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# NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited



Ref: BHEL/NR/SCT/RAPP KOTA/EXCAVATION/983

Date: 11/12/2014

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**NOTICE INVITING TENDER (NIT)**

**NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES**

**OR**

**PURCHASE TENDERS FROM THIS OFFICE ALSO**

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To

Dear Sir/Madam

Sub : **NOTICE INVITING TENDER**

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

**1.0 Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION	
i	TENDER NUMBER	<b>BHEL/NR/SCT/RAPP KOTA/EXCAVATION/983</b>	
ii	Broad Scope of job	Excavation work of Hard Rock –Requiring Blasting by Mechanical Means (Hydraulic Excavator/Manual Means) of Pits for Tree Plantation at 2 X 700 MW, RAPP 7 & 8 OF NPCIL.	
iii	<b>DETAILS OF TENDER DOCUMENT</b>		
a	Volume-IA	<i>Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc</i>	Applicable
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i>	Applicable
c	Volume-IC	<i>General Conditions of Contract (GCC)</i>	Applicable
d	Volume-ID	<i>Forms and Procedures</i>	Applicable
e	Volume-II	<i>Price Schedule (Absolute value).</i>	Applicable
iv	Issue of Tender Documents	<ol style="list-style-type: none"> <li><b><u>Sale from BHEL PS Regional office at :</u></b>  <b>Start : 11/12/2014, Time : 0900 Hrs (IST)</b>  <b>Closes: 01/01/2015, Time : 1200 Hrs (IST)</b></li> <li>From BHEL website (<a href="http://www.bhel.com">www.bhel.com</a>)  Tender documents will be available for downloading from website till due date of submission</li> </ol>	Applicable
v	DUE DATE & TIME OF OFFER SUBMISSION	<b>Date : 02/01/2015, Time : 1200 Hrs (IST)</b> <b>Place : Tender Box, Room no. 108, First Floor, BHEL-PSNR-Noida</b>	Applicable
vi	OPENING OF TENDER	<b>Date : 02/01/2015, Time : 1530 Hrs (IST)</b>	Applicable

		Notes: (1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day. (2) Bidder may depute representative to witness the opening of tender	
vii	<b>EMD AMOUNT</b>	Rs 2,00,000/-	Applicable
viii	<b>COST OF TENDER</b>	Rs 2000/-.	Applicable
ix	<b>LAST DATE FOR SEEKING CLARIFICATION</b>	Date: <b>23/12/2014</b> Along with soft version also, addressing to undersigned & to others as per contact address given below	Applicable
x	<b>SCHEDULE OF Pre Bid Discussion (PBD)</b>		Not applicable.
xi	<b>INTEGRITY PACT &amp; DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)</b>		Not Applicable
xii	<b>Latest updates</b>	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) <b>and not in the newspapers</b> . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**
- 3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Noida issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Noida, Sundays and second/ last Saturdays
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida. For other details and for 'One Time EMD' please refer General Conditions of Contract.
- 5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:
- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
  - PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
  - One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below.

**(All pages to be signed and stamped)**

Sl no	Description	Remarks
<b>Part-I A</b>		
	<p><b>ENVELOPE – I superscribed as :</b>            PART-I (TECHNO COMMERCIAL BID)            TENDER NO :            NAME OF WORK :            PROJECT:            DUE DATE OF SUBMISSION:</p> <p><b>CONTAINING THE FOLLOWING:-</b></p>	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	<p>Duly filled-in 'No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.</p> <p><b>Note:</b></p> <p>a. In case of any deviation, the same should be submitted separately for technical &amp; commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained.</p> <p>b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding.</p> <p>i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL</p> <p>ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender</p>	
iii.	<p>Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria.</p> <p>It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.</p>	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : <u>Technical</u> Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

<b>PART-I B</b>		
	<p><b>ENVELOPE – II superscribed as:</b>            PART-I (EMD/COST of TENDER)            TENDER NO :            NAME OF WORK :</p>	

	PROJECT: DUE DATE OF SUBMISSION:	
	<b>CONTAINING THE FOLLOWING:-</b>	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender <b>OR</b> Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender  2. Cost of Tender ( Demand Draft or copy of Cash Receipt as the case may be)	

	<b>PART-II</b>	
	<b>PRICE BID</b> consisting of the following shall be enclosed	
	<b>ENVELOPE-III</b> superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:	
	<b>CONTAINING THE FOLLOWING</b>	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume II – PRICE BID ( Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	<b>OUTER COVER</b>	
	<b>ENVELOPE-IV</b> (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION:	
	<b>CONTAINING THE FOLLOWING:</b>	
i	<ul style="list-style-type: none"> <li>○ Envelopes I</li> <li>○ Envelopes II</li> <li>○ Envelopes III</li> </ul>	

**SPECIAL NOTE:** All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

**9.0 Assessment of Capacity of Bidder:** Bidders capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:

- I. **LOAD:** Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

- i). Total number of Packages  
 Total number of Packages in hand = P  
 Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

- II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (**under execution/** executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, for all the unit wise identified packages (refer Table I)

- i). Calculation of Overall 'Performance Rating' for 'similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':  
 This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

- $P_1, P_2, P_3, P_4, P_5, \dots, P_N$  etc be the packages (**under execution/** executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions =  $P_T$  (ie  $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$ )
- Number of Months ' $T_1$ ' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package  $P_1$ . Similarly  $T_2$  for package  $P_2$ ,  $T_3$  for package  $P_3$ , etc for the tendered scope. Now calculate cumulative total months ' $T_T$ ' for total similar Packages ' $P_T$ ' for all Regions (ie  $T_T = T_1 + T_2 + T_3 + T_4 + \dots + T_N$ )
- Sum ' $S_1$ ' of 'Monthly Performance Evaluation' Scores ( $S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, S_{1-5}, \dots, S_{1-N}$ ) for similar package  $P_1$ , for the 'period of assessment' ' $T_1$ ' (ie  $S_1 = S_{1-1} + S_{1-2} + S_{1-3} + S_{1-4} + S_{1-5} + \dots + S_{1-N}$ ). Similarly  $S_2$  for package  $P_2$  for period  $T_2$ ,  $S_3$  for package  $P_3$  for period  $T_3$ , etc for the tendered scope for all Regions. Now calculate cumulative sum ' $S_T$ ' of 'Monthly Performance Evaluation' Scores for total similar Packages ' $P_T$ ' for all Regions (ie ' $S_T = S_1 + S_2 + S_3 + S_4 + S_5 + \dots + S_N$ ')

- d) **Overall Performance Rating ' $R_{BHEL}$ ' for the similar Package/Packages (under execution/** executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL:

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{Aggregate of months for each of the similar package for which performance should have been evaluated in all the Regions}}$$

$$= \frac{S_T}{T_T}$$

e) Bidders to note that the risk of non-evaluation or non-availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder

f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl no	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	...	P <sub>N</sub>	Total No of similar packages for all Regions = P <sub>T</sub> ie Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment for corresponding similar Package (as in row 1)	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	...	T <sub>N</sub>	Sum (Σ) of columns (iii) to (ix)  = T <sub>T</sub>
3	Monthly performance scores for the corresponding period (as in Row 2)	S <sub>1-1</sub> , S <sub>1-2</sub> , S <sub>1-3</sub> , S <sub>1-4</sub> , ... S <sub>1-T1</sub>	S <sub>2-1</sub> , S <sub>2-2</sub> , S <sub>2-3</sub> , S <sub>2-4</sub> , ... S <sub>2-T2</sub>	S <sub>3-1</sub> , S <sub>3-2</sub> , S <sub>3-3</sub> , S <sub>3-4</sub> , ... S <sub>3-T3</sub>	S <sub>4-1</sub> , S <sub>4-2</sub> , S <sub>4-3</sub> , S <sub>4-4</sub> , ... S <sub>4-T4</sub>	S <sub>5-1</sub> , S <sub>5-2</sub> , S <sub>5-3</sub> , S <sub>5-4</sub> , ... S <sub>5-T5</sub>	.. ... ...	S <sub>N-1</sub> , S <sub>N-2</sub> , S <sub>N-3</sub> , S <sub>N-4</sub> , ... S <sub>N-TN</sub>	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	...	S <sub>N</sub>	Sum (Σ) of columns (iii) to (ix)  = S <sub>T</sub>

ii) Calculation of Overall 'Performance Rating' (R<sub>BHEL</sub>) in case 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. 'R<sub>BHEL</sub>' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

- Period of Assessment.
- 12 months preceding the cut-off month
- 24 months preceding the cut-off month
- 36 months preceding the cut-off month

In case, R<sub>BHEL</sub> cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'

iii) Factor "L" assigned based on Overall Performance Rating (R<sub>BHEL</sub>) at Power Sector Regions.:

Sl no	Overall Performance Rating (R <sub>BHEL</sub> )	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.4

3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

### III. 'Assessment of Capacity of Bidder':

'Assessment of Capacity of Bidder' is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages  $P_{Max} = (R_{BHEL} - 60)$  divided by corresponding value of 'L'  
i.e.  $(R_{BHEL} - 60)/L$

Note:

- In case the value of  $P_{Max}$  results in a fraction, the value of  $P_{Max}$  is to be rounded off to next whole number
- For  $R_{BHEL} = 60$ ,  $P_{Max} = '1'$
- For  $R_{BHEL} \geq 80$ , there will be no upper limit on  $P_{Max}$

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if  $P \leq P_{Max}$   
(where P is calculated as per clause 9.1)

### IV. Explanatory note:

- Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, etc at the individual level irrespective of rating of Plant, and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, CI, Civil, Structure, etc is considered individual level of package. For example in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e the 'identified packages as per Table-1 below), the 'PERFORMANCE' part against sl no II above, needs to be evaluated considering all the identified packages (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above
- Identified Packages (Unit wise)

**Table-1**

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

- Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI from BHEL.

The "FIRST TIMER" tag shall remain till execution of work for a period of not less than 09 months, from the commencement of work of first package

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Capacity Evaluation of Bidders'.

- d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating 'R<sub>BHEL</sub>'** only, starting from the upper band.
- e) 'Under execution' shall mean works in progress as per the following:
- i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries
  - ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)
  - iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

Note : BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (i), (ii) and (iii) above, depending upon the balance scope of work to be completed.

- f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by

BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall be deemed to be in compliance with tender including PBD.
- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**
- 16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.
- 17.0 In case BHEL decides on a 'Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.
- 18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.
- 19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .
- However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- 20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.
- 21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.
- 22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 23.0 **Not Used**
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of **banned firms** is available on BHEL web site [www.bhel.com](http://www.bhel.com).
- 27.0 BHEL reserves the right to go for **Reverse Auction (RA)** instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their

acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid“ in the Reverse Auction. Non-submission of „online sealed bid“ by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.”

Information and General Terms and Conditions governing RA shall form part of the RFQ/ Enquiry.

28.0 It may please be noted that **guidelines/rules** in respect of Suspension of Business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', etc may **undergo change** from time to time and the latest one shall be followed.

29.0 **Micro and Small Enterprises (MSE)**

Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer

Type under MSE	SC/ST owned	Others
Micro		
Small		

**Note:** - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3 where deemed validity of EM-II certificate of five years has expired) applicable for the relevant financial year (last audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer.

30.0 Order of Precedence

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

- a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
- b. Notice Inviting Tender (NIT)
- c. Price Bid
- d. Technical Conditions of Contract (TCC)—Volume-1A
- e. Special Conditions of Contract (SCC) —Volume-1B
- f. General Conditions of Contract (GCC) —Volume-1C
- g. Forms and Procedures —Volume-1D

for BHARAT HEAVY ELECTRICALS LTD  
(SCT)

**Enclosure**

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List.
03. Annexure-3: Chartered Accountant certificate for MSMED
04. Other Tender documents as per this NIT.

**PRE QUALIFYING REQUIREMENTS****ANNEXURE – 1**

JOB	<b>Excavation work of Hard Rock – Requiring Blasting by Mechanical Means (Hydraulic Excavator/Manual Means) of Pits for Tree Plantation at 2 X 700 MW, RAPP 7 &amp; 8 OF NPCIL.</b>
TENDER NO.	<b>BHEL/NR/SCT/RAPP KOTA/EXCAVATION/983</b>

SL. NO.	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no. of supporting document
A	<b>Submission of Integrity Pact duly signed</b>	Not Applicable	
B	<p><b><u>Technical</u></b></p> <p>1.0 Tenderer who wish to participate should have executed during the last seven years, ending last day of month previous to one in which applications are invited, work of similar nature covered in this tender, as per following:</p> <p>1.1 One single work of similar nature in power plant/ industrial unit valuing Rs. 219.2 Lacs or above.</p> <p style="text-align: center;">‘OR’</p> <p>1.2 Two works of similar nature in power plant/ industrial unit valuing each Rs. 137 Lacs or above.</p> <p style="text-align: center;">‘OR’</p> <p>1.3 Three works of similar nature in power plant/ industrial unit valuing each Rs.109.6 Lacs or above.</p>	Applicable	
C-1	<p><b><u>Financial TURNOVER</u></b></p> <p>Bidders should have achieved an average annual financial turnover (Audited) of Rs 82.2 Lakhs or more over last three Financial Years (FY) i.e 2011-12, 2012-13 &amp; 2013-14.</p>	Applicable	
C-2	<p><b><u>NETWORTH (only in case of Companies)</u></b></p> <p>Net worth of the Bidder based on the latest Audited Accounts as furnished for ‘C-1’ above should be positive.</p>	Applicable	

C-3	<b><u>PROFIT</u></b> Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C-1' above based on latest Audited Accounts.	<b>Applicable</b>	
D	<b>Assessment of Capacity of Bidder to execute the work as per sl. no. 9 of NIT</b>	<b>Not Applicable</b>	
E	<b>Approval of Customer</b>	<b>Not Applicable</b>	
F	<b>Consortium criteria</b>	<b>Not Applicable</b>	

