainfall for any blockage. 2. Inspection of sump water level and condition of pumping station. 3.Ensuring continuous Power supply for pumping station	High	1. SO, Sr.O/M 2. Colliery Engineer (E&M) 3. Colliery Engineer (E&M) Foreman I/C (E&M)	1.Regular 2. Regular 3. Regular
3	I-3	Inundation	Inundations from waterlogged workings of quarry no 1.	1. No working within 60 m of water logged workings of quarry no 1.	Reg.150 CMR2017	1. Check survey at rgular intervals, 2. Advance dewatering of waterlogged working of quarry no 1. 3. Additional Pumping arrangement shall be kept ready.	High	1.Colliery Surveyor, Area survey officer 2. Colliery Engineer (E&M) 3. Colliery Engineer (E&M) .	1 Regular 2. Immediate , 04 Pumps of 1000 GPM each Installed. 3. Out of 04 Pumps 02 pumps are standby .

5	I-5	Inundation	Drowning of pumps	1.Pumps shall be kept at the safe distance, away from the sump 2.Contineous Power supply for the pump shall ensured	Reg.150 CMR2017	1. Inspection of sump water level and condition of pumping station. 2. Laying a additional delivery line. 3. Approach road up to pump to be maintained	High	1. Colliery Engineer (E&M) 2. . Colliery Engineer (E&M) 3. Production Incharge	1. Regular 2. Maintained 3. Maintained
10	I-6	Inundation	Failure of pump	1. Stand by pumps to be provided. 2. Pumping capacity to be increased. 3. Proper maintenance of pumps.	Stand by pump to be installed	1. Spare of pumps should readily available in store. 2. Regular maintenance of pumps.	Medium	Colliery Engineer (E&M)	Regular
11.	I-7	Inundation	Power failure/Electrical break down.	1. Alternate source of power/Diesal operated pumps should kept ready. 2. Over line maintenance, Tree branch cutting before monsoon.	Alternate source of electricity	1. Proper maintenance of electrical motor and swich gear. 2. Electrical spare parts readly available. 3. Maintain close liaisoning with CSEB department.	Medium	Foreman Incharge (Elec.) 2.Colliery Engineer (E&M) 3. Sub Area Engineer,	1.Regular 2. Immediate 3. Immediate

Risk Ranking(Mine working& Illumination)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
MW-1	Mine Working	Use of mobile by HEMM operators/LMV drivers during work.	5	5	3	75	
MW-2	Mine Working	Work in haste.	1	5	7	35	
MW-3	Mine Working	Consumption of alcohol during working hours.	1	5	3	15	
MW-4	Mine Working	Shortage of Asst. Manager (M).	1	2	7	14	
MW-5	Mine Working	Unauthorized entry of persons in overburden dump, coal dump and mine premises.	0.3	3	3	2.7	
MW-6	Mine Working(5.4.21)	Mine development, Pit geometry, gradient steeper than 1 in 16, ramps >1 in 16 and $< 1\ in\ 10$	8	5	1.2	48	
MW-7	Mine Working(5.4.21)	Inadequate width of bench, more height of bench than digging height of machine	4	3	1	12	
ILL-1	Illumination	Inadequate illumination in face, haul road, OB Dump & coal stock yard.	1	5	7	35	

ILL-2	Illumination	Improper illumination in drill machine and HEMM.	1	5	7	35	

CONTROL PLAN – Mine working and illumination

S L. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Res	Comments

1	MW -1	Mine Working	Use of mobile by HEMM operators/LMV drivers during work.	1. Mobile phone shall not be used during work.	DGC Tech No. 02 dt. 27/01/2005.	1.Issue of office order for prohibition of Use of mobile during operation 2.Implementation of the order strictly during operation of HEMM 3. Display of boards for prohibiting use of mobiles phones at work site shall be done. 4. Reporting of misconduct and implemented.	Med.	1.Colliery Manager 2. Overman ,MS 3 Safety officer 4.Shift OM, MS	1. Office Order issued vide no. 2972 dt.06.08.2020 2.Immediate 3. Displayed at the entrance of mines 4. Regular
2	MW -2	Mine Working	Work in haste.	1. Awareness among worker about not to work in haste.		1. Saftey talks to spread awareness among worker not to work in haste.	High	1.Shift Incharge) , Overman , Mining Sirdar, Foreman and person concerned.	1. Regular
3	MW -3	Mine Working	Consumption of alcohol during working hours.	1. Identification of persons consuming alcohol at the time of attendance and during working hours.	Mine Rule - 81(2) ,	1.. Provision of alcohol tester at MTK room shall be done and test shall be conducted for alleged/suspected person by competent person. 2.Not allowing such persons to enter in the mine	High	1.Security Incharge, Shift Incharge. 2. Security Incharge, Shift Incharge.	1. Immediate. 2.Immediate.

4	MW -4	Mine Working	Shortage of Asst. Manager (M).	1. Provide sufficient no. of Asst. Manager.	Reg.30 CMR-2017	1. Initiate Proposal to provide adequate no's of Asst. Manager.	Med.	1.Agent , Area G.M	1.Status of Statutory person shortage /Surplus send vide no. 1492 Dt.08.10.2019, 1694 Dt. 01.05.2020 2968 Dt.06.08.2020
5	MW -5	Mine Working	1.Unauthorized entry of persons in overburden dump, coal dump and mine premises.	1.Fencing around the periphery of the mine 2. Provision of security guard with patrolling team. 3.Checking of vehicles for any unauthorised persons specially in roadsale trucks	DGC Tech No. 03 Dt. 22/04 /2014 & reg.61,128 CMR2017	1. Proposal already sent for fencing around periphery of mine. 2. Security guard will be posted at entry points and shall be provided with vehicle for patrolling and security. 3. Checking of vehicles at mine entry gate by the security personnel and shall ensure no un authorised person's entry.	Low	1.GM (RGH),SO (Min), SO(Civil) 2. Area Security officer, APM. 3.SecurityIncharge guards	1.Proposal for fencing sent vide no. 4407 Dt. 22.08.2019. Garland drain prepared all along the edge of quarry. 2. Immediate 3. Stopped entry all unauthorized person.

6	MW -6	Mine Working	Mine development, Pit geometry, gradient steeper than 1 in 16, ramps $>$1 in 16 and $< 1\ in\ 10$						
7	MW -6	Mine Working							

6	ILL-1	Illumination	Inadequate illumination in face, haul road,OB Dump & coal stock yard.	1. Illumination survey at regular intervals. 2. Provide adequate lighting arrangement in face, Haulroad,OB dump and coal stock yard as per statute.	DGC Tech No. 06 of 2016.	1. Illumination survey shall be conducted at monthly basis. 2. Sufficient no. of light fixture will be installed.	Med.	1.Manager,PE 2. Agent,P.E. (E&M),SO(E &M	1. Immediate & thereafter monthly. 2. One Month.
7	ILL-2	Illumination	Improper illumination in drill machine and HEMM.	1.Provide adequate illumination in drill machine and HEMM 2. Conduct lighting survey of machine.	,DGC Tech No. 06 of 2016. .	1. Sufficient no. of light fixture will be installed. 2. Lighting survey shall be conducted monthly.	High	1. P.E.(X.),Fore man (x). 2 . P.E.(X.) , Fore man Incharge(x).	1. One Week. 2. Immediate.

