





Model Curriculum

Mechatronics-In-Charge

SECTOR: Mining SUB-SECTOR: Open Cast and Underground Mines OCCUPATION: Instrumentation Maintenance REF ID: MIN/Q0438, V1.0 NSQF LEVEL: 4













TABLE OF CONTENTS

1. Curriculum	01
2.Trainer Prerequisites	04
3. Annexure: Assessment Criteria	05





Mechatronics In-charge

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "<u>Mechatronics In-Charge</u>", in the "<u>Mining & Allied</u>" Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Mechatronics In-Charge			
Qualification Pack Name &	MIN/Q0438, V1.0			
Reference ID.				
Version No.	1.0	Version update date	15.12.2018	
Pre-requisites to Training	Class XII			
Training Outcomes	After completing this program, participants will be able to:			
	Identify the mech Conduct mechat	natronics equipment		
	Operate the med	chatronics equipment		
	Repair and main	tain mechatronics equipme	nt.	
	 Integrate electric systems. 	cal and mechanical system	ns to enhance manufacturing	
	 Design and prototype mechatronic devices with motors, solenoids, gears, sensors and springs. 			
	 Monitor or calib system component 	 Monitor or calibrate automated systems, industrial control systems, or system components to maximize efficiency of production. 		
	Create graphical	Create graphical representations of mechanical equipment		
	Create document	Create documentation on time as per organizational requirements.		
	 Comply with occupational health and safety regulations adopted by the employer. 			





This course encompasses <u>3</u> out of <u>3</u> National Occupational Standards (NOS) of "Mechatronics In-charge" Qualification Pack issued by "Skill Council for Mining Sector".

Sr. No.	Module	Key Learning Outcomes	Equipment Reguired
1	Introduction Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 26:00 Corresponding NOS Code Bridge Module	 Explain the role of Mechatronics In-charge in mining industry. Describe benching in quarries. Identify dressing of overhangs, undercuts, fencing. Define importance of first aid and hygiene. Illustrate the standing orders in force at the mine. Characterize the shot-firing and safety regulations. Demonstrate the procedure of taking shelter during blasting. Apply the basic skills of communication. 	Projector System, Posters, Graph etc.
2	Conduct mechatronics operations Theory Duration (hh:mm) 40:00 Practical Duration (hh:mm) 190:00 Corresponding NOS Code MIN/N0505	 Choose the appropriate mechatronics equipment required for various work Explain the software coding, programming logic, electrical connections logic, hardware requirements, robotic parameters and its operation sequence etc. as per the applicability of the system Interpret mechanical & electronic technical drawing Operate the automation panel/control mechanism for the equipment and apply advanced electronic control systems, which are usually computer driven Read the mechatronics equipment readings continuously while in operation and gather statistical data Follow the quality control procedure and ensure compliance of the operations to the same Determine the fabrication requirements of the mechanical parts and conduct the same Correlate and detect the proper system functioning and resolve the issues observed. 	P.T. single phase, Auto transport 0-300 V, 8 Amp Audio signal generator DC power supply 0-30 V & 2 Amp, Demonstration model for thyristorised DC motor drive (1 HP) set, Demonstration model for thyristorised AC motor drive (1 HP), Linear I.C., Digital multi-meter, Transducer, Photo diode, Photo transistor kit, AC timer kit, DC timer kit, Dc motor Hand tachometer, Ammeter, Insulated handle screw driver combination side cutting plier
3	Repair and maintain the equipment Theory Duration (hh:mm) 22:00 Practical Duration (hh:mm) 140:00	 Prepare a performance management schedule for the mechatronics system Inspect the systems and identify the replacements required as per the schedule. Check internal conditions of wiring, motherboards, software/ hardware malfunctioning, circuit failures etc. to verify working status to expected conditions. Discuss with the user/ operator to learn about problems /unusual phenomenon noticed in the systems 	Vernier caliper, Outside micrometers, Feeler gauge and Radius gauge, Indicator with magnetic base, Adjustable micrometer, Diagonal cutter, Tweezers Knife, Neon tester, Soldering iron 25 W & 65 W, Multimeter, Ammeter, Ammeter, Voltmeter, Discrete component