**Explanatory Notes for QR 'B'**

1. For B-1.1, B-1.2 and B-1.3 the word 'executed' means the bidder should have achieved the criteria specified in the QR even if the total contract has not been completed or closed.
2. For B-1.1, B-1.2 and B-1.3 value of work is to be updated as per the PVC formula of GCC with indices for "All India Avg. Consumer Price Index for Industrial Workers" (i.e. 'K' in this case shall be 80%) with base month as date of execution (completion of contract/ work) and indexed upto two months prior to bid opening months. This condition will be applicable only for the completed jobs and not for the jobs in progress as on date of technical bid opening.
3. If the qualifying work is completed in the Seven (7) years period specified above, even if it has been started earlier, the same will also be considered meeting the qualifying requirements.
4. 'Similar' work means – Enabling or piling or civil work or civil and structure or chimney work or blasting work.
5. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexure.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

**ANNEXURE - 2****CHECK LIST****NOTE:- Tenderers are required to fill in the following details and no column should be left blank**

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No:                      Date : Bank :                      Amount: Please tick ( <input type="checkbox"/> ) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with <b>PRE QUALIFICATION CRITERIA</b> (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/Not Applicable	YES/NO
8	Copy of PAN Card	Applicable/Not Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/Not Applicable	YES/NO
10	Integrity Pact	Applicable/Not Applicable	YES/NO
11	Declaration by Authorised Signatory	Applicable/Not Applicable	YES/NO
12	No Deviation Certificate	Applicable/Not Applicable	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/Not Applicable	YES/NO
14	Declaration for relation in BHEL	Applicable/Not Applicable	YES/NO
15	Non Disclosure Certificate	Applicable/Not Applicable	YES/NO
16	Bank Account Details for E-Payment	Applicable/Not Applicable	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/Not Applicable	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	Applicable/Not Applicable	YES/NO

19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/ <del>Not Applicable</del>	YES/ <del>NO</del>
20	Analysis of Unit rates	Applicable/ <del>Not Applicable</del>	YES/ <del>NO</del>

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

**AUTHORISED SIGNATORY**  
(With Name, Designation and Company seal)

**ANNEXURE - 3****Certificate by Chartered Accountant on letter head**

This is to Certify that M/S ..... ,  
 (hereinafter referred to as 'company') having its registered office at  
 ..... is registered under MSMED Act 2006, (Entrepreneur  
 Memorandum No (Part—II) ..... dtd:..... ,  
 Category: ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per  
 the latest audited financial year..... as per MSMED Act 2006 is as follows:

**1. For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost  
 excluding land and building and the items specified by the Ministry of Small Scale Industries vide  
 its notification No. S.O.1722(E) dated October 5, 2006:  
 Rs.....Lacs

**2. For Service Enterprises:** Investment in equipment (original cost excluding land and building  
 and furniture, fittings and other items not directly related to the service rendered or as may be notified  
 under the **MSMED** Act, 2006:  
 Rs.....Lacs

**(Strike off which is not applicable)**

The above investment of Rs.....Lacs is within permissible limit of  
 Rs.....Lacs for ..... Micro / Small **(Strike off which is not applicable)**

Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off which is not  
 applicable) and the date of graduation of such enterprise from its original category is .....  
 (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from  
 its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette  
 notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

**ANNEXURE - 4****GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)**

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit "online sealed bid" in the Reverse Auction. Non submission of "online sealed bid" by the bidder for any of the eligible items for which techno commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL"s standard practice.
12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the

„Business Rules of Reverse Auction“, which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1(s) bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

**ANNEXURE – 5****Authorization of representative who will participate in the on line Reverse Auction Process;**

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

**ANNEXURE – 6****Feedback Form: From where did you get information reg. this tender**

1	NEWSPAPER ADVERTISEMENT (NAME OF NEWSPAPER)	
2	BHEL WEBISTE (TENDER NOTIFICATION) ( <a href="http://www.bhel.com">www.bhel.com</a> )	
3	CENTRAL PUBLIC PROCUREMENT PORTAL OF GOVERNMENT OF INDIA (CPP PORTAL) ( <a href="http://www.eprocure.gov.in">www.eprocure.gov.in</a> )	
4	EMAIL COMMUNICATION FROM BHEL	
5	ANY OTHER SOURCE (GIVE DETAILS)	



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

(EXCAVATION WORK OF HARD ROCK  
AT RAPP KOTA)

BHARAT HEAVY ELECTRICALS LIMITED



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

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## “TECHNICAL CONDITIONS OF CONTRACT (TCC)”

OF

**“EXCAVATION WORK IN HARD ROCK –REQUIRING BLASTING BY MECHANICAL MEANS (HYDRAULIC EXCAVATOR/MANUAL MEANS) OF PITS FOR TREE PLANTATION”**

AT

**2 X 700 MW, RAPP 7 & 8 NUCLEAR POWER CORPORATION OF INDIA LTD (NPCIL)**



**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northren Region,**  
**Plot No. 25 , Sector - 16A ,**  
**Distt. GautamBudh Nagar, NOIDA – 201 301 (INDIA)**

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

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<b>SI No</b>	<b>DESCRIPTION</b>	<b>Chapter</b>	<b>PAGE NO.</b>
	<b>Contract specific details</b>		
1	Project Information	Chapter-I	4-4
2	Scope of Works	Chapter-II	5-8
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11	Annexures	Chapter-XI	35-36
12	Unpriced Rate Schedule	Chapter-XII	37-39

**Chapter I: Project Information**

**PROJECT SYNOPSIS**

<b>Name of Customer/Owner</b>	<b>: NUCLEAR POWER CORPORATION OF INDIA LTD. (NPCIL)</b>
Address	: NPCIL RAPP 7 & 8, Tehsil – Rawatbhata, District– CHITTOORGARH, Rajasthan
Unit	: 2 x 700 MW
Nearest Railway station	: 70Km from Kota Railway Station
Nearest Road	: 13Km from Rawatbhata
Nearest City	: KOTA
Nearest Airport	: Jaipur- 300Km
Highest Temperature	: 49 deg C
Lowest Temperature	: 6 deg C

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## **Chapter II : Scope of work**

### **GENERAL SCOPE OF WORK**

#### **2.1 BRIEF OF WORK COVERED UNDER SCOPE:**

<b>2.1.1</b>	Making of earth pits of size 1mtrs X 1mtrs X 1mtrs. Center to center distance of pits will be approx. 3mtrs. The excavation shall be done manually and by mechanical means as directed by BHEL Engineer.
<b>2.1.2</b>	This scope of work includes arranging of all necessary tool for manual excavation & blasting. Arrangement of explosives and all other instruments required for blasting will be in the scope of contractor.
<b>2.1.3</b>	For hard rock blasting operations are necessary. The contractor shall obtain approval of BHEL Engineer in writing for excavation in hard rock by blasting operation.
<b>2.1.4</b>	Excavation shall include carting, leveling and disposing the excavated materials within the specified lead.
<b>2.1.5</b>	The excavation of pits shall be carried out systematically. Cutting shall be done from top to bottom and no under-pining or undercutting will be allowed. The bottom and sides of excavation shall be dressed to proper level, slopes, steps, camber etc. by removing high spots, and ramming thoroughly as directed by the BHEL Engineer.
<b>2.1.6</b>	Scope of work includes obtaining license from the competent authority for undertaking blasting work as well as for obtaining and storing the explosive as per the Explosive Act, 1884 as amended up to date and the Explosive Rules, 1983.
<b>2.1.7</b>	The scope includes responsible for the safe transportation, storage and custody as per explosive rules and proper accounting of the explosive materials. Fuses and detonators shall be stored separately and away from the explosives.
<b>2.1.8</b>	In case of excavation of pit done deeper by the contractor. It shall be brought to the required level by the contractor at his own cost by filling with earth duly watered, consolidated and rammed.
<b>2.1.9</b>	Blasting shall be executed through an agent of contractor with prior permission from police authorities.
<b>2.1.10</b>	In case, blasting is not permitted. Excavation shall be done by chiseling and wedging or any other agreed method.
<b>2.1.11</b>	Any activity which is necessarily required for satisfactory execution of any item of BOQ in line with specifications shall be deemed to be included in BOQ item even if it is not described in the item description and no extra payment shall be made against such activity.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

<b>2.1.12</b>	The work under this contract shall be carried out as per BOQ Cum Rate Schedule. In case the description / specifications as per BOQ are found to be incomplete, Indian standard specifications shall be followed. Quantities mentioned in the BOQ cum rate schedules are approximate only and liable for variation due to change of scope of work / variation in schedule of quantities, changes in design etc. The tenderers shall undertake to execute actual quantities as per advice of BHEL BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same. The quantities indicated against each item may vary to any extent and no compensation will be payable in variation of Individual quantity.
<b>2.1.13</b>	The complete works shall be carried out as per BOQ cum Rate schedule. If any work covered in the scope of contract cannot be executed using items available in BOQ, additional / extra items shall be made and rates for such items shall be worked out as per GCC clause 2.15.7. However contractor shall be bound to execute all the works under the scope of the contract and decision whether an extra item is applicable or not, shall be taken by BHEL BHEL Engineer which will be binding on the contractor.

### 2.2 DETAILED SCOPE OF WORK:

<b>2.2.1</b>	<b>INITIATION &amp; ROUTING OF WORK PERMIT FOR ROCK BLASTING</b>
2.2.1.1	BHEL and NPCIL shall initiate blasting work permit by filling the blasting work permit format (as per Annexure-2). Contractor shall depute a representative as a work permit holder for carrying out the rock blasting work. After ensuring the fulfilment of requirements as mentioned in work permit format, Contractor shall authorize the rock blasting work permit. After authorization of work permit, the permit format shall be forwarded to Safety Engineer for guidance regarding safety precautions to be taken while carrying out blasting work.
2.2.1.2	BHEL/ NPCIL Safety Engineer shall notify/explain the safety precautions, which are to be ensured by the Contractor before start of the work, during and after completion of the work.
2.2.1.3	Contractor shall confirm to and ensure all the precautions as described by Safety Engineer. After ensuring the safety precautions & responsibilities, permit shall be submitted to Safety Officer authorised by NPCIL.
2.2.1.4	Contractor shall perform proper survey and marking of the area prior to blasting operation. Sufficient water sprinkling shall be done to minimize the dust occurrence.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

<b>2.2.2</b>	<b>JOB HAZARDS ANALYSIS</b>
2.2.2.1	Contractor Engineer shall ensure the completion of the Job Hazards analysis of the work prior to initiating the work permit. According to the outcome of job hazard analysis safety precautions / corrective actions shall be taken by Contractor Engineer and the same shall be mentioned in the work permit.
<b>2.2.3</b>	<b>ENTRY OF EXPLOSIVES</b>
2.2.3.1	For blasting, suitable blasting material along with detonating fuses, relay and electric detonators as initiating accessories, shall be used. The explosive shall be transported through magazine van to the work site, for day to day blasting. Blasting permits duly signed by valid license holder blasting foreman/ blaster shall be submitted to Security department for their permission to take this explosive inside the plant site.
<b>2.2.4</b>	<b>LOADING OF EXPLOSIVES</b>
2.2.4.1	The explosives shall be loaded in presence of the representatives of Contractor and Safety Officer authorised by NPCIL. Work permit holder shall ensure the shutdown of electrical installation (if required) before loading of the explosives. After loading operation, entire area shall be evacuated 15 minutes prior to blasting by blowing supervisor.
<b>2.2.5</b>	<b>CARRY OUT THE BLASTING PROCESS</b>
2.2.5.1	Valid License holder blasting foreman/ blaster shall be engaged for execution of blasting. Prior to any blasting operation, permission shall be taken from NPCIL. Blasting operation is to be carried out at mutually agreed time as approved during procedure approval. Vibration monitoring meter shall be installed for monitoring of vibration at the nearby location as per site requirements. Communication will be done through a notice to all agencies to proceed in safe manner.
2.2.5.2	A blasting coordinator shall be deputed by contractor for coordinating blasting work.
2.2.5.3	Blasting Coordinator shall have white, green and red flag with him along with a whistle.
2.2.5.4	After loading of the explosives by the agency, blasting coordinator shall ensure restriction on entry of vehicles/ persons at all entry points, with the help of the persons with red flag and whistle.
<b>2.2.6</b>	<b>POST- BLASTING ACTIVITIES</b>
2.2.6.1	The number of unused explosives, detonators and safety fuses shall be recorded in the prescribed form (Annexure-1). All unused explosives, detonators and safety fuses shall be taken back to the magazine. The permit holder, & Security shall certify the safe completion of the blasting in the prescribed form (Annexure-1).