Risk Ranking(Occupational Health, Unfenced Quarry working & Crowding of HEMM)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
OH-1	Occupational Health	Dusty Haul road.	5	5	5	125	
CH-1	Crowding of HEMM and other equipments	Simultaneous loading and unloading of coal from the same place in coal dump/stock.	1	5	7	35	
UF-1	un-fenced quarry workings	Fall of persons and animals from quarry edge due to inadequate fencing.	0.3	5	7	10.5	
OH-2	Occupational Health	Dust in cabin due to poor gate locking arrangement in HEMM.	0.1	10	7	7	
OH-3	Occupational Health	Dust generation due to dry drilling.	0.1	5	7	3.5	

CONTROL PLAN – Occupational Health, Unfenced quarry working, Crowding of HEMM and other vehicles

SL. N.	HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Responsibility	Comments
1	OH-1	Occupational Health	Dusty haul road.	1. Ensure sufficient water spraying on haul road. 2. Ensuring the availablity of standby Water Tanker.	DGC Tech No. 05/1987, Reg. -143. CMR-2017	1.28KL Water tanker shall be used for water spray on haul road. 2. The breakdowns of water tanker will be attended immediately by keeping adequate spares. 3.Proposal sent for stand by water tanker 4.Timely sending proposal for water tanker	High	1. Shift incharge, Overman. 2. P.E.(X,SO(X SO(MM,Reg.Store Manager(MM). 3.P.E.(X),SO(X), GM(RGH) 4 PE(X)	1. Immediate. **(YF)** 2.Immediate. **(YF)**

2	CH-1	Crowding of HEMM and other vehicles	Simultaneous loading and unloading of coal from the same place in coal dump.	1. Avoid Simultaneous loading and unloading of coal from the same place in coal dump. 2. Provide and allocate separate place for loading and unloading in coal stock. 3. Provision of parking yard.		1. SOP shall be prepared and implemented. 2. Use one stock for loading and another stock for unloading. 3. Parking yard shall be established near coal dump.	Med.	1. Manager, Dispatch Officer. 2. Dispatch Officer, Supervisor, and loading incharge. 3. Dispatch Officer, Supervisor SECURITY Incharge,.	1. One week. 2. Immediate. **(YF)** 3. Immediate.
3	UF-1	Unfenced quarry workings	Fall of persons and animals from quarry edge due to inadequate fencing.	1. Provision of adequate fencing to prevent fall of person and animals from quarry edge.	DGC. 07 Dt 05/07/2004, Regulation 128 of CMR 2017.	1. Adequate fencing shall be provided.	Med.	1.Agent , P.E. (Civil) , S.O. (Civil)	1. Six month.

4	OH-2	Occupational Health	Dust in cabin due to poor gate locking arrangement in HEMM.	1. Ensure proper gate locking arrangement in HEMM. 2. Provide PPE to worker.	DGC. 01/2010 ,	1. Defective locking arrangement of the cabin gate shall be rectified. 2. Sufficient stocks shall be maintained and Workers shall be provided with PPE at regular intervals/as and when required.	High	1. P.E.(X.) , Workshop Incharge. 2. Manager & SO (MM), ASO.	1. Immediate. 2. Two week.
5	OH-3	Occupational Health	Dust generation due to dry drilling.	1. Conduct Dust survey at regular interval 2. Ensure wet drilling. 3. Provide PPE to worker engaged drilling operation.	, DGC. 01/2010 ,	1. Dust Survey shall be conducted as per statute. 2. Daily inspection of wet drilling arrangement of drill machine shall be carried out and report convey to all concerned. 3. Sufficient stocks shall be maintained and Workers shall be provided with PPE at regular interval.	Med.	1 Safety Officer, Overman. 2. Engineer (X.), Fitter , Drill Operatosr. 3. Manager, SO (MM) ASO.	1. Immediate. 2. Immediate. 3. Immediate.

Risk Assessment – Electricity

Name of Mine: Chhal Opencast (SeamIII) Project (6MTY).
Name of the Company: M/s South Eastern Coalfields Limited.
Date Conducted: 01/09/2019.

Location: Manager Office, Chhal Open Cast (SeamIII) Project (6MTY).

As per Risk Ranking(Electricity)

Assessment Team:		**Facilitators:**		
Name	**Designation**	**Name**	**Designation**	
Sri. R B Verma	Colliery Manager-Team Leader	Sri J.G.Sing	GM Ralgarh	
Sri O.P.Tiwari	PE (E&M.)	Sri Parimal Mavawala	Area Safety Officer, Raigarh Area	
Shri S.Maji	Safety Officer	Sri R.K.Raju	GM(Opr)Raigarh Area	
Sri Anoop Singh	Production Incharge	Sri S. Malakar	SO(Excv) Raigarh	
Sri R.P.Sahu	Workman Inspector (Mining)	Sri.D.K.Singh	SO(E&M)	
Sri S.S.Chandra	Workman Inspector (Elect.)	Sri. B.V.B.Reddy	Dy.GM/SAM	
Sri Pradeep Kumar Singh	Electrical Supervisor			
Sri D .D Chandra	Electrician			
Sri Jai Prakash Sahu	Electrical Helper			
Sri P. T Ekka	Sub Station Attendant			
Sri K.G.V.Gautam	Colliery Engineer (E&M.)			

HAZ NO	**HAZARD**	**MECHANISMS**	**CALCULATED RISKS**				**Comments**
			CONS	**EXPS**	**PROB**	**RISK RATING**	

1	2	3	4	5	6	7	8
E-1	Electricity	Improper earthing system at sub-station.	5	5	5	125	
E-2	Electricity	Improper identification/description of switches and cable.	5	10	3	150	
E-3	Electricity	Not following proper shutdown procedure in electrical systems.	5	2.5	7	87.5	
E-4	Electricity	Lack of safety features in switches.	5	2.5	7	87.5	
E-5	Electricity	Proper shutdown procedure not followed during working at overhead line.	5	2.5	7	87.5	
E-6	Electricity	Improper maintenance of electrical systems.	1	10	7	70	
E-7	Electricity	Lightning /Thundering.	5	2.5	3	37.5	
E-8	Electricity	Shortage of electricians and helpers.	1	5	3	15	
E-9	Electricity	Non-periodical testing of electrical equipment's.	0.3	5	7	10.5	
E-10	Electricity	Inadequate lighting arrangement at substation	0.1	10	10	10	
E-11	Electricity	Uses of unsafe electric welding plant/machine.	1	5	2	10	
E-12	Electricity	Non-provisioning of cradling at several points between haul road and coal stockyard.	0.3	10	3	9	
E-13	Electricity	Lack of awareness regarding electrical systems at sub-station.	0.3	10	3	9	
E-14	Electricity	Non engagement of skilled persons.	0.3	10	3	9	
E-15	Electricity	Non maintenance of single line electrical diagrams and proper documentation.	0.3	10	3	9	
E-16	Electricity	Inadequate fire fighting arrangement in substation.	0.3	10	3	9	