 Corresponding NOS Code MIN/N0506 Execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc. Check all the systems are integrated through computer interface Check all the systems are integrated through computer interface Check all the system by replacing the computer interface Analyze that the software used for system interfacing are upgraded as per the process requirement Maintain a record of all system (2D/3D - as built drawings, equipment operation related diagrams, program codes etc.) in a legible and safe condition. Comply with occupational health and safety regulations adopted by the employer. Follow mining operations procedures with respect to materials handling and accidents Follow the correct safety steps in case of fire, accident, major failure Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS. Comply with asfety regulations and procedures in case of fire hazard. Operate various grades of fire extinguishers. Demonstrate careful practices while operating on heavy machinery. Identify characteristics of post-blast fumes and take necessary precautions. 	Corresponding NOS Code MIN/N0506	 Execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc. Check all the systems are integrated through a computer interface. 	trainer P.F. Meter, Frequency meter, Megger 500 V. AC squirrel cage induction motor 30
 Health and Safety Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 62:00 Corresponding NOS Code MIN/N0901 Corresponding NOS code MIN/N0901		 Reconstruct the system by replacing the defective part/section with appropriate sensors. Analyze that the software used for system interfacing are upgraded as per the process requirement Maintain a record of all system (2D/3D- as built drawings, equipment operation related diagrams, program codes etc.) in a legible and safe condition. 	with D.O.L. starter, Star delta 30 starter, C.T. single phase, Thermocouple kit, L.D.R.S. kit, Thermistor kit, L.V.D.T. kit
	4 Health and Safety Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 62:00 Corresponding NOS Code MIN/N0901	 Comply with occupational health and safety regulations adopted by the employer. Follow mining operations procedures with respect to materials handling and accidents Follow the correct safety steps in case of fire, accident, major failure Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS. Comply with safety regulations and procedures in case of fire hazard. Operate various grades of fire extinguishers. Demonstrate careful practices while working near blasting zone. Demonstrate careful practices while operating on heavy machinery. Identify characteristics of post-blast fumes and take necessary precautions. 	Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts
Total Duration Unique Equipment Required:	Total Duration	Unique Equipment Required:	
Theory Duration 92:00Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt Gum Boots/ Safety shoes, LCD Projector,Practical	Theory Duration 92:00 Practical	Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Gum Boots/ Safety shoes, LCD Projector,	e Jacket, Safety Belt
Duration	Duration		
Duration	418:00		

Grand Total Course Duration: 510 Hours, 0 Minutes (This syllabus/ curriculum has been approved by SSC: Skill Council for Mining Sector)





Trainer Prerequisites for Job role: "Mechatronics In-charge" mapped to Qualification Pack: "MIN/Q0438", V1.0

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack <u>"MIN/Q0438", V1.0</u> .
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Diploma
4a	Domain Certification	Certified for Job Role: "Mechatronic In-Charge" mapped to QP: <u>"MIN/Q0438, V1.0"</u> . Minimum accepted score as per SSC guideline is 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score as per SSC guideline is 80%.
5	Experience	For Diploma in Mechanical / Electronics/ Instrumentation/ Automation - 6 Years. For B.Tech. in Mechanical / Electronics/ Instrumentation - 5 Years. For M. Tech. in Mechanical / Electronics/ Instrumentation - 4 Years.





Annexure: Assessment Criteria

Assessment Criteria for Banksman	
Job Role	Mechatronics In-Charge
Qualification Pack	MIN/Q0438
Sector Skill Council	Skill Council for Mining Sector

Guidelines for Assessment

- 1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
- 2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
- 3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
- 4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.
- 5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.
- 6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

				Marks A	llocation
		Total Mark (100)	Out Of	Theory	Skills Practica I
1. MIN/ N 0505 (Conduct mechatronics operations)	PC1. understand the work output requirements and finalize various specifications of the mechatronics machinery	35	4	2.5	1.5
	PC2. understand the software coding , programming logic , electrical connections logic, hardware requirements, robotic parameters and its operation sequence etc. as per the applicability of the system		4	2.5	1.5
	PC3. translate mechanical & electronic technical drawing		4	2.5	1.5
	PC4. operate the automation panel/control mechanism for the equipment and apply advanced electronic control systems, which are usually computer- driven		5	2.5	2.5
	PC5. read the mechatronics equipment readings continuously while in operation and gather statistical data		5	2.5	2.5
	PC6. understand the quality control procedure and ensure compliance of the operations to the same		5	2.5	2.5