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

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<b>2.2.7</b>	<b>BLASTING PROCEDURE</b>
2.2.7.1	A detailed blasting procedure shall be prepared by the contractor. Blasting Operation to be executed as per approved procedure for blasting, approved by BHEL/NPCIL and initiated by contractor.
<b>2.2.8</b>	<b>STORAGE OF EXPLOSIVE</b>
2.2.8.1	Storage of Explosives shall be carried out as per IS Code 4081
<b>2.2.9</b>	<b>Health of Workers deployed:</b> Contractor shall make necessary arrangements to ensure following:
2.2.9.1	Contractor has to ensure pre-employment medical check for all staff & workers and need to submit the medical fitness certificate as may be required by BHEL/ BHEL Customer. The designated hospital/ medical dispensary (if any) shall be informed well in advance.
2.2.9.2	Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra-modern medical facilities required during emergency.
2.2.9.3	Contractor has to ensure that adequate First Aid facilities are available at work site for emergency purpose
2.2.9.4	In addition to above, BHEL (through its other contractor) would arrange ambulance at work site for emergency purpose, which can be utilized by the contractor in case of emergency. The charges for the same will be decided mutually at site. In case, under unavoidable circumstances, if the ambulance is not available / being used elsewhere, the contractor will have to arrange for the same.
2.2.9.5	Contractor shall ensure daily housekeeping and keep proper cleanliness of work place and do the disposal of wastes to certified area.
2.2.9.6	In case of violation of any safety rules, suitable penalty as per BHEL/NPCIL rates will be imposed on the contractor.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### Chapter III: FACILITIES IN THE SCOPE OF BHEL/CONTRACTOR

<b>3.0</b>	<b>FACILITIES IN THE SCOPE OF BHEL/CONTRACTOR</b>
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S. No.	Description	Scope /to be taken care by		Remarks
		BHEL	Contractor	
<b>3.1</b>	<b>ESTABLISHMENT</b>			
<b>3.1.1</b>	<b>FOR CONSTRUCTION PURPOSE</b>			
3.1.1.1	Open space for office	<b>YES</b>		Limited space as and whereas basis made available by customer M/s NPCIL
3.1.1.2	Open space for storage	<b>YES</b>		Limited space as and whereas basis made available by customer M/s NPCIL
<b>3.1.2</b>	<b>FOR LABOUR COLONY</b>			
3.1.2.1	Open space		<b>YES</b>	Contractor has to make their own arrangement.
<b>3.2</b>	<b>ELECTRICITY</b>			
3.2.1.	Electricity for construction purposes (chargeable)			
3.2.1.1	Single point source	<b>YES</b>		CHARGABLE-(As per prevailing rate. Present charges are Rs. 4.74 per kWh.)
3.2.1.2	Further distribution for the work to be done which include supply of materials & execution		<b>YES</b>	
3.2.2	Electricity for the Contractor`s office, their canteen etc. which include		<b>YES</b>	
3.2.2.1	Distribution from single point including supply of materials & service		<b>YES</b>	
3.2.2.2	Supply, Installation & connection of material of energy meter including operation & maintenance		<b>YES</b>	

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

3.2.2.3	Duties & deposits including statutory clearances for above		<b>YES</b>	
3.2.2.4	Demobilization of the facilities after completion of works		<b>YES</b>	
3.2.2.5	Electricity for living accommodation of the bidder's Staff, engineers, supervisors etc. on the above Lines		<b>YES</b>	<b>Chargeable</b> As per prevailing rates Contractor shall install calibrated energy meter for metering electricity consumption.
<b>3.3</b>	<b>WATER SUPPLY</b>			
<b>3.3.1</b>	<b>FOR CONSTRUCTION</b>			
3.3.1.1	Making the water available at single point		<b>YES</b>	Contractor has to arrange on his own.
3.3.1.2	Further distribution as per the requirement of work including supply of materials & execution		<b>YES</b>	
<b>3.3.2</b>	<b>FOR LABOUR COLONY</b>			
3.3.2.1	Making the water available at single point		YES	Contractor has to arrange on his own.
3.3.2.2	Further distribution as per the requirement of work including supply of materials & execution		YES	
<b>3.4</b>	<b>LIGHTING</b>			Refer 3.6 to 3.12
3.4.1	For Material Handling work (supply of all materials) 1. At office storage area 2. At Yard or any other places where material is unloaded/stored		<b>YES</b>	
3.4.2	For material handling work (execution of lighting work/arrangements) 1. At office storage area 2. At Yard or any other places where material is unloaded/stored		<b>YES</b>	

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

3.4.3	Providing the necessary consumables like bulbs, tube lights, Switches, etc. for maintaining the lighting system		<b>YES</b>	
<b>3.5.</b>	<b>Communications facilities for site operations of the bidder</b>			Shall be for contractor`s own use only.
3.5.1	Telephone/mobile, fax, internet, email etc.		<b>YES</b>	

<b>3.6</b>	BHEL will not be responsible for any loss or damage to the contractor`s equipment as a result of variation in voltage or frequency or interruptions in power supply.
<b>3.7</b>	The Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. to their employees/ workers etc. at his own cost as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.
<b>3.8</b>	Provision of distribution lines of both electrical power from the central points to the required place with proper distribution boards observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS/ Copper / Brass clamps, copper conductor, change over switches pipes etc. at his own cost. If any failure is caused in supply of the power, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shifts / hours accordingly and deploy additional manpower if necessary so as to achieve the targets. <b>The energy meter to be installed by the contractor &amp; shall be tested and certified by State Electricity Board or any other agency approved by the NPCIL at contractor`s cost.</b>
<b>3.9</b>	The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points:
3.9.1	All electrical installations should be as per Indian Electricity rules.
3.9.2	All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.
3.9.3	Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.
3.9.4	All electrical connections should be made through connectors, nuts and bolts, switches, plug and sockets. Loose connections or hooking up of wires shall not be permitted.
3.9.5	Contractor has to make their own earthing arrangement for their equipment / DB

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	earthing.
3.9.6	All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
3.9.7	Contractor should use "MCCB" and "ELCB" either on incoming or outgoing connections to the DBs.
3.9.8	Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.
3.9.9	For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.
<b>3.10</b>	ELCB will be tested once in a week or as directed by BHEL by actually simulating the earth leakage for all installations and the same shall be recorded in the logbook to be maintained by the contractor.
<b>3.11</b>	In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.
<b>3.12</b>	On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and leveled and debris shall be removed, as per instructions of BHEL, by the contractor at his cost. In the event of his failure to do so, the Engineer will get it done and expenses incurred shall be recovered from the contractor along with prevailing overheads. The decision of BHEL Engineer in this regard shall be final.

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## **Chapter IV: T&P TO BE DEPLOYED BY CONTRACTOR**

<b>4.0</b>	<b>T&amp;P TO BE DEPLOYED BY CONTRACTOR</b>
4.0.1	All the necessary tools & tackles required for executing of said work will be arranged by the contractor.
4.0.2	All explosives and other consumables etc will also be arranged by the contractor.
4.0.3	An indicative list of T&P's required for this work to be deployed by the contractor is as under- <ul style="list-style-type: none"><li>• Compressor- Output of 5.6 to 7.0 cum/min at a pressure of 6kg/cm<sup>2</sup> approx.</li><li>• Jack hammer</li><li>• Excavator</li><li>• Magazine van with 10MT capacity and portable magazine</li><li>• Theodolite/ total station</li><li>• Water sprinkler</li><li>• Siren</li><li>• PPV meter &amp;</li><li>• Seismograph</li></ul>
4.0.4	Contractor shall submit the month wise T&P deployment plan to BHEL and will take approval of BHEL engineer for ensuring timely completion of job.
4.0.5	The above list is only indicative and these T&Ps may not be required for entire contract period but contractor will ensure that these T & Ps are provided as per need. Contractor will assess actual quantity and period of requirement based on his experience.
	Other terms and conditions regarding above items please also refer clause for T&P/IMTEs in SCC.
	All the tools and plants required for this scope of work are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. <b>Any additional T &amp; P required to meet BHEL commitments/schedule shall be arranged without any extra cost by the contractor.</b>

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## **Chapter V: T&P TO BE DEPLOYED BY BHEL**

<b>5.0</b>	<b>T&amp;P TO BE DEPLOYED BY BHEL</b>
<b>NOT APPLICABLE</b>	

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## **Chapter VI: TIME SCHEDULE**

<b>6.0</b>	<b>TIME SCHEDULE</b>
6.1	The contractor is required to commence the work within 15 days from the date of issue of letter of intent (LOI). However, the construction manager shall inform contractor regarding Actual / Zero date of start of work.
6.2.	Entire work as detailed in tender specification shall be completed within <b>12 (Twelve) months</b> from the actual date of start of work as per the programs / milestones indicated by BHEL. Contractor has to mobilize adequate resources to meet BHEL's commitments to their customer as indicated from time to time. <b>In the event the contractor fails to respond to these requirements, BHEL shall take appropriate actions to meet customer's commitments in line with the provisions of General Conditions of Contract.</b>
6.3	In case due to reasons not attributable to the contractor, the work gets delayed and scheduled completion gets extended, time extension will be granted by BHEL.
6.4	The work under the scope of this contract is deemed to be completed in all respects, only when all the works are carried out as per satisfaction of BHEL. The decision of BHEL on completion date shall be final and binding on the Contractor. In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL without any extra cost to BHEL.
6.5	It may be noted that in the event, delay in completion is attributable to the contractor; BHEL will impose LD on the contractor as per GCC.

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## **Chapter VII: TERMS OF PAYMENT**

<b>7.0</b>	<b>TERMS OF PAYMENT</b>
<b>TERMS OF PAYMENT: As per Chapter – X of SCC and clause nos. 2.22 &amp; 2.23 of GCC.</b>	

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## **Chapter VIII: TAXES & OTHER DUTIES**

<b>8.0</b>	<b>TAXES, DUTIES, LEVIES</b>
<p>The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods &amp; services consumed and output goods &amp; services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.</p> <p>However, provisions regarding <b>Service Tax and Value Added Tax (VAT)</b> on output services and goods shall be as per following clauses:</p>	

<b>8.1</b>	<b>SERVICE TAX &amp; CESS ON SERVICE TAX</b>
<p>Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be <b>exclusive</b> of Service Tax and Cess on Output Services.</p> <p>Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. The Service Tax Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract.</p> <p>For the purpose of claiming Service Tax from BHEL, the following procedure shall be adopted :</p> <p>Contractor shall submit serially numbered Service Tax and Cess Invoices, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely:</p> <p>The name, address and registration number of the contractor</p> <p>The name and address of the party receiving taxable service (BHEL)</p> <p>Description, classification and value of taxable service provided and</p> <p>The Service Tax payable thereon.</p>	

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All the four conditions shall be fulfilled in the invoice for payment of Service Tax by BHEL. Where more than one nature of Service under Service Tax Rules is involved, the invoice mentioned above shall contain the break up of all values for each nature of Service.

Name & address of the contractor should be same in the service tax invoice & monthly bill. Any change in the name & address in past should be supported by documentary evidence duly Certified by registering authority.

Purpose of above requirements, inter alia, is to enable availment of CENVAT credit by BHEL. As per recent amendment time restrictions for taking cenvat credit is within Six months from date of invoice. Wherever CENVAT credit could not be availed by BHEL within statutory time limit of 6 months due to delay in submission of invoice or for any other reason attributable to contractors, liability towards loss of such CENVAT credit shall be passed on to contractors.

### 8.2 VAT (SALES TAX /WCT)

#### **Civil Works:**

As regards Value Added Tax (VAT) on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be **exclusive** of the same. Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. In case contractor opts for composition, it will be with the prior express consent of BHEL. The VAT Rules permit more than one option or methodology for discharging the liability of tax/levy/duty and BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. BHEL also reserves the right to demand "Tax Invoice" under the relevant VAT Act, from the Contractor. Where such taxes are required to be paid by the contractor subject to the above, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only.

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### **Works other than Civil Works:**

The rates quoted by the Contractor shall be inclusive of VAT/Sales Tax and BHEL shall not reimburse any amount on this account due to any reason whatsoever.

### **Common to all Works (Both Civil and Other than Civil):**

The Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill.

Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

Contractor has to make his own arrangement at his cost for completing the formalities, if required, with Sales Tax/VAT Authorities, for bringing all their material, plant and equipment etc at site for the execution of the work, including arrangement of Road Permits if and as applicable under the relevant VAT Act.

### **8.3 MODALITIES OF TAX INCIDENCE ON BHEL**

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

### **8.4 New Taxes/Levies**

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer. No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

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## **Chapter IX: OTHER REQUIREMENTS**

<b>9.0</b>	<b>OTHER REQUIREMENTS</b>
<b>9.1</b>	<b>The contractor shall comply with following towards Social Accountability;</b>
9.1	<ul style="list-style-type: none"><li><b>(a)</b> The contractor shall not employ any employee less than 15 years of age in pursuant to ILO convention. If any child labour were found to have been engaged , the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure.</li><li><b>(b)</b> The contractor shall not engage Forced / Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976.</li><li><b>(c)</b> The contractor shall maintain Health &amp; safety requirement as stipulated in the Contract and Contract Labour (Regulation &amp; Abolition) Act, 1970.</li><li><b>(d)</b> The Contractor shall abide by UN convention w.r.t Human Rights and shall be liable for Discrimination/Corporal punishment for failure in meeting with relevant requirements.</li><li><b>(e)</b> The Contractor shall abide the requirement of Contract Labour (Regulation &amp; Abolition) Act, 1970 for working hours.</li><li><b>(f)</b> The Contractor shall abide by the statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936.</li><li><b>(g)</b> The Contractor shall arrange potable drinking water to its employees &amp; workers.</li></ul>
<b>9.2</b>	<b>INSTRUCTIONS TO TENDERERS</b>
9.2.1	<p>The Tenderer are advised to physically visit the site and fully acquaint themselves with site conditions, transportation routes, various distances and the fact that other contractors would be working in this area and their structures are to be protected. The material brought and stacked for construction should not make hindrance to other contractors. Necessary precaution and arrangements including sprinkling of water during work as acceptable to BHEL for safety &amp; security for the above have to be made by the contractor. No claim will be entertained by BHEL on ground of lack of knowledge and the contractor's rates shall be deemed to have taken this into account.</p> <p>The contractor, in the event of this work awarded to him, shall establish an office at site and keep posted an authorized, responsible officer with valid</p>

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	Power of Attorney for the purpose of the contract. Any order or instructions of the `Engineer' or his duly authorized representative, communicated to the contractor's representative at site office will be deemed to have been communicated to the contractor at his legal address.
9.3	<b>MATERIALS :</b>
9.3.1	The contractor shall at his own expenses provide all materials including paints, welding electrodes etc. required for the work
9.3.2	All materials to be provided by the Contractor shall be of the best kind in conformity with the specifications laid down in the contract or as per relevant Indian standard and the Contractor shall, if requested by the Engineer, furnish proof to the satisfaction of Engineer that the materials so comply.
9.3.3	The Contractor shall indemnify BHEL, its representatives or employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the Contract. In the event of any claim being made or action being brought against BHEL or any agent, servant or employee of BHEL in respect of any such matters as aforesaid, the Contractor shall immediately be notified thereof, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by BHEL but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid will be reimbursed to the Contractor only if the use was the result of any drawings and / or specifications issued after submission of the tender.
9.3.4	Material required for the works, whether brought by the Contractor or supplied by BHEL, shall be stored by the Contractor only at places approved by the Engineer. Storage and safe custody of material shall be the responsibility of the contractor.
9.3.5	BHEL's officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used in or on the works, either on the Site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place (s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.
9.3.6	All materials brought to the Site shall become and remain the property of BHEL and shall not be removed off the Site without the prior written approval of the Engineer. But whenever the Works are finally completed and advance,

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	if any, in respect of any such material is fully recovered, the Contractor shall at his own expense forthwith remove from the Site all surplus material originally supplied by him and upon such removal, the same shall re-vest in and become the property of the Contractor.
<b>9.4</b>	<b>EXECUTION OF WORK</b>
9.4.1	The work shall be executed in a workman like manner and to the entire satisfaction of the Engineer and as per technical specification issued with tender, IS codes, CPWD specifications as applicable. In case of conflict, the decision of the Engineer shall be final & binding
9.4.2	The Engineer will communicate or confirm his instructions to the Contractor in respect of the execution of the work in a "Work Site Order Book" maintained at his office and the Contractor shall visit this office daily and shall confirm receipt of such instructions by signing the relevant entries in this book. Such entries will rank as order or notices in writing within the intent and meaning of these conditions
<b>9.5</b>	<b>SETTING OUT</b>
9.5.1	All the works shall be set out to the true lines, grades and elevation indicated on the drawing. The contractor shall be responsible to locate and set out the works. Only one grid reference line and bench mark all be made available for setting out the works under the contract. This reference lines shall be used as datum for the works under the contract and the contractor has to establish for his work area at available points horizontal and vertical control points. The contractor shall inform BHEL well in advance of the times & places at which he wishes to do work in the area allotted to him so that suitable datum points established by him are checked by BHEL / Customer to enable the contractor to proceed with the works. Any work done without being properly located may be removed and / or dismantled by BHEL / Customer at contractors expense.
9.5.2	The contractor shall at his own expense take all proper and responsible precautions to preserve and maintain these datum marks to its true position. In the event of these marks being disturbed or obliterated by accident or due to any other cause whatsoever, the same may be deemed necessary placed by BHEL / Customer at contractor's expenses.