E-17	Electricity	Fall of person from electric poles / overhead lines.	1	3	3	9	
E-18	Electricity	Tilted electric pole (11 KV line overhead lines) in mine.	1	2	3	6	
E-19	Electricity	Inadequate ground clearance of overhead lines.	1	2	3	6	
E-20	Electricity	Improper Interlocks.	0.3	5	3	4.5	
E-21	Electricity	Non use of PPE for electrical works.	0.3	5	3	4.5	
E-22	Electricity	Improper layout of DG Set room.	0.3	3	3	2.7	
E-23	Electricity	Unauthorised entry of persons/outsiders in electrical installations.	0.3	3	2	1.8	
E-24	Electricity	Fire in HEMM due to electric short circuiting..	0.3	2	2	1.2	
E-25	Electricity	Use of underrated electrical equipments and cables.	0.1	2	3	0.6	
E-26	Electricity	Improper housekeeping at substation.	0.1	2.5	2	0.5	
E-27	Electricity	Improper layout of mine substation (equipments and cables).	0.01	10	3	0.3	

Control Plan as per Risk Ranking(Electricity)

HAZ. N.	Hazard	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments
E-1	Electricity	Improper earthing system at sub-station.	1. Ensure proper earthing system at sub-station.	CEA-2010 Reg. 99	1a)Renovation&maintenence of existing earthing system. b) Changeover to new technology from conventional earthing system. c) Periodical testing of earthing system shall be carried out.	Med	1.a)PE(E&M)SO(E&M)& Electrical Supervisor b)PE(E&M)& SO(E&M). c)PE(E&M)& Electrical supervisor.	1a) Three months. **(YF)** b) six months. c) Immediate. **(YF)**
E-2	Electricity	Improper identification/description of switches and cable.	1. Ensure identification/description of switches and cable from both sides.	CEA-2010 Reg. 19 (6)	1. Painting & face writing will be done on every switch & cables.	Med	1.)PE(E&M), Electrical sup. .	1) Immediate**.** **(YF)**
E-3	Electricity	Not following proper shutdown procedure in electrical systems.	1. Ensure proper shutdown procedure in electrical systems.	CEA-2010 , (IS : 3216-1969)	1. SOP to be prepared for proper shutdown procedure in electrical systems.	Low	1. PE (E&M), Electrical sup. .	1) one week. **(YF)**
E-4	Electricity	Lack of safety features in switches.	1. Without safety features switches shall not be used.	CEA-2010 Reg. 45(2)	1. Frequent checking & testing of safety features of switches.	Med	1. PE (E&M), Electrical sup..	1) Immediate. **(YF)**

E-5	Electricity	Proper shutdown procedure not followed during working at overhead line.	1. Ensure follow up proper shutdown procedure during working at overhead line.	CEA-2010 , (IS : 3216-1969)	1.a) SOP to be prepared for proper shutdown procedure during working at overhead line. b) Written line clear process will be followed & record of each shutdown shall be maintained.	Low	1a) PE (E&M), Electrical sup. . b) PE (E&M), Electrical sup. .	1a) one week. **(YF)** b) Immediate. **(YF)**
E-6	Electricity	Improper maintenance of electrical systems.	1. Ensure proper maintenance of electrical systems.	CEA-2010 Reg. 12	1. Periodical maintenance of electrical systems shall be done.	Med	1. PE (E&M), Electrical sup. .	1. Immediate. **(YF)**
E-7	Electricity	Lightning /Thundering.	1. Lightning Arrester and lightning mast shall be provided.	CEA-2010 Reg. 74	1a) Installation of lightning Arrester and lightning mast b) Separate & insulated leads shall be maintained to discharge the electrical surges.	Med	1a) PE(E&M), SO(E&M). b) . PE(E&M), electrical sup. .	1.a) Two months. b) Two months.
E-8	Electricity	Shortage of electricians and electrical helpers.	1. Appointment of electricians and helpers.	CEA-2010 Reg.03, 94 & 115.	1.a) Recruitment of electricians and helpers 1. b) transfer of electrician from other mine.	Low	1. a)APM,GM(RGH) b) GM area, APM, SO (E&M). .	1. a) Three months. **(YF)** b) one week. **(YF)**

E-9	Electricity	Non-periodical testing of electrical equipment's.	1. Ensure periodical testing of electrical equipments& keep its records.	, CEA-2010 Reg. 110 (9) &115 (5).	1. Intiate a proposal for getting work done through authorised agency.	Med	1. P.E.(E&M),SO(E&M) & Agent .	1. Three months. **(YF)**
E-10	Electricity	Inadequate lighting arrangement at substation.	1. Provide adequate lighting arrangements at substation.	DGC.06/2016	1. Sufficient no. of light will be installed.	Med	1. PE(E&M) , Electrical Supervisor .	1.Immediate .
E-11	Electricity	uses of unsafe electric welding plant/machine	1. Ensure unsafe electric welding plant/machine shall not be used.	DGC. 12 Dt. 26/09/2002	1a). Daily inspection of electric welding plant/machine shall be done before use. b) SOP shall be prepared.	Med	1.a) PE(E&M), Electrical Sup. , Welder. b) PE(E&M), Electrical Sup. .	1a)Immediate b) one week.
E-12	Electricity	Non-provisioning of cradling at several points between haul road and coal stockyard.	1. Provision of cradling l along the overhead line where ever necessary.	, CEA-2010 Reg.73	1. Cradling will be provided. 2. Regular inspection for overhead lines by electrical supervisors	Low	1. PE (E&M). SO(E&M)Electrical supervisor - Foreman I/C	1. one week. **(YF)**
E-13	Electricity	Lack of awareness regarding electrical systems at sub-station.	1. Daily safety talk and training of workers engaged for electrical works.	VT Rule-13.	1. a)Daily safety talk will be delivered. b) Special training in electrical works will be arranged at VTC.	Med	1. a) PE(E&M), Foreman I/C. b) Manager, Area training Officer (),	1. a) Immediate. **(YF)** b) one month. **(YF)**

							VTO.	
E-14	Electricity	Non engagement of skilled persons.	1. Engagement of only skilled persons in electrical works.	VT Rule-13.	1. Devise a mechanism for engaging only VTC trained persons especially for electrical works.	Low	1. Manager, PE(E&M).	1. Immediate. **(YF)**
E-15	Electricity	Non maintenance of single line electrical diagrams and proper documentation.	1. Ensure correct & up-to-date single line diagram displayed at substation and other conspicuous places. 2. Ensure proper maintenance of proper documentation.	CEA-2010 Reg. 96 (1)	1. Correct & up-to-date single line diagram shall be maintained and displayed. 2. Proper documentation shall be done.	Med	1. PE(E&M), Electrical sup. . 2. PE (E&M), Electrical sup. .	1. Immediate. **(YF)** 2. Immediate. **(YF)**
E-16	Electricity	Inadequate fire fighting arrangement in substation.	1. Ensure adequate fire fighting arrangement in substation.	CEA-2010 Reg.97.(3)	1. Provide adequate fire fighting arrangements at substation.	Med	1. PE(E&M), Electrical Sup. , Fire fightingIncharge.	1. Immediate.
E-17	Electricity	Fall of person from electric poles / overhead lines.	1 Ensure use of safety belt and suitable ladders.	CEA-2010 Reg. 74	1. Required no. of safety belt and ladders shall be made available.	Med	1. PE (E&M), Electrical supervisor.	1. Immediate. **(YF)**
E-18	Electricity	Tilted electric pole (3.3 KV line overhead line) in mine.	1. Ensure proper erection of electric pole (3.3 KV line overhead line) .	CEA-2010 ,Reg.55-57,	1. Proper installation of tilted electric pole shall be done.	Med	1. PE (E&M), SO(E&M).	1. Two months.