PC7.understand the fabrication requirements of the mechanical parts and conduct the same42.51.5PC8.continuously monitor the system functioning and resolve the issues observedTotal3520152.MIN/ N 0506 (Repair and maintain the equipment)PC1.prepare a performance mechatronics system/s3542.51.5PC2.basis the schedule , inspect the systems and identify the replacements required3542.51.5PC3.check / confirm internal conditions of wiring, motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4.discuss with the user/ operator to learn about problems/unusual phenomenon noteced in the systems222PC5.execute sequence of activities for changing , correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc.42.51.5PC5.execute sequences of altive systems are integrated through a computer interface42.51.5PC6.ensure that all the systems are process requirement22422PC7.mean the splace of alt the vendor and system 20/3D- as built drawings. equipment operation related diagrams, program codes etc. in a legible and safe condition321PC5.PC1. Comply with occupational health and asfety regulations adopted by the employer.30321PC5.PC1. Comply						
requirements of the mechanical parts and conduct the same42.51.5PC8. continuously monitor the system functioning and resolve the issues observedTotal42.51.52. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare a performance management schedule for the mechatronics systems, required3542.51.5PC2. basis the schedule inspect the systems and identify the replacements required3542.51.5PC3. check / confirm internal conditions of wiring, motherboards, software/hardware mafunctioning, circuit faitures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systemsPC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact insultation conditions, failure of internal wires etc42.51.5PC5. ensure that all the systems are integrated through a computer interface321PC6. ensure that all the systems are integrated through a computer interface321PC5. ensure that ereplacements oditionPC6. ensure that all the systems are integrated through a computer interface42.52.242.222PC5. ensure that energing are upgraded as per the process requirement321PC6. ensure that all the systems are integrated through a computer interface422PC7. ensure the replacements requirement operation related dia		PC7. understand the fabrication				
conduct the same142.51.5PC8. continuously monitor the system functioning and resolve the issuesTotal42.51.52. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare a performance mechatronics system/sTotal352015PC2. basis the schedule, inspect the systems and identify the replacements requiredPC2. basis the schedule, inspect the systems and identify the replacements required conditions of wiring, motherboards, software/hardware mafunctioning, circuit failures etc. to verify working status to expected conditions42.51.5PC3. check / confirm internal conditions of wiring, motherboards, software/hardware mafunctioning, circuit failures etc. to verify working status to expected conditions42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. ensure that all the systems are integrated through a computer interface process requirement2.51.542.51.5PC5. ensure that all the systems are integrated through a computer interface process requirement2.51.5422PC5. ensure that all the systems are integrated through a computer interface process requirement4222PC5. ensure that all the systems are integrated through a computer interface process requirement4222PC5. ensure that all the systems are integrated through a conditions of process requirement321PC5. Comply		requirements of the mechanical parts and				
PC8. continuously monitor the system functioning and resolve the issues observedTotal42.51.52. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare a performance management schedule for the mechatronics system/s3542.51.5PC2. basis the schedule, inspect the systems and identify the replacements requiredPC3. check / confirm internal conditions of wiring, motherboards, software/hardware maffunctioning, circuit faitures etc. to verify working status to expected conditions.3542.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systemsPC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc422PC5. ensure the replacements required process requirementPC6. ensure that all the systems are integrated through a computer interface321PC7. ensure the replacements orditionPC3. ensure that all the software used for system interfacing are upgraded as per the process requirement321PC9. maintain a record of all the vendor and system 20/3D- as built drawings, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC3. Follow mining operations procedures with respect to materials handling and accidents.30321		conduct the same		4	2.5	1.5
Including and resolve the issues observed42.51.511520152. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare a performance management schedule for the mechatronics system/s3542.51.5PC2. basis the schedule for the mechatronics system/s3542.51.5PC3. check / confirm internal conditions of wiring , motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation after opening, verifying context insulation conditions, failure of internal wires etc42.51.5PC6. ensure that all the systems are integrated through a computer interface3211PC7. ensure the replacements of identified systems3211PC8. ensure that all the system conditions4222PC9. maintain a record of all the vendor and system 20/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe3620153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321 <td></td> <td>PC8 continuously monitor the system</td> <td></td> <td></td> <td>-</td> <td></td>		PC8 continuously monitor the system			-	
Inductioning and resolve the insides42.51.5observedrotal3520152. MIN/ N 0506 (Repair and management schedule for the mechatronics system/s3542.51.5PC2. basis the schedule, inspect the systems and identify the replacements requiredPC3. check / confirm internal conditions of wing, notherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions3542.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systemsPC4. discuss with the suser/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc42.51.5PC6. ensure that all the systems are integrated through a computer interface systems321PC7. maintain a record of all the vendor and system 20/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		functioning and reactive the issues				
Total3520152. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare a performance management schedule for the mechatronics system/s3542.51.5PC2. basis the schedule, inspect the systems and identify the replacements required3542.51.5PC3. check / confirm internal conditions of wiring, motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systemsPC5. execute sequence of activities for changing, correcting the situation conditions, failure of internal wires etc42.51.5PC5. execute sequence of activities for changing, correcting the situation conditions, failure of internal wires etc422PC6. ensure that all the systems321PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321				4	2.5	1.5