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<b>9.6</b>	<b>SITE DRAINAGE</b>
9.6.1	All water including sub-soil water which may accumulate on the Site during the progress of the works or in trenches and excavations, including monsoon period shall be removed by the contractor from the Site to the satisfaction of the Engineer. It will also be responsibility of the contractor to de-water all the foundation pits, trenches with suitable de-watering methods like, pumping out, well point system etc. considering the depth of water table at plant site. All such expenditure on de-watering shall be deemed to be included in quoted rates.
<b>9.7</b>	<b>INSPECTION AND STAGE APPROVAL OF THE WORK</b>
9.7.1	The owner or his duly authorised representative shall have at all reasonable times access to the contractor's premises or works and shall have the power to inspect drawings or any portion of the work, examine the materials and workmanship and shall have the authority to reject any work. This would be implemented through joint inspection by the representative of the owner and BHEL and in the form of joint protocols without any extra claims and loss of time and amount.
9.7.2	All work embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice in writing to the Engineer when each stage is ready. In default of such notice being received, the Engineer shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the Engineer thereon shall be final and conclusive.
<b>9.8</b>	<b>UNCOVERING AND MAKING GOOD</b>
9.8.1	The Contractor shall uncover any part of the Works and/or make openings in or through the same as the Engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer. If any such part has been covered up or put out of view after being approved by the Engineer and is subsequently found on uncovering to be executed in accordance with the Contract, the expenses of uncovering and / or making opening in or through, reinstating and making good the same shall be borne by BHEL. In any other case all such expenses shall be borne by the Contractor.
<b>9.9</b>	<b>DISCREPANCIES AND ADJUSTMENT OF ERRORS</b>
9.9.1	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small-scale drawings and figures dimensions in preference to scale and special conditions in preference to general conditions.

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9.9.2	<p>In case of discrepancies between schedules of quantities, the specification and / or the drawings, the following order of preference shall be observed.</p> <ul style="list-style-type: none"> <li>(a) Description in schedule of quantities.</li> <li>(b) Technical Conditions of Contract</li> <li>(c) Drawings</li> <li>(d) Technical Specifications</li> <li>(e) Special Conditions of Contract</li> <li>(f) General conditions of contract</li> </ul> <p>If there are varying or conflicting provisions made in any one document forming part of the contract, the Engineer shall be the deciding authority with regard to the document.</p>
9.9.3	<p>Any error in description, quantity in schedule of quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to the drawings and specifications or from any of his obligations under the contract.</p>
9.9.4	<p>If on check there are found to be differences between the rates given by the contractor in words and figures or in the amount worked out by him in the schedule of quantities and general summary, the same shall be adjusted in accordance with the following rules:</p> <ul style="list-style-type: none"> <li>(a) In the event of discrepancies between description in words and figures quoted by a tenderer, the lesser of the two will be treated as valid rate.</li> <li>(b) In the event of an error occurring in the amount column of schedule of quantities as a result of wrong extension of the unit rate and quantity, the unit rate shall be regarded as firm and extension shall be amended on the basis of the rate.</li> <li>(c) All errors in totaling in the amount column and in carrying forward totals shall be corrected.</li> <li>(d) The totals of various sections of bill of quantities amended shall be carried over to the general summary and the tendered sum amended accordingly. The tendered sum so altered shall, for the purpose of tender, be substituted for the sum originally tendered and considered for acceptance instead of the original sum quoted by the tenderer. Any rounding of quantities or in sections of bill of quantities or in general summary, by the tenderer, shall be ignored.</li> </ul>
9.9.5	<p>If neither drawing nor specification contain any mention of minor details of construction which in the opinion of the Engineer whose decision shall be final and conclusive, are reasonable and obviously and fairly intended for satisfactory completion of work, such details shall be provided by the contractor without any extra cost, as if they were specially mentioned and shall be deemed to be included.</p>

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<b>9.10</b>	<b>MATERIAL OBTAINED FROM EXCAVATION</b>
9.10.1	Valuable Materials / Archeologically important materials of any kind obtained from excavation on the Site shall remain the property of BHEL / its client and shall be disposed of as the Engineer may direct, at no extra cost.
<b>9.11</b>	<b>SAFETY CODE: The contractor shall comply with following towards Safety and Social Accountability.</b>
9.11.1	Besides provision with regard to SAFETY under Clause 9.0 of SCC, the contractor will be responsible for Health, Safety & Environment management at site for the construction activities to be carried out by them. The contractor shall continuously take special care to ensure the safety and prevention of human and equipment accidents and maintain good sanitary conditions in and around the site. All the construction work and plant operation must be carried out in the safest possible manner. The Engineer reserves the right to stop any process which, in the Engineer's opinion, is being performed dangerously. In this case the contractor must immediately adhere the requisite safety precautions and any delays attributed to the work stoppage on this account shall not affect the agreed contractual finishing dates.
9.11.2	<p>The contractor shall appoint dedicated full-time Qualified Safety Officers who shall have full authority to ensure that all necessary safety precautions are observed by the Contractor's employees and sub-contractors. These appointees shall have full responsibility for the safety of all personnel within the contractor's area of the works.</p> <p>Some of the common safety rules to be followed during working are as follows :-</p> <ul style="list-style-type: none"> <li>➤ Nobody is allowed to enter at construction site without Safety Shoe.</li> <li>➤ Never enter work area without Safety helmet &amp; chin strap in place.</li> <li>➤ No climbing/working allowed without proper safety belt above 2 m. height.</li> <li>➤ Do not exceed the speed limit 25 Kmph within premises.</li> <li>➤ No debris obstacles allowed on the roads &amp; passages.</li> <li>➤ Do not walk on pipelines or false ceiling.</li> <li>➤ Maintain good Housekeeping at work site.</li> <li>➤ No photography/ Videography allowed without permission</li> <li>➤ All Site supervisors &amp; engineers (including subcontractor's) must be imparted structured training on construction safety before start of the job &amp; record to be maintained.</li> </ul>

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	<ul style="list-style-type: none"> <li>➤ Availability of qualified &amp; trained Site Engineer at site during all working hours.</li> <li>➤ Site Safety training to be imparted to all workers &amp; plan to be made to cover every worker.</li> <li>➤ Tools box talk (5-15 minutes) by supervisor prior to commencement of any job.</li> <li>➤ All accident / incidents(Near Miss) to be reported &amp; investigated.(formats &amp; procedure should be finalized)</li> <li>➤ Daily Safety Checking by Each Site Engineer along with Safety engineer.</li> <li>➤ Weekly co-ordination meeting of all Safety engineers with BHEL safety officer.</li> <li>➤ Monthly safety meeting with Site In-charges.</li> <li>➤ All Safety equipment must be ISI marked &amp; checked by Safety officer before use.</li> <li>➤ Tag system for erection &amp; use of scaffoldings.</li> <li>➤ Bamboo/wooden Scaffolding material not allowed.</li> <li>➤ LPG cylinders not allowed for gas cutting.</li> <li>➤ Good House keeping. Separate waste bins to be used for flammable &amp; non flammable material.</li> <li>➤ Safety awareness programs for workers by display of boards, posters, competitions, talks etc.</li> <li>➤ Deployment of Safety Supervisors for every 250 workers and part there of at work site.</li> <li>➤ Display of List of First Aid trained persons.</li> <li>➤ Testing certificates for lifting tools &amp; tackle.</li> <li>➤ Provision &amp; maintenance of fire extinguishers at construction site &amp; material stores.</li> <li>➤ Display of emergency telephone numbers at various locations.</li> <li>➤ For work in confined space use 24 V lamp fitting &amp; use tools with air motors or electric tools with max. 24 V.</li> <li>➤ For confined space entry Gas test must be done before &amp; at regular intervals.</li> <li>➤ Checking &amp; tag of equipment like grinding machine, welding machine, gas cutting set etc. by supervisors before use.</li> </ul>
9.12	<b>NUISANCE</b>
9.12.1	The Contractor shall not at any time do, cause or permit any NUISANCE on Site or do anything which shall cause unnecessary disturbance or inconvenience to owners, tenants or occupiers of other properties near the Site and to the public generally.
9.13	<b>TREASURE , TROVE , FOSSILS etc.</b>

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9.13.1	All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of BHEL / BHEL's client and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing, shall immediately upon discovery thereof and before removal acquaint the Engineer with such discovery and carryout the Engineer's directions as to the disposal of the same.
9.14	<b>PROTECTION OF WORKS</b>
9.14.1	The contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the Engineer for the protection of the Works or for the safety and convenience of those employed on the Works or the public.
9.14.2	The contractor shall have total responsibility for protecting his works till it is finally taken over by the Engineer. No claim will be entertained by the Engineer for any damage or loss to the contractor's works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with the party concerned. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.
9.15	<b>RECORD FOR MATERIALS CONSUMED</b>
9.15.1	The contractor shall maintain and furnish to the Engineer the RECORD OF MATERIALS consumed in the works for each activity. The statement showing the theoretical vis-à-vis actual consumption of specified materials, such as structural /reinforcement steel, cement, bitumen, lead, paint etc., shall be enclosed along with the running bills submitted by the contractor. Contractor has to also furnish the test results of the materials used in the work as per IS specifications.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

<b>9.16</b>	<b>CLEARANCE OF SITE AND REPAIRS.</b>
9.16.1	Contractor has to clear the site / area where mechanical and electrical erection work is to be commenced / or in progress. The contractor shall remove construction materials and equipment lying in the vicinity and causing obstruction in the erection work within 24 hrs notice. In case, he fails to clear the site, this will be done at his risk & cost by BHEL.
<b>9.17</b>	<b>COMPLETION OF WORK</b>
9.17.1	The works shall be completed to the entire satisfaction of the Engineer and in accordance with the completion schedule as specified in the Contract, and all unused stores and materials, tools, plant, equipment, temporary buildings, site office, labour hutments and other things shall be removed and the site and work cleared of rubbish and all waste materials and delivered up clean and tidy to the satisfaction of the Engineer at the Contractor's expenses.
9.17.2	BHEL shall have power to take over from the Contractor from time to time such sections of the work as have been completed to the satisfaction of the Engineer. Such work however shall not be treated as have been completed until the extra works are executed to the satisfaction of Engineer. The Guarantee period shall commence only after handing over of the entire works.
9.17.3	The Engineer shall certify to the contractor the date on which the work is completed and the date thereof.
<b>9.18</b>	<b>METHOD OF MEASUREMENT</b>
9.18.1	Method of measurements shall be as per standard specifications included in the tender. For other items measurements shall be as per relevant IS Codes.
<b>9.19</b>	<b>DEVIATION</b>
9.19.1	The Contractor shall not make any alteration in, addition to or omission from the work as described in the tender documents except in pursuance of the written instructions of the Engineer. No such deviation from the work described in the tender documents shall be valid unless the same has been specifically confirmed and accepted by the Engineer in writing and incorporated in the Contract.
9.19.2	The Engineer may deviate, either by way of addition or deduction, from the work so described, provided that the Contract sum be not thereby varied on the whole by more than the percentage set out in the tender documents. The value of all additions and deductions shall be added to or deducted from the Contract sum. (Whenever the Engineer intends to exercise such a right his intentions shall specify the deviations which are to be made, the lump-sum assessment or the proposed basis of payment, the extra time allowed, if any, and the date for completion of the entire contract). Any objection by the contractor to any matter concerning the order shall be notified by him in

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

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	writing to the Engineer within seven days from the date of such order, but under no circumstances shall the work be stopped (unless so ordered by the Engineer) owing to differences or controversy that may arise from such an objection. In the absence of such a notification of objection by the Contractor, he will be deemed to have accepted the order and the conditions stated therein.
9.19.3	Valuation of Deviations shall be as per Clause 2.15 & 2.16 of GCC.
<b>9.20</b>	<b>COMPLIANCE TO REGULATIONS AND BYELAWS</b>
9.20.1	The Contractor shall conform to the provisions of any statute relating to the work and regulations and bylaws of any local authority and of any water and lighting Companies or Undertaking with whose system the work is proposed to be connected. He shall, before making any variation from the drawings or the specifications that may be necessitated for such connections give the Engineer, notice specifying the variation proposed to be made and the reasons therefore and shall not carry out any such variation until he has received instructions from the Engineer in respect thereof. The Contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