E-19	Electricity	Inadequate ground clerance of overhead lines.	1 Ensure adequate ground clerance of overhead lines.	CEA-2010 ,Reg.58 & 97.(4)	1a) proper clearance shall be provided. b) Awareness should be spread among Dumper operators.	High	1a) PE (E&M), electrical sup. b) Shift Incharge, Overman.	1a)Immediate b)Immediate
E-20	Electricity	Improper Interlocks.	1. Ensure proper interlock.	CEA-2010 ,Reg.45	1a). Periodical checking of Interlocks b) SOP shall be made for the same.	Med	1a) PE (E&M), Electrical sup. . b) PE (E&M), Electrical sup..	1a) Immediate. **(YF)** b) one week.
E-21	Electricity	Non use of PPE for electrical works.	1. Ensure use of PPE for electrical works.	CMR-Reg. 244 CMR-2017	1a) Required no. of PPE shall be made available. b) Proper records of issue/receive of PPE shall be maintained.	High	1a) Manager, PE(E&M), Safety Officer . b) Safety Officer .	1.a) Immediate. b) Immediate.
E-22	Electricity	Improper layout of DG Set room.	1. Proper layout of DG set room shall be maintained.		1. Bus bar shall be properly enclosed and insulated .	Med	1. PE(E&M).	1. fifteen days. (YF)

E-23	Electricity	Unauthorised entry of persons/outsiders in electrical installations.	1. Construction of boundary walls and fencing to restrict entry of unauthorised persons/outsiders. 2. Display of caution boards at electrical installations prohibiting un authorised entry. 3. Posting of security guard.		1. Process & construction of boundary walls. 2. Inspection of fencing, caution boards at regular intervals. 3. Sercurity guards shall be posted .	Med	1.P.E.(civil),Agent , S.O.(civil), G.M. area . 2.PE(E&M),Foreman I/C 3.. security I/C, Manager, PE(E &M).	1.One year. 2. Three months. **(YF)**
E-24	Electricity	Fire in HEMM due to electric short circuiting.	1. Provision of automatic fire fighting system. 2. Periodical inspection of electrical wiring system of HEMM.	DGC Tech No. 01/697, Dt. 14/08/ 2008 & DGC. 10/2004	1. Automatic fire fighting system will be installed on HEMM. 2. Periodical Inspection of electrical wiring system shall be exercised.	Med	1. PE (X.) &SO(X.) 2. PE(X.) , workshop incharge&supervisior .	1. Three Months 2. Immediate.
E-25	Electricity	Use of under-rated electrical equipments and cables.	1. Ensure non uses of under-rated electrical equipments and cables.	CEA-2010 Reg.12	1. Provide electrical equipments and cables of adequate capacity.	Med	1. PE(E&M), SO(E&M).	1. one month
E-26	Electricity	Improper housekeeping at substation.	1. Ensure proper housekeeping at substation.		1. Daily Inspection of substation.	High	1. Electrical supervisor..	1. Immediate.

E-27	Electricity	Improper layout of mine substation (equipments and cables).	1. Ensure proper layout of mine substation (equipments and cables).	CEA-2010 Reg.12&13.	1. Shed for the substation shall be renovated and additional platform shall be provided.	Med	1. Agent , PE(Civil), PE(E&M).	1. one month. **(YF)**

Hazard Identification (Machinery).

Sl.No	Category	Hazard
1	Machinery	Running of dumper without safety features-rear view mirror; Side view mirror, blind spot mirror.
2	Machinery	Running of dumper without safety features (rear view camera, automaticdipper, proximity warning, IMPROPER CANOPY, tail gate protection, fatigue sensing device).
3	Machinery	Proper hoisting arrangement (sling) of HEMM engine is not provided at workshop.
4	Machinery	Feeble horn in dumpers.
5	Machinery	Improper parking space for HEMM.
6	Machinery	Poor parking brake in dumpers.
7	Machinery	Skidding of dumpers due to Non-functioning of brakes in front wheels.
8	Machinery	Non-provision of coupling guard of dewatering pump.
9	Machinery	Non availability of workshop only shed provided.
10	Machinery	Shortage of mechanical foreman.
11	Machinery	Locking of steering of dumpers.
12	Machinery	Improper locking of raised dump body during maintenance.
13	Machinery	Poor inspection/maintenance (poor visibility of vital parts) of HEMM due to Non-washing.
14	Machinery	Wearing loose garments near moving parts of machinery

15	Machinery	Improper positioning of switch and pump at HEMM washing station.
16	Machinery	Similar type of nozzle fitting of cylinders of Oxygen and Nitrogen.
17	Machinery	Fire in tank of dumper during welding .
18	Machinery	Breakage of boom of PC.
19	Machinery	Defunct auto fire extinguisher in HEMM.
20	Machinery	Feeble horn in all 4 dozers.
21	Machinery	Bursting of air receiver tank in HEMM.
22	Machinery	Drill-Machine overturns during drilling at toe.
23	Machinery	Improper locking arrangement of gates in dozers.
24	Machinery	Avoiding use of battery cut-off switch while working on engine of HEMM.
25	Machinery	Dust generation during cleaning of Air Cleaner element of HEMM.
26	Machinery	Fire in HEMM due to overheating of turbochargers and oil spray.
27	Machinery	Fire in dumper due to rusting in exhaust pipe.
28	Machinery	Maintenance during running engine.
29	Machinery	Working at drill mast-for repair of broken feed chain.
30	Machinery	Running of dumper with raised dump body.
31	Machinery	Rolling back of Dozers while working.
32	Machinery	Working at drill mast-Hammering of drill rod at height.
33	Machinery	Fall of person from the excavator while working on it.
34	Machinery	Fall of persons from platforms due to damaged railings.
35	Machinery	Uncontrolled movement of backhoe boom while engine stops.

36	Machinery	Opening of heated radiator cap of diesel engine.
37	Machinery	Clearing of big boulders, entangled between dozer blade and engine radiator guard.
38	Machinery	Improper locking of drill mast pin.

Risk Assessment – Machinery.

Name of Mine: Chhal Open Cast(SeamIII)Project(6MTY).
Name of the Company: M/s - SOUTH EASTERN COAL FIELDS LIMITED.
Date Conducted: 01/09/2019.
Location: Manager Office, Chhal OCM.

Assessment Team:		**Facilitators:**	
Name	**Designation**	**Name**	**Designation**
Sri.R B Verma	Mnager		
Sri S.Maji	Safety Officer	Sri J.G.Sing	GM Raigarh Area
Sri Anoop Singh	production Incharge	Sri.Parimal Mavawala	ASO Raigarh Area
Sri R.P.Sahu	Workmen Inspector (Mining)	Sri. R.K.Raju	GM(Opr.)/Raigarh Area
Sri K Prasad	Mining Sirdar	Sri S. Malakar	SO(Excv)
Sh.T.K.Das	Project Engineer (Excav.)	Sri D. K. Singh	SO(E&M
Sh.O.P.Tewari	Project Engineer(E&M)	Sri. B.V.B.Reddy	Dy.GM/SAM
Sh.S .S. Chandra	Workmen Inspector (Electrical)		
Sh.M Toppo	Mechanical Fitter		
Sri. Motichand Patel	Pump Operator		

Sri.Mahabir Jat	Mechanical Foreman		
Sri G Sharma	Workmen Inspector (Mechanical)		

Risk review was done on 05.04.2021 and past PSC.Point no. 31A was added considering the recommendations of accidents in the mine.