Z. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare mechatronics system/sTotal3520152. MIN/ N 0506 (Repair and maintain the equipment)PC1. prepare mechatronics system/sPC1. inspect the systems and identify the replacements required3542.51.5PC2. basis the schedule , inspect the systems and identify the replacements requiredPC3. check / confirm internal conditions of wiring , motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systemsPC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface systems321PC7. equipment operation related diagrams program codes etc. in a legible and safe condition3520153.MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		observed				
2. MIN/ N 0506 (Repair and maintain the equipment) PC1. prepare a performance management schedule for the mechatronics system/s (and maintain the equipment) 35 4 2.5 1.5 PC2. basis the schedule, inspect the systems and identify the replacements required PC3. check / confirm internal conditions of wiring, motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions. 4 2.5 1.5 PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc 4 2 2 PC6. ensure that the software used for system interfacing are upgraded as per the process requirement PC3. maintain a record of all the vendor and system 2D/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe condition 3 2 1 3. MIN/ N0901 (Health and Safety) PC1. Comply with occupational health and safety regulations adopted by the employer. 30 3 2 1 PC2. Follow mining operations procedures with respect to materials handling and accidents. PC2. Follow mining operations procedures with respect to materials handling and accidents. 30 3 2 1			Total	35	20	15
and maintain the equipment)managementscheduleforthe mechatronics system/s3542.51.5PC2. basis the schedule , inspect the systems and identify the replacements requiredPC3. check / confirm internal conditions of wiring , motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.3542.51.5PC3. check / confirm internal conditions of wiring matherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc42.51.5PC6. ensure that all the systems are integrated through a computer interface42.51.5321422PC3. maintain a record of all the vendor and system 20/30-as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321	2. MIN/ N 0506 (Repair	PC1, prepare a performance				
And matched expensionAdditionAdditionmechatronics system/smechatronics system/sadditionadditionPC2. basis the schedule , inspect the systems and identify the replacements requiredPC3. check / confirm internal conditions of wiring, motherboards, software/hardware maffunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc42.51.5PC6. ensure that all the systems are integrated through a computer interface42.51.5PC6. ensure that all the systems system interfacing are upgraded as per the process requirement321PC6. sensure that grade diagrams, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operation procedures with respect to materials handing and accidents.30321	and maintain the equipment)	management schedule for the	35			
PC2. basis the schedule , inspect the systems and identify the replacements required42.51.5PC3. check / confirm internal conditions of wiring, motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.42.51.5PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc.42.51.5PC6. ensure that all the systems are integrated through a computer interface321PC6. ensure that all the software used for systems321PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition303213.MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321	and mannam the equipment)	mechatronics system/s	55	4	2.5	1.5
PC2.Displex the scheme systems and identify the replacements required42.51.5PC3.check / confirm internal conditions of wiring, motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.422PC4.discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5.execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc42.51.5PC6.ensure that all the systems are integrated through a computer interface321PC6.ensure the replacements of identified systems321PC6.maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe303213.MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2.FOIDW mining operations procedures with respect to materials handing and accidents.30321		PC2 basis the schedule inspect the				
systems and identify the replacements required42.31.3PC3. check / confirm internal conditions of wiring, motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.422PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact insulation conditions, failures etc.42.51.5PC6. ensure that all the systems are integrated through a computer interface321PC7. ensure the replacements of identified system interfacing are upgraded as per the process requirement321PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition303213. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		PC2. Dasis the schedule, hispect the		4	2.5	15
Prequired required PC3. check / confirm internal conditions of wiring, motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.422PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for systems interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		systems and identity the replacements		4	2.5	1.5
PC3.check / confirm internal conditions of wiring mathunctioning, circuit failures etc. to verify working status to expected conditions.422PC4.discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5.execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc422PC6.ensure that all the systems are integrated through a computer interface321PC7.ensure that the software used for system interfacing are upgraded as per the process requirement322PC9.maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153.MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		required				
wiring , motherboards, software/hardware malfunctioning, circuit failures etc. to verify working status to expected conditions.422PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handing and accidents.30321		PC3. check / confirm internal conditions of				
malfunctioning, circuit failures etc. to verify working status to expected conditions.422PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		wiring , motherboards, software/hardware				
working status to expected conditions.422PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation conditions, failure of internal wires etc42.51.5PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement321PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety regulations adopted by the employer.PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		malfunctioning, circuit failures etc. to verify				
PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 20/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		working status to expected conditions.		4	2	2
PC4. discuss with the user/ operator to learn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321						
Iearn about problems/unusual phenomenon noticed in the systems42.51.5PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings, equipment operation related diagrams, program codes etc. in a legible and safe3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC1321		PC4. discuss with the user/ operator to				
noticed in the systems142.31.3PC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety regulations adopted by the employer.PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		learn about problems/unusual phenomenon		4	25	1 5
the systemsPC5. execute sequence of activities for changing, correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe conditionTotal3520153. MIN/ N0901 (Health and Safety regulations adopted by the employer.PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		noticed in		4	2.0	1.5
PC5. execute sequence of activities for changing , correcting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe conditionTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		the systems				
In OCC. Concepting the situation after opening, verifying contact/ insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		PC5 execute sequence of activities for				
A lineA lineA lineopening, verifying contact insulation conditions, failure of internal wires etc422PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		changing correcting the situation after				
Addition conditions, failure of internal wires etcA22PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		opening verifying contect/inculation				
PC6. ensure that all the systems are integrated through a computer interfacePC7. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		opening, veriging contact/insulation		4	2	2
PC6. ensure that all the systems are integrated through a computer interface42.51.5PC7. ensure the replacements of identified systemsPC8. ensure that the software used for system interfacing are upgraded as per the process requirement321PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC3. Ensure the replacement30321						
integrated through a computer interface42.51.5PC7. ensure the replacements of identified systemsPC8. ensure that the software used for system interfacing are upgraded as per the process requirement321PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC1Total3021		PC6. ensure that all the systems are				
PC7. ensure the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		integrated through a computer interface		4	2.5	1.5
1 of 1. choice the replacements of identified systems321PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC1.1321		PC7 ensure the replacements of identified				
SystemsPC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		aveteme		3	2	1
PC8. ensure that the software used for system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC2. Follow mining operations procedures.30321		Systems				
system interfacing are upgraded as per the process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4221Image: Condition of the second secon		PC8. ensure that the software used for				
process requirement422PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition422TotalTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC1321		system interfacing are upgraded as per the			0	0
PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC2. Follow mining operations procedures.30321		process requirement		4	2	2
PC9. maintain a record of all the vendor and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.303520159PC2. Follow mining operations procedures with respect to materials handling and accidents.PC2. Follow mining operations procedures.30321						
and system 2D/3D- as built drawings , equipment operation related diagrams , program codes etc. in a legible and safe condition4224223. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.303520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.303219PC2. Follow mining operations procedures with respect to materials handling and accidents.321		PC9. maintain a record of all the vendor				
equipment operation related diagrams , program codes etc. in a legible and safe condition422TotalTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.PC1321		and system 2D/3D- as built drawings ,				
program codes etc. in a legible and safe conditionIIITotalTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		equipment operation related diagrams,		4	2	2
conditionTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.303021PC2. Follow mining operations procedures with respect to materials handling and accidents.PC2321		program codes etc. in a legible and safe			-	-
TotalTotal3520153. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.303021PC2. Follow mining operations procedures with respect to materials handling and accidents.30321		condition				
TotalTotalTotal3. MIN/ N0901 (Health and Safety)PC1. Comply with occupational health and safety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.30321				35	20	15
3. MIN/ N0901 (Health and Safety) PC1. Comply with occupational health and safety regulations adopted by the employer. 30 3 2 1 PC2. Follow mining operations procedures with respect to materials handling and accidents. 30 3 2 1			Total		20	10
and Safety)result of the complexity with occupational nearth and employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.321	3 MIN/ N0901 (Health	PC1 Comply with occupational health and				
Salety regulations adopted by the employer.30321PC2. Follow mining operations procedures with respect to materials handling and accidents.321	and Safety)	safety regulations adopted by the	20			
PC2. Follow mining operations procedures with respect to materials handling and accidents. 3 2 1		amployor	30	3	2	1
PC2. Follow mining operations procedures with respect to materials321handling and accidents.321					_	
procedures with respect to materials321handling and accidents.321		PC2. Follow mining operations				
handling and accidents.		procedures with respect to materials		3	2	1
		handling and accidents.				

PC3. Follow the correct safety steps in case of fire, accident, and major failure.		3	2	1
PC4. Work responsibly and carefully so as not to put the health and safety of self or others at risk.		3	2	1
PC5. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		3	2	1
PC6. Comply with safety regulations and procedures in case of fire hazard.		3	2	1
PC7. Operate various grades of fire extinguishers.		3	2	1
PC8. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public.		3	2	1
PC9. Demonstrate careful practices in handling explosives and heavy machinery.		3	2	1
PC10. Identify characteristics of post-blast fumes and take necessary precautions.	Total	3	2	1
		30	20	10