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<b>10.0</b>	<p style="text-align: center;"><b><u>Chapter X: INDUSTRIAL SAFETY &amp; DUTIES &amp; RESPONSIBILITY OF VARIOUS AGENCIES</u></b></p> <p><b>INDUSTRIAL SAFETY &amp; DUTIES &amp; RESPONSIBILITY OF VARIOUS AGENCIES :</b></p> <p>The contractor shall comply with all provisions of "AERB Safety Guide for Works Contract "Document No. AERB/SG/IS-1, IS 4081, explosive rules_2008 and other safety requirements as applicable to specific site. The Contractor shall meet statutory requirements as well as regulatory requirements applicable to the project, in general and NPCIL in particular, especially the requirements as per Factory Act-1948 (amended in 1987). Atomic Energy Factories Rule-1996 (AEFR-1996 or latest version applicable at the time of work execution), safety guidelines for Job Hazard Analysis (JHA) and AERB notifications on Industrial Fire &amp; Safety. The copies of the same can be obtained from BHEL/NPCIL on request.</p>
10.0.1	<b><u>PRECAUTIONS TO BE FOLLOWED</u></b>
10.0.1.1	<b>PRECAUTIONS AT MAGAZINE AND DURING TRANSPORTATION</b>
10.0.1.1.1	The specification of the magazine should comply with latest provisions in Explosives Act/ Rules.
10.0.1.1.2	Transportation should be done between sunrise & sunset.
10.0.1.1.3	A Tarpaulin should suitably cover the packages containing the explosives.
10.0.1.1.4	Red flags should be displayed on the vehicle authorized by explosive dept
10.0.1.1.5	Explosive should be stored in such a manner that during transportation they should not move and should be protected against bumping and friction.
10.0.1.2	<b>PRECAUTION DURING LOADING OF EXPLOSIVES</b>
10.0.1.2.1	Permit holder shall follow the precautions as stipulated in the explosive Act / Rules.
10.0.1.2.2	Explosives should be thoroughly checked before loading.
10.0.1.2.3	Drilling of the holes and loading of explosives should not be done simultaneously at the same blasting site.
10.0.1.2.4	Detonator leads should be kept short circuited till all explosives are loaded and it should be opened only at the time of the connection.
10.0.1.2.5	No work other than that associated with the loading operation shall be carried out within 10m of the holes.
10.0.1.2.6	Loading should be avoided during thunderstorm, lightening and when stray current passes through the ground. Loading should also be avoided when high voltage line is passing above the blasting area.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

10.0.1.2.7	Use of synthetic clothes by the persons handling detonators and explosives should be avoided.
10.0.1.2.8	Due care should be taken while pulling / untwisting the lead wires of the detonator and while doing so one hand should hold the terminals of wire coming out from detonator.
10.0.1.2.9	Jerks, impacts and friction on detonator should be avoided. Detonator should not be pressed.
10.0.1.2.10	Smoking should be completely prohibited within blasting zone. Fire fighting tools/ material (Water, Sand & CO <sub>2</sub> Cylinder) shall be made available at the blasting site.
10.0.1.2.11	After the completion of the loading, left over explosives, detonators and fuses must be immediately removed from blasting area.
10.0.1.2.12	Care should be taken to ensure that fuses or wires connected to detonators are not damaged during the loading.
10.0.1.2.13	If muffled blasting is being carried out, the cover plates should be covered with gunny bags filled with fine sand.
10.1	<b>SAFETY GUIDELINES</b>
10.1.1	The contractor shall provide and maintain all lights, fencing, guards, warning signs and caution board and similar items as required to ensuring safe working conditions at work site.
10.1.2	The contractor shall comply with the instructions given by departmental safety officer or his representative regarding safety precautions, protection measures and housekeeping etc.
10.1.3	The contractor shall comply with all provisions of AERB Safety Guide for Works Contract Document no. AERB/SG/IS-1 and other safety requirements as applicable to specific site, A copy of guide can be requested from BHEL/NPCIL on request.
10.1.4	The contractor shall provide proper access and working platforms for all place of work as per laid down standards or as advised by Engineer –in-charge or Head-IS&F.
10.1.5	The contractor shall ensure that all floor openings in his work are guarded/barricaded during the course of work and at the end of each day's work.
10.1.6	The contractor shall meet statutory requirements applicable to the project in general and NPCIL in particular especially the requirements as per Factory Act-1948 (amended in 1987), Atomic Energy factories rule-1996 (AEFR-1006 or latest version available at the time of work execution) safety guidelines for Job Hazard Analysis (JHA) & AERB notifications on Industrial & Fire safety. The copies of the same can be obtained from BHEL/NPCIL on request.
10.1.7	The contractor's safety professionals shall be aware about Acts, Rules connected with Industrial Safety and practices particularly applicable to the project and to threat effect they have to undergo an assessment a the project within 15 days of their placement at the project at the cost of the contractor

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

	and then only he/she would be given permanent entry pass and considered in required strength of the safety professionals.
10.1.8	All PPE procured and provided to workers shall conform to relevant Indian Standards and should be maintained in healthy condition by suitable storage, maintenance and inspection.
10.1.9	Contractor working at the height of more than 2.5 metres above stable floor or ground floor must acquire height pass as per procedure including the worker's medical fitness certificate by certifying surgeon (having MBBS qualification) and worker's height qualification etc. If in any height work, the worker is found without having height pass, it will be recorded for regulation of payment. The decision of BHEL engineer with regards to the regulation of payment shall be final and binding.
10.1.10	Contractor shall ensure safe movement of man and material as well as vehicles in site premises as per rules/regulations applicable at or issued by plant. In case of violation of the rules/regulation it will be recorded for regulation of payment. The decision of BHEL engineer with regards to the regulation of payment shall be final and binding.
10.2	SAFETY PLAN
10.2.1	Contractor at his cost shall perform following tasks for the job having high risk as identified by Department Safety Group:
10.2.1.1	Prepare Safe Working Procedures and ensure its implementation in field.
10.2.1.2	Carry out Job Hazard Analysis (JHA) and implement in field.
10.2.1.3	Based on JHA, the safe working procedures should be modified especially includes checklists as necessary checkpoints for job safety supervision.
10.2.1.4	Worker (s) must be trained based on safe working procedure and explained about DOs and DON'Ts prior to assigning him the job.
10.2.1.5	The workers must adhere to the safe working procedure for the job.
10.2.1.6	Contractor shall ensure that all Tools, Appliances, erecting equipment and their safe use by the contractor work force shall be meeting Indian Standards. The contractor must ensure that necessary authorization exist with workmen prior to their deployment on a particular appliance/tool/equipment. The workmen would be required to acquire additional authorization for crane operation, crane signaling, blasting operation, welding and cutting operation, electrical work etc. And then only workmen shall be deployed for such job. He shall maintain all record of tools and equipment for their healthiness and safe use with a copy to departmental safety group.
10.2.1.7	All permits related to material handling works like permission for entry of workers, police verifications of workers required for gate pass, load test certificates of T&P's etc will be arranged by contractor.

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

<b>10.3</b>	<b>DUTIES &amp; RESPONSIBILITY OF VARIOUS AGENCIES:</b>
10.3.1	CONTRACTOR ENGINEER
10.3.1.1	Before authorizing the blasting work permit, the Engineer shall ensure the safety of man, material, public utilities System, if present in the vicinity of the blasting zone by taking appropriate steps. He shall ensure the implementations of job hazards analysis outcome. He shall also ensure that the blaster has got a valid license. He shall send Blasting Notice to all concerned agencies well in advance.
10.3.2	PERMIT HOLDER (REPRESENTATIVE OF CONTRACTOR)
10.3.2.1	The permit holder shall accompany the explosives from the magazine to the loading site. He shall ensure that all necessary precautions are taken during transportation, loading and blasting of explosives. He shall ensure that charging of explosive in holes shall be done in presence of Security representatives & him. Quantity of charge (explosive) per hole shall be as recommended in the work permit. He shall also ensure that shut down of any electrical installation, if so mentioned in the permit, is taken before loading of the explosives. After the blasting, he shall check for any misfired holes and if found, shall do necessary arrangements for exploding them. He shall also check for any damages caused to any electrical or public utility systems and then shall certify the completion of blasting process.
10.3.3	CONTRACTOR SAFETY ENGINEER
10.3.3.1	Safety Engineer shall inspect the blasting zone before forwarding the permit. He shall indicate the precautions to be taken for carrying out the rock blasting work.
10.3.4	REPRESENTATIVE OF SAFETY SECTION
10.3.4.1	The representative of Safety Section shall carry out the verification of the compliance of safety precautions, which are to be taken by the permit holder on sample basis as per the advice of Safety Engineer.
10.3.5	REPRESENTATIVE OF SAFETY OFFICER AUTHORISED BY NPCIL
10.3.5.1	The representative of Safety officer shall check the amount of explosives, detonators, fuses, arc chords etc. brought from the magazine. He shall also ensure that all the unused explosives, detonators, fuses, arc chords etc are taken back to the magazine after completion of blasting and the same entries shall be made in records. Explosives shall be handled up to blasting site in explosive department certified van only. Charging of explosive in the holes shall be done in presence of Engineer & Security representatives. Blasting zone should be properly barricaded & RED flagged and restriction of entry of the Vehicles /Public/ animals etc. to blasting zone shall be ensured at all entry

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

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	points by Safety Officer & work permit holder.
10.3.6	ON DUTY ELECTRICAL SUBSTATION OFFICER
10.3.6.1	The On duty electrical substation Officer shall provide shut down of electrical system, as and when required, on request of the Contractor as per prevailing procedure. He shall energize the system again, only after clearance from the Contractor representative.
10.3.7	RECORDS
10.3.7.1	All records pertaining to the blasting shall be maintained by the Contractor and shall be produced for auditing as and when required.

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
Chapter XI : ANNEXURES

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**ANNEXURE – I**

**BLASTING COMPLETION CERTIFICATE**

1. Date & time of blasting:
2. Location of blasting:
3. Name of Engineer
4. Name of blaster:
5. Name of Permit holder:
6. Name of the Contractor:
7. Detail of Explosives

**Item Quantity brought in Quantity Used Balance**

<b>Item</b>	<b>Qty brought In</b>	<b>Qty Brought Out</b>	<b>Balance</b>
Gelatin rods			
Detonators			
Safety fuse			
C/R			
<b>D Fuse</b>			
No. of holes Blasted			

**(Strike out which ever inappropriate)**

- A. The blasting has been carried out as per our satisfaction. No damage has been caused to person or property.
- B. The following deficiencies/damages were observed during/after blasting:
- (i) .....
- (ii) .....

Signature  
**(Name & Desig. of contractor  
BHEL**

Signature  
**Name & Desig. of Safety officer**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter XI : ANNEXURES

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### ANNEXURE-II

#### **BLASTING WORK PERMIT**

**Permit no.**

**Dated:**

1. Name of the Blaster:
2. License No. :
3. Place & location where blasting is to be carried out:
4. Time & Date when to be carried out:
5. No. of holes/amount of explosive:
6. Type of detonator to be used:
7. Type of blasting to be carried out: Open / Muffled
8. Name of permit holder (NPCIL), deputed by Contractor for blasting:
9. Job hazards analysis of the job carried out:  
(Attached the report)
10. If any civil structures/public utility: system/ O.H.  
Electric lines are present in the premises of blasting.  
If so, give details. (If yes, clearance required):
11. Blasting Notification letter No & Date:
12. Name of the Company:

Signature

**(Name & Desig. of contractor)**

Signature

**(Name & Desig. of Permit Holder)**

All Control measure has been taken as per the outcome of job hazards analysis. Precautionary measure has been taken for safety of electrical installations & public utilities systems presents in the vicinity of the blasting zone. Blaster has got a valid license. Blasting Notice sent and acknowledgement received from all concerned agencies / required authorities / local Police well in advance and work Permit is authorized.

**Name & Desig. of BHEL Engineer**

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
Chapter XII : UNPRICED RATE SCHEDULE

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**Annexure-A**

**UNPRICED RATE SCHEDULE**

**Job:- Excavation work of Hard Rock – Requiring Blasting by Mechanical Means (Hydraulic Excavator/Manual Means) of Pits for Tree Plantation at 2 X 700 MW, RAPP 7 & 8 OF NPCIL.**

Sl. No.	Description of work	Total Value in Rupees (In figures and words "A")
1	Excavation work of Hard Rock – Requiring Blasting by Mechanical Means (Hydraulic Excavator/Manual Means) of Pits for Tree Plantation at 2 X 700 MW, RAPP 7 & 8 OF NPCIL.	
<b>Total Amount (Rs.)</b>		

**Notes:-**

**The rates of different items for the entire scope shall be worked out & awarded as per Annexure 'B'.**

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter XII : UNPRICED RATE SCHEDULE**

**Annexure – B**

**Calculation ratio for different items based upon the total value as per rate schedule**

Sl. No.	Description of work	Unit	Qty.	Rate per unit in Rupees (In figures and words)
1	Excavation in Hard rock (REQUIRING CONTROLLED BLASTING) by mechanical means (Hydraulic excavator)/ manual means; for digging of pits for tree plantation including clearing all grass, vegetation etc. Area of pit shall be one sqm and depth approx. 1 mtr, pits shall be at 3 mtrs center to center. This includes trimming of excavation bottom, stacking, levelling, grading etc of excavated material, dressing of sides and ramming of bottoms, lift upto 1m, including getting out the excavated material and disposal of surplus excavated material within a lead of 100 mtr as directed by BHEL Engineer and as per specifications. ( Size of Pit : 1000 mm X 1000 mm X 1000 mm )	NOS.	21700	$\frac{A \times 4.1554}{100000}$
	Extra over item no. 101 above for carriage (including loading, unloading, stacking etc.) of all types of excavated materials beyond the initial lead of 100 mtr all complete as per specifications, drawings and instructions of the BHEL Engineer for the following leads.	-	-	-
2	Carriage beyond initial lead of 100 mtr but not exceeding 2 km.	Cum	12500	$\frac{A \times 0.3786}{100000}$
3	Carriage beyond initial lead of 100 mtr but not exceeding 3 km.	Cum	5000	$\frac{A \times 0.4790}{100000}$
4	Carriage beyond initial lead of 100 mtr but not exceeding 4 km.	Cum	3000	$\frac{A \times 0.5931}{100000}$
5	Carriage beyond initial lead of 100 mtr but not exceeding 5 km.	Cum	1000	$\frac{A \times 0.7392}{100000}$

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter XII : UNPRICED RATE SCHEDULE**

6	Carriage beyond initial lead of 100 mtr but not exceeding 7 km.	Cum	100	$\frac{A \times 0.7481}{100000}$
7	Carriage beyond initial lead of 100 mtr but not exceeding 10 km.	Cum	100	$\frac{A \times 1.0701}{100000}$

**Note:-**

- 1. Conditional price bids or price bids with any deviation/ clarification etc. are liable to be rejected. No cutting / erasing / over writing shall be done.**
- 2. In case of any mismatch in rate and amount on price discrepancy, the same will be dealt as per clause no. 1.4 of GCC.**



GOVERNMENT OF INDIA

## **AERB SAFETY GUIDE**

# **SAFETY GUIDE FOR WORKS CONTRACT**

**ATOMIC ENERGY REGULATORY BOARD**

**AERB/SG/IS-1**

**SAFETY GUIDE**  
**FOR**  
**WORKS CONTRACTS**

Government of India  
Atomic Energy Regulatory Board  
Bombay – 400 095

August 1991

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## FOREWORD

Generally the number of accidents are more during construction phase of a Project. These accidents involve mostly contractor workers. A need for a single document in the form of a guide or a manual defining the work situations during construction phase and the required safety precautions/procedures/equipment to be taken/followed/used was recognized by DAE SRC. In its meeting No. 259 held on 5<sup>th</sup> February, 1986, a Committee with Shri K.S. Somayaji as the Convenor was constituted to look into the type of accidents occurring during construction phase and also to evolve a guide to contain safety precautions that are required to be taken in the construction activities.