Abbreviations: HAZ: Hazard; CONS: Consequence; EXPS: Exposure; PROB: Probability.

As per Risk Ranking(Machinery)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8
MAC-1	Machinery	Running of dumper without safety features-rear view mirror; Side view mirror, blind spot mirror.	3	5	4	60	
MAC-2	Machinery	Running of dumper without safety features (rear view camera, automaticdipper, proximity warning, tail gate protection, fatigue sensing device).	3	6	4	72	
MAC-3	Machinery	Feeble horn in dumpers.	1	6	7	42	
MAC-4	Machinery	Poor parking brake in dumpers.	1	10	7	70	
MAC-5	Machinery	Skidding of dumpers due to Non-functioning of brakes in front wheels.	1	10	7	70	
MAC-6	Machinery	Proper hoisting arrangement (sling) of	5	2.5	3	37.5	

		HEMM engine is not provided at workshop.					
MAC-7	Machinery	Improper parking space for HEMM.	1	5	7	35	
MAC-8	Machinery	Improper locking of raised dump body during maintenance.	5	3	2	30	
MAC-9	Machinery	Non availability of workshop only shed provided.	0.3	10	7	21	
MAC-10	Machinery	Fire in HSD tank of dumper during welding.	5	2	1	10	
MAC-11	Machinery	Bursting of air receiver tank in HEMM.	1	10	1	10	
MAC-12	Machinery	Shortage of mechanical foreman.	0.1	10	7	7	
MAC-13	Machinery	Defunct auto fire extinguisher in HEMM.	0.1	10	7	7	
MAC-14	Machinery	Improper locking arrangement of gates in dozers	0.1	10	7	7	
MAC-15	Machinery	Wearing loose garments near moving parts of machinery.	0.3	5	3	4.5	
MAC-16	Machinery	Pumps running without Coupling guard .	0.3	3	3	2.7	
MAC-17	Machinery	Feeble horn in all dozers.	0.1	5	7	3.5	
MAC-18	Machinery	Avoiding use of battery cut-off switch while working on engine of HEMM.	0.1	5	7	3.5	
MAC-19	Machinery	Fire in HEMM due to overheating of turbochargers and oil leakage.	0.1	10	3	3	
MAC-20	Machinery	Fire in dumper due to rusting in exhaust pipe.	0.1	10	2	2	
MAC-21	Machinery	Maintenance during running engine.	0.3	2	3	1.8	

MAC-22	Machinery	Running of dumper with raised dump body.	0.3	2	3	1.8	
MAC-23	Machinery	Rolling back of Dozers while working.	0.3	2.5	2	1.5	
MAC-24	Machinery	Working at drill mast-Hammering of drill rod at height.	0.1	2.5	3	0.75	
MAC-25	Machinery	Fall of person from the boom of excavator while working on it.	0.1	2.5	3	0.75	
MAC-26	Machinery	Working at drill mast-for repair of broken feed chain.	0.1	2	3	0.6	
MAC-27	Machinery	Un-controlled movement of backhoe boom while engine stops.	0.1	2	2	0.4	
MAC-28	Machinery	Opening of hot radiator cap of diesel engine.	0.001	5	2	0.010	
MAC-29	Machinery	Slippery workplace and drill mast ladder due to bursting of hose.	0.001	2.5	3	0.0075	
MAC-30	Machinery	Clearing of big boulders, entangled between dozer blade and engine radiator guard.	0.001	2	2	0.004	
MAC-31	Machinery	Improper locking of drill mast pin.	0.0001	5	1	0.0005	
MAC-31A	Machinery	Slippery workplace and inadequate space for turning of water tanker	4	6	1	24	30.11.2020 accident

Control Plan:- Machinery.

Abbreviations:RSP-Relevant Statutory Provisions; **DGC**- DGMS Circulars; **MG**-Management Guidelines; **ERCI**-Existing Risk Control Index; **Res**- Responsibility; **Med**- Medium; **Reg**- Regulation of draft Coal Mines Regulations'2015; **Ru**l (T); Rule of Mine Vocational Training Rules' 1966; **SOP**- Standard Operating Procedure. |B-Yellow Flag

Control Plan as per Risk Ranking(Machinery)

HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments
MAC-1	Machinery	Running of dumper without safety features-rear view mirror; Side view mirror,blind spot mirror.	1. Ensure not running of dumpers without rear view mirrors,Side view mirror,blind spot mirror. 2. Provide sufficient parking space to omit damage of mirror. 3. Maintaining sufficient spare stock.	DGC Tech No.- 5/2010, Reg. 216	1.Devise a mechanism to treat such machine as breakdown. 2. a)Disposal of scrap for expansion of parking space b). Conversion of old workshop into parking space. 3. Devise a mechanism for maintaining sufficient spare stock.	Low	1. Manager,PE(X) 2. a)Agent, Area Material Manager b) Agent , S.O. (Civil) Area G.M 3. PE(X) S.O. (Ex.), Area Material Manager.	1. To be put in place within one week. **(YF)** 2. a) To be done in one month. **(YF)** b) To be done within 1.5 years. 3. To be done within four months.

MAC-2	Machinery	Running of dumper without safety features (rear view camera,automaticdipper,proximity warning, tail gate protection, fatigue sensing device).	1. a) Ensure not running of dumpers without rear view camera,proximitywarning,Seat belt b) Procurement of automatic dipper tail gate protection, fatigue sensing device. 2. Maintaining sufficient spare stock.	DGC Tech No.- 5/2010, Reg. 216	1.a)Devise a mechanism to treat such machine as breakdown. b) Devise a mechanism for procurement of automatic dipper tail gate protection, fatigue sensing device. 2. Devise a mechanism for maintaining sufficient spare stock.	Med.	1. a)Manager,PE(X) b) Agent., PE(X), S.O. (X), S.O. (MM). 2. PE (X), S.O. (X), Area Material Manager.	1. a) within one week. **(YF)** b) within six months. 2. within four months.
MAC-3	Machinery	Feeble horn in dumpers	1. Running of Dumpers within restricted speed till the correction of horn-sound	DGC Tech No. 02 dt. 17/05/2015 & Reg. -216	1. To consult the service engineer for proper rectification.	Med.	1. PE (X)	1. one months. **(YF)**

MAC-4	Machinery	Poor parking brake in dumpers.	1. Ensure brake testing of all dumpers. 2. As soon as parking brake fails dumper to be treated as breakdown. 3. Ensure parking of BEML dumper in level ground .	DGC Tech No. 04/2012, Reg. 216	1.a) Daily checking of all brakes by rpm based method will be done on level ground & parking brake of beml dumper will be checked on gradient road .Record will be maintained signed by operator & concerned supervisor. b). Fortnightly checking of all brakes in loaded condition will be done & record thereof will be maintained signed by operator & concerned supervisor. 2. Devise a mechanism to treat such machine as breakdown 3. Prepare a SOP for parking of dumpers.	Med.	1a). workshop incharge , Engineer Incharge, PE.(X) b) workshop incharge , Engineer Incharge , PE. (X). 2. Manager, PE.(X). 3. Manager , PE.(X)	1.a)Immediate. **(YF)** b).Immediate 2. One week. 3. One Week.