This Sub-Committee's report was discussed by DAE SRC in its meeting No. 271 held on 18<sup>th</sup> June 1986 but unfortunately could not be finalized. On January 3, 1990, this document was circulated to all the units of DAE and also to members of SARCOP for their comments. Several units and members of SARCOP have given their comments and these comments were further reviewed by another Group in consultation with Shri K.S. Somayaji. This Group eventually finalized the guide in its present form taking note of the comments from all the agencies.

In this guide certain qualitative terms like adequate, minimum, near, suitable, good quality, sufficient, etc. have been used, since it is not possible to quantify them for the varied nature of jobs that are being handled at the construction sites. It is recommended that the Safety Engineer and the concerned Engineer In-Charge may be consulted for their better judgment on meeting the qualitative requirements.

#### IV

This guide was finally discussed at SARCOP Meeting No. 88 held on 22<sup>nd</sup> August, 1990 and was approved. Every unit of DAE and its Undertakings are required to use the document as a guide to be followed in the award of works contracts to the contractors for compliance with the safety precautions laid down. It is incumbent that this guide be included as part of the tender document for effective compliance.

SARCOP places on record its appreciation for the interest shown by various agencies and individuals in scrutinizing the draft and sending their comments. SARCOP also places on record its appreciation of the time and effort put in by the Committee and the Group to bring this guide in its final form.

(S.D. Soman)  
Chairman, AERB

Bombay  
August 1991

# **SAFETY GUIDE FOR WORKS CONTRACT**

## **1. INTRODUCTION**

Many of the works of Department of Atomic Energy at its various sites are executed by the contractors. During these works, contractors personnel are likely to be exposed to different types of hazards. Similarly, unsafe acts of contractors personnel may generate hazards for Departmental staff and/or workmen of other contractors working at the site. Such unsafe acts may also pose danger to the existing installations and even to members of public. This guide is prepared to facilitate safe working during execution of contract works. It is hoped that units of DAE may issue this guide as a part of contract documents while awarding contracts.

## **2. GENERAL SAFETY PROVISIONS**

- 2.1 The Contractor shall take all safety precautions during the execution of awarded work and shall maintain and leave the site safe at all times. At the end of each working day and at all times when the work is temporarily suspended, he shall ensure that all materials, equipment and facilities will not, cause damage to existing property, personal injury or interfere with the other works of the Project or Station. The Contractor shall comply with all applicable provisions of the safety regulations, clean up programme and other measures that are in force at the site.
- 2.2 The Contractor shall provide and maintain all lights, guards, fencing, warning signs, caution boards and other safety measures and provide for vigilance as and where necessary or as required by the Engineer-in-charge or by any duly constituted authority for the protection of workers or for the safety of others. The caution boards shall also have appropriate symbols.
- 2.3 Adequate lighting facilities such as flood lights, hand lights and area lighting shall be provided by the Contractor at the site of work, storage area of materials and equipment and temporary access roads within his working area. The Contractor shall obtain written approval of the Engineer-in-charge to the lighting scheme and place of tapping prior to its installation.
- 2.4 The Contractor shall plan his operations so as to avoid interference with the other Departmental works, other Contractors or sub-Contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the Department for safe and smooth working.

- 2.5 The Contractor and his sub-contractor, if any shall comply with the instructions given by the Safety Engineer or his authorized nominee regarding safety precautions, protective measures, house keeping requirements, etc. The Safety Engineer with due intimation to Engineer-in-Charge shall have the right to stop the work of the Contractor, if in his opinion proceeding with the work will lead to an unsafe and dangerous condition. Engineer-In-Charge shall get the unsafe condition removed or provide protective equipment at the contractors cost. The contractor can employ his own Safety Engineer or nominate one of his officers for liaison with Departmental Safety Engineer for ensuring compliance of all safety rules. Contractor shall ensure that all his workmen are aware about the nature of risk involved in their work and have adequate training for carrying out their work safely.
- 2.6 The contractor shall be held responsible for non-compliance of any of the safety measures and delays, implications, injuries, fatalities and compensation arising out of such situations or incidents.

### 3. TRAFFIC

- 3.1 The Contractor shall conduct his operations so as to interfere as little as possible with the use of existing roads at or near locations where the work is being performed.
- 3.2 When interference to traffic is inevitable, notice of such interference shall be given to the Engineer-in-charge well in advance (atleast 48 hours) with the details of start of the work and time required, storage of materials, and details of the proposed methods of providing the required facilities for safe and continuous use of roads and obtain his clearance.
- 3.3 The Contractor shall, at his own expense, make such approved temporary provisions as are required to maintain atleast one lane of traffic by bridging the excavation, providing ramps over surface obstructions or providing suitable temporary bye-pass around the obstructions. The Contractor shall exercise full care to ensure that no damage is caused by him or his workmen, during the operation, to the existing water supply, sewerages, power or telecommunication lines or any other services or works. The Contractor shall be required to provide and erect before construction, substantial barricades, guard-rails, and warning signs. He shall furnish, place and maintain adequate warning lights, signals, etc., as required by Engineer-in-charge.

#### 4. SAFE MEANS OF ACCESS

- 4.1 Adequate and safe means of access and exit shall be provided for all work places, at all elevations. Using of scaffolding members (avoiding a ladder) for approach to high elevations shall not be permitted.
- 4.2 Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short duration work as can be done safely from ladders. Ladder shall be of rigid construction having sufficient strength for the intended loads and made either of good quality wood or metal and all ladders shall be maintained well for safe working condition. An extra mazdoor shall be engaged for holding the ladder if ladder is not securely fixed. If the ladder is used for carrying materials as well, suitable foot holds and hand holds shall be provided on the ladder. The ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical). Ladders shall not be used for climbing carrying materials in hands. While climbing both the hands shall be free.
- 4.3 Scaffolding or staging more than 3.5 m above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a standard guard rail properly attached, bolted, braced or otherwise secured at least 1.0 m high above the floor or platform of such scaffolding or staging. The guard rail shall extend along the entire exposed length of the scaffolding with only such opening as may be necessary for the delivery of materials. Standard railing shall have posts not more than 2 m apart and an intermediate rail halfway between the floor or platform of the scaffolding and the top rail. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure. Scaffolding and ladder shall conform to relevant IS specification (IS 3696-1966). Timber/Bamboo scaffolding shall not be used.
- 4.4 Working platforms of scaffolds shall have toe boards atleast 15 cm in height to prevent materials from falling down.
- 4.5 A sketch of the scaffolding proposed to be used shall be prepared and approval of the Engineer-in-charge obtained prior to start of erection of scaffolding. All scaffolds shall be examined by Engineer-In-Charge before use.
- 4.6 Working platform, gangways and stairways shall be so constructed that they shall not sag unduly or unequally and if the height of the platform or gangway or stairway is more than 3.5 m above ground level or floor level, they shall be closely boarded, shall have adequate width for easy

movement of persons and materials and shall be suitably guarded as described in 3.3 above.

- 4.7 The planks used for working platform shall not project beyond the end supports to a distance exceeding four times the thickness of the planks used. The planks shall be rigidly tied at both ends to prevent sliding and slippage. The thickness of the planks shall be adequate to take load of men and materials and shall not collapse.
- 4.8 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing, the minimum height of which shall be 1.0 m, along with 15 cm high sheet obstruction at floor level along the railing.
- 4.9 Safe means of access shall be provided to all working platforms and other elevated working places. Every ladder shall be securely fixed. No single portable ladder shall be over 9 m in length. For ladders upto 3m in length the width between side rails in the ladder shall in no case be less than 300 mm. For longer ladders this width shall be increased by atleast 20 mm for each additional meter of length. Step spacing shall be uniform and shall not exceed 300 mm.
- 4.10 Adequate precautions shall be taken to prevent danger from electrical lines and equipment. No scaffolding, ladder, working platform, gangway runs, etc. shall exist within 3 meters of any uninsulated electric wire. Whenever electric power and lighting cables are required to run through (pass on) the scaffolding or electrical equipments are used, such scaffolding structures shall have minimum two earth connections with earth continuity conforming to IS Code of Practice.

## 5. EXCAVATION, TRENCHING AND EARTH REMOVAL

All trenches 1.2 m or more in depth shall at all times be supplied with at least one ladder for each spacing of 30 m in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 m above the surface of the ground.

The sides of the trench which are 1.2 m or more in depth shall be stepped back to give suitable slope (angle of repose) or securely held by timber bracing, so as to avoid the danger of sides from collapsing. The excavated material shall not be placed within 1.5 m of the edges of the trench or half of the depth of the trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances mining or under-cutting shall be done.

The contractor shall ensure the stability and safety of the excavation, adjacent structures, services and the works.

Open excavations shall be fenced off by suitable railing and warning signals installed at night at well lit places so as to prevent slipping or falling into the excavations.

All blasting operations shall be carried out on the basis of procedures approved by Inspector of Explosives. All works in this connection shall be carried out as per IS Code of Practice. Barricades, Warning Signs etc. shall be placed on the roads/open area. Prior approval of such operation shall be obtained from Safety Engineer/Engineer-In-Charge of works.

- a) For removal of earth from an earth mound a written permission shall be obtained from the Engineer-In-Charge of the work and the Engineer-In-Charge of the earth mound.
- b) As far as practical, earth shall be removed mechanically.
- c) Wherever manual removal of earth is involved, earth shall be removed from the top by maintaining the proper slope equal to the angle of re-pose of the earth.
- d) Such work shall be constantly supervised by the contractor's responsible person and frequently inspected by the departmental representative to ensure that no under-cutting is done.

## 6. CONCRETING

Shuttering and supporting structures shall be of adequate strength and approved by Engineer-In-Charge. This shall be ensured before concrete is poured. The procedure approved by Engineer-In-Charge shall be followed for mixing, transporting and pouring of concrete.

## 7. DEMOLITION

Before any demolition work is commenced and also during the progress of the work:

- (a) All roads and open area adjacent to the work site shall either be closed or suitably protected. Appropriate warning signs shall be displayed for cautioning approaching persons.
- (b) Before demolition operations begin, the Contractor shall ensure that the power on all electric service lines is shut off and the lines cut or disconnected at or outside the demolition site. If it is necessary to

maintain electric power during demolition operation, the required service lines shall be adequately protected against damage. Persons handling heavy materials/equipments shall wear safety shoes.

- (c) No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.
- (d) Entries to the demolition area shall be restricted to authorized persons only.

## 8. PERSONAL PROTECTIVE EQUIPMENT

All necessary personal protective equipment as considered necessary by the Engineer-In-Charge shall be kept available by contractor for the use of the persons employed on the site and maintained in a condition suitable for immediate use. Also the Contractor shall take adequate steps to ensure proper use of equipment by those concerned. The personal protective equipments are to be provided by the contractor.

- (a) All persons employed at the construction site shall use safety helmets. For other types of works, persons working in that area shall also use safety helmets, if advised by Safety Engineer/Engineer-In-Charge.
- (b) Workers employed on mixing asphaltic materials, cement and lime mortars shall use protective goggles, protective foot wear and hand gloves. Use of proper respirators shall be an advantage.
- (c) Persons engaged in welding and gas cutting works shall use suitable welding face shields. The persons who assist the welders shall use suitable goggles. Protective goggles shall be worn while chipping and grinding.
- (d) Stone breakers shall use protective goggles. They shall be seated at sufficiently safe intervals of distance.
- (e) Persons engaged in or assisting in shot blasting operations and cleaning the blasting chamber shall use suitable gauntlets, overalls, dust-proof goggles, boots and protective hood supplied with fresh air at the minimum rate of 9 m<sup>3</sup> /hr.
- (f) All persons working at heights more than 4.5 m above ground or floor and exposed to risk of falling down shall use safety belts, unless otherwise protected by cages, guard railings, etc. In places where the use of safety belts is impractical, suitable net of

adequate strength fastened to substantial supports shall be employed.

- (g) All powered two-wheeler motorcycle and scooter drivers and their pillion riders shall wear crash helmets inside the Project/Plant sites.
- (h) When workers are employed in sewers and inside manholes which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. After it has been well-ventilated, the atmosphere inside the space shall be checked for the presence of any toxic gas or oxygen deficiency and recorded in the register before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

## 9. PAINTING

9.1 The Contractor shall not employ women on the work of painting with products containing lead in any form. Only men above the age of 18 years shall be employed on the work with lead paint. The following precautions shall be taken during the work.

- \* Supplied air respirators shall be provided for use by the workers when paint is applied in the form of spray, or a surface having lead paint is dry rubbed or scraped.
- \* Overalls shall be supplied by the Contractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.
- \* All painting jobs, especially those in which lead paints are used shall be kept under industrial hygiene surveillance.

9.2 Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national/regional language, "SMOKING – STRICTLY PROHIBITED" shall be displayed in the vicinity where painting is in progress or where paints are stored. Symbols shall also be used for caution boards.

Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.

When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. If adequate ventilation cannot be provided, workers shall wear suitable respirators.

- 9.3 Epoxy resins and their formulations used for painting shall not be allowed to come in contact with the skin. The workers shall use plastic gloves and/or suitable barrier creams.

Adequate ventilation shall be provided especially when working with hot resin mixes.

Increased personal hygiene shall be practiced to control inadvertent contact with the resin and eliminate its effects.

Workers shall thoroughly wash hands and feet before leaving the work. Work clothes shall be changed and laundered frequently.

## 10. LIFTING MACHINES AND TACKLES

- 10.1 Use of lifting machines and tackles including their attachments, anchorage and supports shall conform to the following standards or conditions.

- (a) Lifting machines and tackles shall be of good mechanical construction, sound material and adequate strength and free from any defects and shall be kept in good repair and in good working order.

Every rope used in hoisting or lowering materials or as a means of suspension shall be of good quality and adequate strength and free from any defect.

- (b) Every crane operator or lifting appliance operator shall be properly qualified. No person under the age of 21 years shall be in charge of any hoisting machine or give signal to operator of such machines.

- (c) In case of every lifting machine (and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or as means of suspension) the safe working load shall be ascertained and clearly marked. In case of a lifting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing. This shall be approved by the Safety Engineer.

- (d) In case of departmental machines, the safe working load shall be notified by the Engineer-in-charge. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work and get it verified by the Engineer-in-charge, supported by a valid test certificate by the Competent Person.
  - (e) Thorough inspection and load testing of lifting machines and tackles shall be done by a competent person atleast once every 12 months and records of such inspection and testing shall be maintained.
- 10.2 Motors, gearing transmission, couplings, belts, chain drives and other moving parts of hoisting appliances shall be provided with adequate safeguards. Hoisting appliances shall be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced or lowered.

## 11. WELDING AND GAS CUTTING

- 11.1 Welding and gas cutting operations shall be done only by qualified and authorized persons and as per IS specifications and Code of Practice.
- 11.2 Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.
- 11.3 Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.
- 11.4 Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is done in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on persons or flammable materials.
- 11.5 Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter glasses of appropriate shade shall be worn as face protection.
- 11.6 Adequate ventilation shall be provided while welding in confined space or while brazing, cutting or welding zinc, brass, bronze, galvanized or lead coated materials.

- 11.7 Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied, cleaned thoroughly and it is made certain that no flammable material is present.
- 11.8 Fire extinguisher shall be available near the location of welding operations. Fire Safety Permit shall be obtained for working at vulnerable areas and operating areas before flame cutting/welding is taken up.
- 11.9 For electric (Arc) welding the following additional safety precautions shall be taken :
- i) When electrical welding is undertaken near pipe lines carrying flammables, such pipe lines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.
  - ii) Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.
  - iii) Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
  - iv) The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that the cables are not damaged by movement of materials.

## 12. GRINDING

- 12.1. All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- 12.2. Grinding wheels of specified diameter only shall be used on a grinder – portable or pedestal – in order not to exceed the prescribed peripheral speed.
- 12.3. Goggles shall be used during grinding operation.

## 13. ELECTRICITY

Guidelines for providing temporary power supply at the site and general safety procedures for using electricity are given in the enclosed Annexure.

#### 14. HOUSE KEEPING

- 14.1 The Contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment.
- 14.2 Welding and other electrical cables shall be so routed as to allow safe traffic by all concerned.
- 14.3 No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Engineer-in-charge may require the Contractor to remove any materials which are considered to be of danger or cause inconvenience to the public. If necessary, the Engineer-in-charge may cause them to be removed at the Contractor's cost.
- 14.4 At the completion of the work, the Contractor shall have removed from the work premises all scaffoldings, surplus materials, rubbish and all huts and sanitary arrangements used/installed for his workmen on the site.
- 14.5 The Engineer-in-charge has the right to stop work if the Contractor fails to improve upon the housekeeping after having been notified.

#### 15. FIRE SAFETY

All necessary precautions shall be taken to prevent outbreak of fires at the construction site. Adequate provisions shall be made to extinguish fires should they still break out.

- (a) Quantities of combustible materials like timber, bamboos, coal, paints, etc., shall be the minimum required in order to avoid unnecessary accumulation of combustibles at site.
- (b) Containers of paints, thinners and allied materials shall be stored in a separate room which shall be well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
- (c) Fire extinguishers as approved by the Engineer-in-charge shall be located at the construction site at appropriate places.
- (d) Adequate number of Contract workmen shall be given education and training in fire fighting and extinguishing methods.

16. SAFETY WORK PERMIT

- 16.1 In order to ensure safety of work for hazardous operation (such as entry into confined spaces, welding/cutting on equipment/pipes where explosion hazards is present, works on high voltage and main medium voltage lines, blasting etc.) special Safety Work Permits (SWP) shall be raised. The SWP's shall also to be obtained for any other work as recommended by Safety Engineer.
- 16.2 The Contractor shall strictly ensure all the safety conditions and requirements stipulated in the Safety Work Permit. The decision of the Safety Engineer shall be final in this regard.

17. WORK IN RADIATION AREA

The Contractor shall follow the stipulated procedure regarding work in the radiation area and other works related with radiography.

18. WORK IN AND AROUND WATER BODIES

When the work is done near any place where there is risk of drowning, all necessary rescue equipment such as life buoys and life jackets shall be provided and kept ready for use and all necessary steps taken for prompt rescued of any person in danger and adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work. Persons who do not know swimming shall not be engaged alone for any work where risk of drowning exists. Sufficient number of life buoys or life jackets shall be provided.

19. MEDICAL FACILITIES

- 19.1 The Contractor shall arrange adequate facilities for medical aid and treatment for his staff and workers engaged on the work site including the first-aid facilities if they are not available at the Project Site.
- 19.2 First-aid appliances including sterilized dressing, cotton wool and antiseptic cream shall be made available at a readily accessible places at every work site. These shall be maintained in good order under the charge of a responsible person.
- 19.3 At large work places where hospital facilities are not available within easy reach of the works, first-aid posts shall be established and be manned by a trained compounder. An ambulance shall be available during the entire period of work for attending to injury cases.

20. SAFETY OFFICER/SAFETY COORDINATOR

The Contractor shall have a Safety Officer or a supervisor to be designated as a Safety Coordinator in order to specifically look into the implementation of different safety requirements of the contract work. The person thus designated will in general co-ordinate with the Engineer-in-charge on matters of safety and in particular ensure that the Safety Guide is complied with fully. His name shall be displayed on the Notice Board at a prominent place at the work site.

21. REPORTING OF ACCIDENT

21.1 All accidents leading to property damage and/or personnel injuries shall be reported to the Engineer-in-charge immediately who shall inform SARCOP to be followed up with detailed accident reports in prescribed form.

21.2 Contractor shall also submit a monthly statement of accidents to Engineer-in-charge by 4<sup>th</sup> of every month showing details of accident, nature of injury including disability, days lost, treatment required etc., and the extent of property damage.

22. PUBLIC PROTECTION

The Contractor shall make all necessary provisions to protect the public. He shall be bound to bear the expenses for defence of every action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of any precaution required to be taken to protect the public. He shall pay any damage and cost which may be awarded in any such suit, action or proceedings to any such person, or the amount which may be fixed as a compromise by any such person.

23. OTHER STATUTORY PROVISIONS

Notwithstanding the above clauses from 1 to 21 there is nothing in these to exempt the Contractor from the provisions of any other Act or Rules in force in the Republic of India. In particular all operations involving the transport, handling, storage and use of explosives shall be as per the standing instructions and conform with the Indian Explosives Act, 1884 and The Explosives Rules, 1983. Handling, transport, storage and use of compressed gas cylinders and pressure vessels shall conform with the Gas Cylinder Rules 1981 and Static and Mobile Pressure Vessels (Unfired) Rules 1981. In addition, The Indian Electricity Act 1910 and Indian Electricity Rules 1956, the Atomic Energy Act, 1962, the Radiation Protection Rules 1971, Radiation Protection Manual of Nuclear Facilities

and the Atomic Energy (Factories) Rules 1988 and various rules and Act related to mining shall also be strictly complied with.

## ANNEXURE

### GUIDELINES AND GENERAL PROCEDURES FOR SUPPLY AND USE OF ELECTRICITY AT SITE

#### 1. GENERAL

Following safety requirements shall be complied with before the Contractor uses the power supply.

- 1.1 The Contractor shall submit a list of licensed electrical staff to be posted at site.
- 1.2 It shall be the responsibility of the Contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-in-charge/Electrical Engineer.
  - a) Indian Electricity Act, 1910
  - b) Electricity (Supply) Act, 1948
  - c) Indian Electricity Rules, 1956
  - d) National Electric Code 1985
  - e) Other relevant rules of Local Bodies and Electricity Boards.

After installation of the electrical power wiring works by the contractor, form of completion certificate as per IS 732 (Form SGCW-1) shall be submitted by the contractor duly signed by the authorized valid licensed electrical contractor and/or supervisor along with one copy of the contractor's license and/or competency certificate of supervisor issued by the Electricity Board/Government Electricity Organization as per the enclosure.

The power supply shall be regulated as per the terms and conditions of the supply of the respective electricity boards.

- 1.3 (a) For purposes of electrical load and power planning by the electrical section, the contractor shall furnish along with the tender, the estimated load requirement of electric power for the execution of the contract works in terms of maximum Kilo Watt or KVA demand during various periods/months of the contract period along with the details of the construction electrical equipment/machinery with their individual load details and location/locations of power supply

required for availing temporary electric power supply in the standard proforma enclosed (Form SGCW-2).

- (b) The electric power supply will be generally made available at one point in the works site of the contractor by the department.
  - (c) Where distribution boards are located at different places the Contractor shall submit schematic drawing indicating all details like size of wires, Over Head or cable feeders, earthing etc. The position and location of all equipment and switches shall be given.
- 1.4 The Contractor shall make his own arrangements for main earth electrode and tappings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant I.S. Specifications (IS-3043)
- 1.5 All three phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.
- 1.6 All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.
- 1.7 The Contractor shall not connect any additional load without prior permission of Departmental Electrical Engineer. For obtaining additional power required, test reports of the tests mentioned in (d) of Form SGCW-1 shall be submitted.
- 1.8 Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However, tappings from an earth bus may be done.
- 1.9 The entire installation shall be subjected to the following tests before energisation installation including portable equipment :
- a) Insulation resistance test
  - b) Polarity test of switches
  - c) Earth continuity test
  - d) Earth electrode resistance

The test procedures and their results shall conform to relevant IS Specifications. The Contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.

2. The following are provided for general guidance of the Contractor and shall be read as specific requirement, in addition to complying with Indian Electricity Act, Indian Electricity Rules and IS Specifications.

### 2.1 Installation

- a) Only persons having valid wireman's license/competency certificate shall be employed for carrying out electrical work and repair of electrical equipment, installation and maintenance at site. The job shall be supervised by a qualified licensed Supervisor.
- b) Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- c) Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards.
- d) The minimum clearance to be maintained for all overhead lines along roads and across roads shall be as per the statutory requirements as listed in clause 1.2 of Annexure.
- e) Grounding conductor of wiring system shall be of copper or other corrosion-resistant material. An extra grounding connection shall be made in appliances/equipment where chances of electric shock is high.
- f) Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses be used in all circuits. For load of 5 KW or more earth leakage circuit breaker shall be provided in the circuits.
- g) Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables/wires and earthed effectively. Metallic poles as a general rule, shall be avoided and if used shall be earthed individually. Anticlimbing guards and danger

notices shall be provided on poles. Each equipment shall have individual isolating switches.

- h) Wires and cables shall be properly supported and an approved method of fixing shall be adopted. Loose hanging of wires & cables shall be avoided. Lighting and power circuits shall be kept distinct and separate.
- i) Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- j) All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid under ground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC) tile or any other approved means.
- k) All armoured cables shall be properly terminated by using suitable cable glands. Multistranded conductor cables shall be connected by using cable lugs/sockets. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- l) All cable glands, armouring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.
- m) All the Distribution Boars, Switch Fuse units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and water proof. The Distribution Boards, switches etc. shall be so fixed that they shall be easily accessible. Changes shall be done only after the approval of the Departmental Electrical Engineer.
- n) The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all the switch board, equipment etc. against rain. Exposed live parts of all electrical circuits & equipment shall be enclosed permanently. Crane trolley wires and other conductors which cannot be completely insulated shall be placed such that they are inaccessible under normal working conditions.

- o) Iron clad industrial type plug outlets are preferred for additional safety.
- p) Open type Distribution Boards shall be placed only in dry and ventilated rooms; they shall not be placed in the vicinity of storage batteries or otherwise exposed to chemical fumes.
- q) Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.
- r) In front of distribution boards a clear space of 90 cm shall be maintained in order to have easy access during an emergency.
- s) Adequate working space shall be provided around electrical equipment which require adjustment or examination during operation.
- t) As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in work room where there is possibility of explosion hazards shall be explosion proof.
- u) All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron frame work shall be used.
- v) All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.
- w) Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weather proof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- x) The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakages.

Only 24 V supply system shall be used for hand lamps etc. while working inside metallic tanks or conducting vessels.

- y) After installation of new electric system and or other extensive alterations to existing installations, thorough inspection shall be made by Departmental Electrical Engineer before the new system or new extension is put in use.
- z) Contractor shall ensure that power factor for their loads shall be maintained at 0.85. In case the power factor falls below 0.85, necessary capacitor units shall be provided by the contractor.