MAC-5	Machinery	Skidding of dumpers due to Non-functioning of brakes in front wheels	1. Stoppage of operation of such machine 2. Immediate replacement of brake disc.	DGC Tech No. 04/2012,reg. 216	1. Written Instruction to be given to concerned Shift Manager. 2. Vigorously follow-up with OEM.	Med	1. Manager, PE (X) 2. PE (X)	1.Immediate. 2.Immediate. **(YF)**
MAC-6	Machinery	Proper hoisting arrangement (sling) of HEMM engine is not provided at workshop.	1.Procurement of Sling of adequate strength. 2. Testing of strength of existing slings and keeping a certificate thereof.	reg.215	1. Devise a mechanism for procurement of sling of adequate strength. 2. Carrying out proof load test of slings every year at NABL approved Lab.	Med.	1. PE(X), S.O. (X), Area Material Manager 2. PE (X)	1. Three months. **(YF)** 2. Two months. **(YF)**

HAZ NO	HAZARD	Mechanism	Control	RSP/DGC/MG	Procedure	ERCI	Res	Comments
MAC-7	Machinery	Improper parking space for HEMM.	1.Provision of sufficient parking space at present workshop area. 2.Construction of new workshop as per PR.	DGC . 08 dt. 09/10/2003	1.Disposal of scrap material from present workshop. 2.Possession of land for new workshop.	Low	1.Agent,SO(MM, PE(X. 2.Agent , GM(Area), SO(L&R).	1.To be completed in one months. **(YF)** 2.To be completed in six months.
MAC-8	Machinery	Improper locking of raised dump body during maintenance.	1. Ensure proper Locking during maintenance by concerned competent person.	Reg.216	1. Written Instruction to be given to concerned Engg. Incharge 2. Preparation of maintenance SOP.	Med	1. Manager, PE (X) 2. PE (X), Workshop Incharge	1.Immediate. 2. one week.
MAC-9	Machinery	Non availability of workshop only shed provided.	1. construction of new workshop.	DGC. 08/2003.	1. Acquisition of land for workshop. 2. Construction of workshop as per approved design.	Low	1. Agent , GM (Area) SO(L&R) 2. Agent , GM(Area) , SO(Civil)AHQ.	1. six months. 2. One Year from the date of acquisition of land.
MAC-10	Machinery	Fire in HSD tank of dumper during welding .	1. Proper precaution shall be taken before starting welding in HSD Tank.	DGC Tech No. 01/697 , Dt. 14/08/ 2008 &DGC. 10/2004.	1. SOP to be prepared.	High	1. Manager, PE(X) .	1. one week.

MAC-11	Machinery	Bursting of air receiver tank in HEMM.	1. Ensure proper working of load-unload valve and safety valve. 2. Hydraulic pressure testing and NDT of air receivers tanks in HEMM shall be carried out atleast in three year.	DGC 7/2003, Reg. 210 of CMR,1957	1.a) Regular draining of water from air receiver tanks. b) periodic checking of load-unload valve and safety valve. 2. Carrying out job from approved agency and keeping certificates thereof.	Low	1. PE(X), SO (X) 2. PE(X), SO(Ex)	1. Six months 2. Six months
MAC-12	Machinery	Shortage of mechanical foreman.	1. Recruitment of Mechanical Foreman. 2. supervision to be done by concerned Engineer and sr. Fitters.	Reg. 217(iii) of CMR 2017.	1. To be provided by Headquarter as per approved Manpower Budget.	Low	1. GM, APM, Agent	1. one year.
MAC-13	Machinery	Defunct auto fire extinguisher in HEMM.	1. Repairing and refilling of auto fire system. 2. Provision of portable fire extinguishers immediately.	DGC 9/2008,	1. Authorised repairers will be engaged. 2. Immediate portable fire extinguishers will be placed	Med	1. PE(X), SO(X.) 2. Manager, Sr.Overman.	1. Four months. **(YF)** 2. Immediate.

MAC-14	Machinery	Improper locking arrangement of gates in dozers.	1. Ensure Double locking arrangements. 2. Regular inspection of door lock. 3. Restrict overspeeding of dozers.	DGC. 09/2008,	1. Proper lock supplied by OEM shall be fitted 2. Replacement of door lock shall be done immediately 3. Preparation of SOP.	Med	1. PE(X.), SO(X) 2. Workshop Incharge 3. Manager, P.E(X.)	1. Immediate. 2. Immediate. 3. one week.
MAC-15	Machinery	Wearing loose garments near moving parts of machinery .	1. Ensure non entry of persons wearing loose garments.	Reg. 211(6)	1. Attendance will not be marked of the persons wearing loose garments.	High	1. Shift Manager , MTK	1. Immediate.
MAC-16	Machinery	Non-provision of coupling guard of dewatering pump.	1. Stoppage of operation if guard is not fitted.	DGC Tech No. 12/1983, Reg. - 211.(2)	1.a) Written Instruction to be given to concerned Shift Manager. b) Preparation of SOP for pump operation.	High	1. a) Manager, PE (E&M). b) Manager, PE(E&M)	1.a)Immediate. b) One week.
MAC-17	Machinery	Feeble horn in all 4 dozers.	1. Ensure the improvement of sound in dozer horn.		1. The circuit related with horns will be checked.	Med	1. Workshop Incharge and Sr. Fitter.	1. Immediate.
MAC-18	Machinery	Avoiding use of battery cut-off switch while working on engine of HEMM.	1. Ensure uses of battery cut-off switch while working on HEMM	DGC. 11/1983 & DGC.09/2008,	1. SOP to be prepared .	High	1.Manager , Workshop Incharge	1. one week.

MAC-19	Machinery	Fire in HEMM due to overheating of turbochargers and oil spray.	1. Regular inspection of turbocharger hose. 2. Ensure fitting of turbocharger guard 3. Ensure proper working of auto fire suppression system.	DGC Tech No.09 dt. 02/12/2008 & DGC.03 Dt.14/03/2016.	1. Daily checking of hose for any oil leakage and recording in the checklist. 2. Turbocharger guard will be made available. 3. Auto fire system will be repaired and refilled immediately.	Med.	1. workshop Incharge , Sr. Fitter 2. Workshop Incharge 3. Agent , PE(X.)	1. Immediate. 2. Immediate. 3. Three Months.
MAC-20	Machinery	Fire in dumper(BEML 60) due to rusting in exhaust pipe.	1. Daily inspection of exhaust pipe.	DGC Tech No. 01/697 , Dt. 14/08/ 2008.	1. Replacement of exhaust pipe. 2. Maintain sufficient stock of exhaust pipe at unit store.	High	1. Workshop Incharge, Depot Officer, Sr. Fitter. 2. PE(X), SO(X.), SO(MM).	1. one month. 2. Three months.
MAC-21	Machinery	Maintenance during running engine.	1. Avoid maintenance of machine during running engine.	DGC. 11/1983 , Reg. 211(4,5)	1.SOP shall be prepared for the same.	High	1. Manager , PE(X).	1. one week.
MAC-22	Machinery	Running of dumper with raised dump body.	1. Proper training to increase awareness to dumper operator shall be given.	Reg.239	1. Daily pit safety talk for awareness. 2. Arrange for special training of dumper operators.	High	1.Shift Incharge 2.Area training officer.	1.Immediate.
MAC-23	Machinery	Rolling back of Dozers while working due to gear problem.	1. Proper checking & maintenance of transmission control valve & linkage shall be done.	DGC Tech No.09 dt. 02/12/2008	1. Daily checking of the same shall be done.	Med	1. Workshop incharge , senior fitter.	1.Immediate. **(YF)**

MAC-24	Machinery	Working at drill mast-Hammering of drill rod at height.	1. Safety belt shall be used for any repair of drill mast.	DGC. 03/2006, Reg.213	1. SOP shall be prepared for the same.	Med	1. Manager, PE(X.)	1. One week.
MAC-25	Machinery	Fall of person from the boom of excavator while working on it.	1. Safety belt shall be used while working on boom of excavator.	DGC. 03/2006,Reg.213	1. SOP shall be prepared for the same.	Med	1. Manager, PE(X.)	1. One week.
MAC-26	Machinery	Working at drill mast-for repair of broken feed chain.	1. Safety belt shall be used for any repair of drill mast.	DGC. 03/2006, Reg.213	1. SOP shall be prepared for the same.	High	1. Manager, PE(X).	1. One week.
MAC-27	Machinery	Opening of heated radiator cap of diesel engine.	1. Increasing awareness among fitters.	Reg.213	1. Regular discussion among workmen .	Med	1.PE(X),Foreman I/c, Sr. Fitter.	1.Immediate.
MAC-28	Machinery	Slippery workplace and drill mast ladder due to bursting of hose.	1. Proper housekeeping of machines.	DGC. 09/2008 , Reg.213	1. Daily checking, cleaning and periodical washing of machines shall be done	Med	1. Field In charge	1.Immediate.
MAC-29	Machinery	Uncontrolled movement of backhoe boom while engine stops.	1. Positioning of machine shall be done on level ground.	DGC. 09/2008, Reg.211	1. Dozer shall be engaged for preparation of level face at the start of every shift.	Med	1. Shift Manager , Overman	1.Immediate.

MAC-30	Machinery	Clearing of big boulders, entangled between dozer blade and engine radiator guard.	1. Imparting training to operators to avoid pushing over blade materials.	Reg.213	1. Safety talk at the start of the shift.	High	1. Shift Manager , Overman	1.Immediate.
MAC-31	Machinery	Improper locking of drill mast pin.	1. Ensure proper Locking during operation.	DGC. 09/2008, Reg.213	1. Written Instruction to be given to concerned operator.	Med	1. Manager , Shift Incharge	1.Immediate.
MAC-31A	Machinery	Slippery workplace and inadequate space for turning of water tanker	1.water tanker operator will consult with supervisor before going to face. 2.operator will be allowed to that place if the road/face is of sufficient width and of suitable gradient and berm of sufficient strength on edges. 3. he will not be allowed to drive vehicle in reverse gear with discharging water.		1.SOP provided to every operator	Med	1. Manager , Shift Incharge	1.Immediate

Manintemance Schedule for E&M Equiptments

Sl.	Equiptment Details	Checks	Periodicity
1	SF6 Circuit Breaker	Master Trip Relay	3 months(Manual Tripping)
		Earth Fault Relay	3 months (Manual Tripping)
		Over Current Relay	3 months(Manual Tripping)
		Restricted Earth Fault relay	3 months (Manual Tripping)
		DC fail	Weekly (Manual Check)
		Gas Pressure	Weekly Visual Inspection
		Winding Temperature	3 months (Manual Tripping)
		Oil Temperature	3 months (Manual Tripping)
2	VCB's	Earth Fault Relay	3 months(Manual Tripping)
		O/C Relay	3 months (Manual Tripping)

		U/V Relay	3 months(Manual Tripping)
3	Motor	Insulation Resistance	3 months
		Greasing	Annual
4	Transformers	Insulation Resistance	3 months
		Dielectric Strength of Oil	3 months
		Buccholz Relay	3 months(Manual Tripping)
		Oil Temperature	Daily
		Winding Temperature	Daily
		Breather for Silica Gel	6 months (as per requirement)
5	HT starter	E/L Relay	3 months(Manual Tripping)
		O/C Relay	3 months (Manual Tripping)
		Under Voltage Relay	3 months(Manual Tripping)
		Single Phase Preventer	3 months Manual Check
		Isolator	3 months (Cleaning)
6	HT Cables	Insualtion Resistance	6 months
7	Weigh Bridges	Earthing Resistance	3 months
		Visual inspection for wear &Tear of Structure	Weekly
		Dust Cleaning	Daily
		Over all Maintenace	Annualy
8	Pumps	Bearing Greasing	Weekly
		Tighten of Nut & Bolt Checks	Weekly
		Check Pump for any Water Leakages	Daily
		Bearing Temperature Checks	Daily (by Manual hand touch)
		Check for Gland Packing wear & Tear	Weekly
		Check for Oil leakage (If Provided)	Daily

		Oil replacement	Monthly
		Check for Fittings such as Valves Etc.	Daily (Visual Check)
		Check for Any abnormal noise & Vibration	Daily
		Check for Coupling belts/Tyre Coupling	Weekly
		Over all Maintenance	Annually

Hazard Identification(Loading/Unloading, wagon loading at R R Siding).

Sl.No	Category	Hazard
1	Loading by payloader	Over crowding of machinery
2	Loading by payloader	Fatigue of operator's/Driver's
3	Loading by payloader	Lack of skilled operator's
4	Loading by payloader	Inadequate width loading plateform
5	Loading by payloader	Traffic rules not following
6	Unloading by transporting vehivle	Fall of person from plateform
7	Machinery	Running of payloader without safety features
8	Machinery	Rolling back of pay loader or transporting vehicle
9	Machinery	Fire in payloader or transporting vehicle due to overheating
10	Machinery	Inadequate lighting
11	Track line cleaning	Railway wagon placing by railway

Risk Ranking(Loading/Unloading, wagon loading at R R Siding)

HAZ NO	HAZARD	MECHANISMS	CALCULATED RISKS				Comments
			CONS	EXPS	PROB	RISK RATING	
1	2	3	4	5	6	7	8

RRS-1	Over crowding of machinery	Adequate width of plateform is not provided (Plying of other vehicles in Siding).	5	5	3	75	
RRs-2	Fatigue of operator's/Driver's	Fatigue to driver/ operator due to overtime work	1	10	7	70	
RRS-3	Lack of skilled operator's	Proper training required	1	10	3	30	
RRS-4	Inadequate width loading plateform	Loading plateform to be sufficient width for safe movement of vehicle/machinery.	1	10	3	30	
RRS-5	Traffic rules not following	Traffic rule not followed.	1	10	3	30	
RRS-6	Fall of person/machinery from plateform	Inadequate berm along the edge of loading plateform	0.3	10	3	9	
RRS-7	Running of payloader and dumper without safety features	Running of dumper without safety features (rear view camera, automaticdipper,proximity warning, tail gate protection, fatigue sensing device).	5	5	3	75	
RRS-8	Rolling back of pay loader or transporting vehicle	Inadequate drainage along haul road.	0.3	2	2	1.2	
RRS-9	Fire in payloader or transporting vehicle due to overheating	Cleaning of oil/lubricant which is inflamable	1	3	4	12	
RRS-10	Inadequate lighting	Installation of high mast lighting tower	3	2	5	30	
RRS-11	Derailment of railway wagon during placing by railway	Regular maintenance of track line	3	1	5	15	

CONTROL PLAN – Loading/Unloading, wagon loading at R R Siding

HAZ NO.	HAZARD	Mechanism	Control	RSP/DGC/ MG	Procedure	ERCI	Resp	Comments
RS-1	Loading/Unloading and wagon loading at R R Siding	Fatigue to dumper operator due to overtime.	1. Provision of Sufficient dumper operator. 2. Absentism of dumper operator will be controlled.	Mine rule-47 &48.	1. Adequate no, of dumper operators shall be appointed. 2. Close monitoring of leave/ sick of dumper operator 3.Programme for improving attendance should be conducted	Med.	1.Agent,APM), Manager,SiteIncharge(. BCM). 2. Manager , Shift incharge&Overman,SiteIncharge(, BCM). 3Personnel officer,Site Incharges of contractors.	1. One Month 2. Immediate. 3One Week

RS-2	Loading/Unloading and wagon loading at R R Siding	Non engagement of skilled persons.	1. Engagement of only skilled persons in electrical works.	VT Rule-13.	1. Devise a mechanism for engaging only VTC trained persons especially for electrical works.	Low	1. Manager, PE(E&M).	1.Immediate. **(YF)**
RS-3	Loading/Unloading and wagon loading at R R Siding	Inadequate width of haul road.	1.Provide haul road with adequate width.	DGC. 09/2008 ,Reg. 101	1.Widening of the haul rtoad shall be done where necessary	Med.	1.Manager,Haul Road.I/c,	1.One Month.
RS-4	Loading/Unloading and wagon loading at R R Siding	Traffic rule not followed.	1.Display of traffic rule at conspicousplaces es 2. Implementation of traffic rule.	DGC Tech no. 02/1989,	1.Traffic rule shall be displayed at conspicuous place. 2.Awarness among HEMM operator regarding traffic rule by daily safety talk at start of the shift. 3.SOP shall be formulated 4.Implementation of SOP	Med.	1 .Safety Officer. 2. R. R. Siding Incharge 1. Loading supervisors. 3.Manager, 4. . R. R. Siding Incharge	1. Immediate 2. Immediate. **(YF)**

RS-5	Crowding of transport and other vehicles	Simultaneous loading and unloading of coal from the same place in coal dump.	1. Avoid Simultaneous loading and unloading of coal from the same place in coal dump. 2. Provide and allocate separate place for loading and unloading in coal stock. 3. Provision of parking yard .	DGC Tech no. 02/1989	1. SOP shall be prepared and implemented. 2. Use one stock for loading and separated another stock for unloading . 3. Parking yard shall be established near coal dump.	Med.	1. Manager, Dispatch Officer . 2.,Dispatch Officer , Supervisor, loading incharge. 3. Dispatch Officer ,Supervisor SECURITY Incharge,.	1. One week. 2.Immediate. **(YF)** 3.Immediate.
RS-6	Loading/Unloading and wagon loading at R R Siding	Running of dumper without safety features (rear view camera, automaticdipper, proximity warning, tail gate protection, fatigue sensing device).	1. a) Ensure not running of dumpers without rear view camera,proximitywarning,Seat belt b) Procurement of automatic dipper tail gate protection, fatigue sensing device.	DGC Tech No.- 5/2010, Reg. 216	1.a)Devise a mechanism to treat such machine as breakdown. b) Devise a mechanism for procurement of automatic dipper tail gate protection, fatigue sensing device.	Med.	1. a)Manager,PE(X) b) Agent., PE(X) , S.O. (X), S.O. (MM).	1. a) within one week. **(YF)** b) within six months.

			2. Maintaining sufficient spare stock.		2. Devise a mechanism for maintaining sufficient spare stock.		2. PE (X), S.O. (X), Area Material Manager .	2. within four months.
RS-7	Loading/Unloading and wagon loading at R R Siding	Rolling back of pay loader or transporting vehicle.	1. Proper checking & maintenance of transmission control valve & linkage shall be done. 2. Berm at the edge of loading plateform	DGC Tech No.09 dt. 02/12/2008	1. Daily checking of the same shall be done. 2. Construction of breaker at the plateform edge.	Med	1. Workshop incharge , senior fitter. 2. Civil Engineer	1 .Immediate . **(YF)**
RS-8	Loading/Unloading and wagon loading at R R Siding	Fire in payloader or transporting vehicle due to overheating	1. Daily inspection of exhaust pipe. 2.Oil and lubricant Cleaning.	DGC Tech No. 01/697 , Dt. 14/08/ 2008.	1. Replacement of exhaust pipe. 2. Maintain sufficient stock of exhaust pipe at unit store. 3. no such inflammable material should leakage.	Hig h	1. Workshop Incharge , Depot Officer, Sr. Fitter. 2. PE(X), SO(X.), SO(MM).	1. one month. 2. Three months.

RS-9	Loading/Unloading and wagon loading at R R Siding	Inadequate illumination in loading plateform	1. Illumination survey at regular intervals. 2. Provide adequate lighting arrangement in loading platefor	,DGC Tech No. 06 of 2016.	1. Illumination survey shall be conducted at monthly basis. 2. sufficient no. of light fixture will be installed.	Med.	1.Manager,PE 2. Agent,P.E. (E&M),SO(E&M	1. Immediate & thereafter monthly. **(YF)** 2. One Month. **(YF)**
RS-10	Heavy dust in traspo - rtation	Dusty haul road.	1. Ensure sufficient water spraying on haul road . 2. Ensuring the availablity of standby Water Tanker.	,DGC Tech No. 05/1987, Reg. -143. CMR-2017	1.28KL Water tanker shall be used for water spray on haul road. 2.The breakdowns of water tanker will be attended immediately by keeping adequate spares. 3.Proposal sent for stand by water tanker 4.Timely sending proposal for water tanker	High	1. Shift incharge,Overman. 2. P.E.(X,SO(X SO(MM,Reg.Store Manager(MM). 3.P.E.(X),SO(X), GM(RGH) 4 PE(X)	1.Immediate. **(YF)** 2.Immediate. **(YF)**

List of S.O.P

1. Lifting heavy material by crane
2. Welding work
3. Shut down process While working on OH Line
4. While working on elect. Apparatus and regarding inter locking .
5. Shut down process while working in electrical system
6. Not using mobile phone while working in mines
7. Loading, unloading at coal stock
8. Use of blasting shelter
9. Drilling and charging
10. Operation of Dozer
11. Rnnning of pumps/ for pumpers.
12. Parking of Dumpers..
13. Working near highwall
14. Pilferage of explosive.
15. Safe transport of explosive.
16. Working on shovel boom
17. Working on Drill mast.
18. Mainterance on runing engine of HEMM

19.Working on HEMM
20.Welding on diesel tank.
21.Crossing Public road by dumpers
22.Removal of O.B.
23.Working near waterlogged Dharam incline.
24. Over burden dumping.
25. Operation of Surface Miner coal cutting machine.
26. Pay loader operator.
27. Trailor/Truck operator on Road sale.
28. P.C. operator.
29.OB/Coal transporting vehicle.
30.Operator of transporting vehicle at R.R. Siding.
31. Controlled blasting.
32. Water Tanker Operator SOP.