## 2.2 Operation & Maintenance

- a) All persons who work with electrical installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques.
- b) The supervisor shall instruct the workers in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden ladders shall be used to reach the heights in electrical work.
- c) No material or earth work shall be allowed to be dumped below or in the vicinity of the bare overhead line conductors.
- d) Separate work permits shall be issued for individual group leaders working on the same system which shall be returned after the completion of the work to Safety Supervisor and no system shall be energized without the clearance of Safety Supervisor.
- e) Before any maintenance work is commenced on electrical installations/equipment, the circuits shall be de-energized and ascertained to be dead by positive test with an approved voltage testing device. Switches shall be tagged or the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects viz.
  - i) That there shall be no danger from any adjacent live parts and
  - ii) That there shall be no chances of re-energisation of the equipments on which the persons are working.

- f) While working on or near a circuit, whenever possible the use of one hand may be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.
- g) When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not 'freeze' to the conductor.
- h) Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet.
- i) Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.
- j) When two persons are working within reach of each other, they shall never work on different phases of the supply.
- k) When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment/circuit.
- l) It shall be ensured that the insulation and wire size of extension cords are adequate for the voltage and current to be carried.
- m) While tapping electricity from the socket, plug top must be used. It shall be ensured that no extension boards are over loaded while tapping. Only standard three pin plugs shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with goods ones. Only joint free cables shall be used for connecting equipment/apparatus.
- n) Floors shall be kept free from trailing electrical cables to avoid tripping hazard.
- o) Power supply to all the machines and lighting fixture, shall be switched off when not in use.
- p) Temporary electrical connections shall be removed as soon as the stipulated work is over. After completion of the works, the Contractor shall dismantle the distribution boards and the other facilities he may have erected.

- q) Unauthorized tapping of power by others from distribution boards under the control of the contractor shall be prohibited at all circumstances.
- r) No flammable materials shall be stored in any working area near the switch boards.
- s) Safety work permits shall be used for switching off the main feeder and equipment by the contractor.
- t) "MEN ON LINE" "DO NOT SWITCH ON" "DANGER" or "CAUTION" board as applicable shall be used during maintenance works on the electrical equipment.

### 2.3 Portable electrical equipment

- a) Portable electrical equipment shall be regularly examined, tested and maintained to ensure that the equipment and its leads are in good order. Register shall be maintained for inspection recording the testing dates and results of the equipments.
- b) All portable appliances shall be provided with three core cable and three pin plug. The third pin of the plug shall invariably be earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed.
- c) All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wire in one length. No joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.
- d) Flexible cables for portable lamps, tools, and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.

**FORM NO. SGCW – 1**

**FORM FOR COMPLETION CERTIFICATE**

(Prescribed under cl. 1.2 of Annexure)

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 1956 as well as IS:732-1963 code of practice for Electrical Wiring Installations. (System voltage not exceeding 650 Volts (Revised)).

Electric installation at .....

Voltage and system of supply .....

a)	Particulars of work	Number	Total load	Type of system of wiring
		-----	-----	-----
	i) Light Points			
	ii) Fan points			
	iii) Plug points (3 pin)			
	iv) Motors			

b) If the work involves installation of overhead lines and/or underground cable \_\_\_\_\_

c) Earthing:

Description of earthing electrode, size of earth wire and number of electrodes provided:

d) Test results:

1. Insulation resistance for the whole installation:
  - i) Between conductors
  - ii) Between each conductor and earth
2. Resistance of earthing electrode or earthing system.
3. Maximum earthing resistance of installation

Signature of Supervisor  
Name and address  
of Supervisor.

Signature of Contractor  
Name and address  
of Contractor.

**FORM NO. SGCW – 2**

**'A' APPLICATION FOR SERVICE CONNECTION BY CONTRACTOR**

(Prescribed under cl. 1.3 of Annexure)

(to be filled in triplicate)

1. Name & Address of Contractor :
2. Reference to Tender & Work Order :
3. Completion period :
4. Connected load details (please attach details in a separate sheet) :
5. Max. demand anticipated :
6. Nature of service connection required (whether single or three phase) :
7. Place where service required :
  - a) Works :
  - b) Colony :
8. If supply of electricity is free or chargeable (please enclose extract of conditions from the tender) :
9. Details of meter provided :
  - a) If meter required from the Department, whether SD is paid :
  - b) Details of SD (Security Deposit) :
  - c) Whether meter is tested or not, if tested, attach test report, if not, details of testing fee deposited :
10. Name of Supervisor/Electrician in charge of installation and maintenance :
11. Electrical license No. of person mentioned against col. 10 :

12. Electrical safety appliances available for use :

13. Fire extinguishers available for use :

14. First Aid facility/box available for use, if any. :

(Signature of the Contractor)

Date:

Name:

**'B' CERTIFICATE BY THE CONTRACTOR**

Certified that my/our installations have been carried out in accordance with I.E. Rules and that I/We have employed competent persons to handle the installations.

I/we am/are agreeable to the bills, in respect of this service connections being raised on the basis the connected load furnished above, in case the actual consumption falls below the one stipulated by the tender conditions.

(Signature of the Contractor)

Name :

Address:

Date :

.....

**'C' CERTIFICATE BY THE CONTRACT CONTROL ENGINEER**

Verified the particulars and forwarded to the Engineer-in-charge.

(Signature of Contract control Engineer)

Name:

Section: Civil/Electrical/Mechanical.

.....

**'D' CERTIFICATE BY THE ENGINEER IN CHARGE**

Certified that the particulars furnished by the Contractor are true to the best of my knowledge and belief and that I have satisfied myself as to the safe conditions of electrical installations for which the service connection is applied for.

Signature :

Name:

Date:

Designation with section:

**'E' CERTIFICATE BY THE SAFETY ENGINEER**

Certified that I have inspected the electrical installations referred herein and after satisfying myself about the safe conditions of the installation, I hereby recommend that the service connection be given to the Contractor.

Signature of Safety Engineer.

Name:

Date:

.....

**'F' AUTHORIZATION BY THE ELECTRICAL ENGINEER**

Service connection may be/may not be given for the reasons noted hereunder.

Signature of Electrical Engineer.

Name:

Date:

Designation:

**‘G’ “REPORT OF COMPLIANCE”**

Service connection is given by me on

- |                      |                |
|----------------------|----------------|
| a) Meter Nos.        | 1.<br>2.<br>3. |
| b) Initial readings: | 1.<br>2.<br>3. |
| c) Locations:        | 1.<br>2.<br>3. |
| d) Meter sealings    |                |

Signature of Electrical Engineer  
(Metering and Billing)

Name:

Date:

Designation:

Note:

1 <sup>st</sup> copy to Contract Control Engineer	)	After all the formalities are completed
2 <sup>nd</sup> copy to Safety Engineer	)	and Report of Compliance in (G) are
and 3 <sup>rd</sup> copy to Electrical Engineer	)	filled up by the Electrical Engineer
		after power supply is given.

**IMPORTANT RULES OF ATOMIC ENERGY  
(FACTORIES) RULES, 1996  
APPLICABLE TO  
ENGINEERING, PROCUREMENT  
&  
CONSTRUCTION CONTRACTS**

**CHAPTER III**

**HEALTH**

**8. RECORD OF WHITEWASHING, ETC.- The record of dates on which whitewashing, colourwashing, varnishing, etc. are carried out shall be entered in a register maintained in a manner specified in Form 2.**

**9. CLEANLINESS OF WALLS, CEILINGS AND COMPOUND AREA.-**

(1) Clause (d) of sub-section (1) of section 11 of the Act shall not apply to the class or description of factories or parts of factories specified in the Table to this rule and subject to the condition that they are kept in a clean state by washing, sweeping, brushing, dusting, vacuum cleaning or other effective and adequate means:

Provided the said clause shall continue to apply-

- (a) as respects units/factories or parts of units/factories specified in part A of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 14.0 m<sup>3</sup>
- (b) as respects factories or parts of factories specified in part B of the said Table, to workrooms in which the amount of cubic space allowed for every person employed in the room is less than 70.0 m<sup>3</sup> ;
- (c) to engine-houses, fitting shops, lunchrooms, canteens, shelters, creches, cloakrooms, rest-rooms and wash places; and
- (d) to such parts of walls, sides and tops of passages and staircases as are less than 6 m. above the floor or stair.

(2) If it appears to the Competent Authority that any part of a factory, to which by virtue of sub-rule (1) any of the provisions of the said clause (d) do not apply or apply as modified by sub-rule (1), is not being kept in a clean state, it may, by written notice, require the occupier to whitewash or colourwash, wash, paint or varnish the same, and in the event of the occupier failing to comply with such requisition within two months from the date of the notice, sub-rule (1) shall cease to apply to such part of a factory, unless the Competent Authority otherwise determines.

**Rules 9-11**

- (3) The compound surrounding every factory shall be maintained in a sanitary and clean condition free of rubbish, filth or debris.

**TABLE**

## Part A

1. Chemical works.
2. The following parts of units/factories:-
  - (a) Rooms used only for storage of articles.
  - (b) Rooms in which the walls or ceilings consist of galvanised iron and/or asbestos cement sheets.
  - (c) Rooms in which graphite articles are manufactured / processed
  - (d) Parts of walls, partitions, ceilings or tops of rooms which are at least 6 m. above the floor.

## Part B

1. Electric generating or transforming stations.
  2. Engineering works.
  3. Foundries other than foundries in which brass casting is carried on.
- 10. DISPOSAL OF WASTES AND EFFLUENTS.-** The arrangements made in every factory after the treatment of wastes and effluents due to the manufacturing processes carried on therein shall be in accordance with those approved by the relevant Water and Air pollution Boards appointed under Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environmental Protection Act, 1986 and such other authorities as may be notified by the Central Government in this behalf.
- 11. ILLUMINATION, TEMPERATURE AND VENTILATION.-**
- (1) Illumination.-
    - (a) General : Adequate lighting is necessary for all buildings and in the open area so as to-
      - (i) promote work and other activities carried out in the area;
      - (ii) promote safety of the people; and
      - (iii) create a pleasing environment conducive for feeling of well-being.
    - (b) Adequate lighting will be achieved by,-

**Rules 11-11(Tab.)**

- (i) planning of brightness in relation to task itself, immediate background of the task and the general surrounding;
  - (ii) avoiding glare produced by excessive contrast or abrupt and large change in brightness; and
  - (iii) planning of lighting for movement about a building and around.
- (c) The recommended values of illumination for different locations is given in the Table below:

**TABLE**

<b>Sr.No.</b>	<b>Visual Tasks</b>	<b>Illumination (Lux)</b>
1.	Industrial Buildings & Process	
(a)	General Factory Areas -canteens, cloakrooms, entrances corridors, stairs	100-150
(b)	Factory- outside Areas -Stockyards, main entrances	20
(c)	Assembly, Inspection, Wood working, Welding & Soldering, Machine & Fitting Shops,	
(i)	Rough Work - Frame assembly	150
(ii)	Medium Work - Assembly of parts	300
(iii)	Fine Work - Electronic assembly, inspection	700
(iv)	Very Fine Work - Assembly of precision parts, optical aids to be provided.	1500
(v)	Very Precise Work	3000
(d)	Boiler Houses	
(i)	Coal & ash handling	100
(ii)	Boiler rooms-operating area	100
(iii)	Boiler rooms- other areas	20-50
(iv)	Outdoor plants	150

**Rule 11(Tab.)**

(e)	Chemical Works	
(i)	Hand furnace, boiling tanks, driers, evaporators etc.	150
(ii)	Controls, gauges, valves etc. (Supplementary lighting for viewing)	100
(iii)	Control rooms	200-300
(f)	Electricity Generating Station (indoor )	
(i)	Turbine halls	200
(ii)	Auxiliary equipment areas	100
(iii)	Boiler houses	70-100
(iv)	Boiler house & Turbine house	100
(v)	Basement areas	70
(vi)	Conveyer areas	70-100
(vii)	Control rooms	200-300
(viii)	Nuclear reactors & steam generating plants	150-200
(g)	Engraving	1000
(h)	Foundries	
(i)	Charging floors, tumbling etc.	150
(ii)	Fine moulding, core making & inspection	300
(iii)	Repairs	300
(i)	Garages	
(i)	Parking areas	70
(ii)	Washing, polishing etc.	150
(iii)	Repairs	300
(j)	Gauge & Tool room (Supplementary lighting if required)	700

**Rule 11(Tab.)**

(k)	Laboratories & Test Rooms	
	(i) General Labs & balance rooms	300
	(ii) Electronic & Instrument Labs	450
(l)	Laundries, Dry cleaning & ironing	200-300
(m)	Paint Shops & Spraying Booths	
	(i) Dipping, rubbing	150-300
	(ii) Fine painting & retouching	450-700
(n)	Plating Shops	
	(i) Vat & baths	150
	(ii) Final buffing & polishing	Special lighting
(o)	Structural Steel Fabrication Plants	
	(i) General	150
	(ii) Marking off	300
(p)	Libraries	
	(i) Shelves	70-150
	(ii) Reading rooms	150-700
	(iii) Cataloguing, sorting	150-300
	(iv) Book binding etc.	300-700
(q)	Offices	
	(i) Entrance & Reception	150
	(ii) Conference rooms & Gen. office	30
	(iii) Drawing offices	300-450
	(iv) Corridors & Lifts	70
	(v) Stairs, Lift landing	100-150
	(vi) Telephone exchanges	150-200

**Rule 11(Tab.)**

(r)	Hospitals		
	(i)	General & Wards	150
	(ii)	Operating Theatres General	300
	(iii)	Operation table	Special lighting
	(iv)	Laboratories	300
	(v)	Radiological rooms	100
	(vi)	Other areas	100-300
(s)	Restaurants		
	(i)	Dining room tables	100
	(ii)	Self service counters	300
	(iii)	Kitchen	200
	(iv)	Cloak room & toilets	100

- (2) Temperature.- It is essential to provide such temperature in work environment so that workers can be exposed to it repeatedly without adverse health effects. The nature of work can be light , moderate or heavy and the corresponding heat loads for the type of work are 200, 200-350 & 350-500 K Cal/hr. The heat stress is measured in terms of Wet Bulb Globe Temperature (WBGT) Index.\* (\* Note - on page 12)

The permissible WBGT index in degrees Celsius is given in the following WBGT Table.

**WBGT TABLE**

Work-Rest Regimen in each hour	Work Load		
	Light	Moderate	Heavy
Continuous Work	30.0	26.7	25.0
75% Work - 25% Rest	30.6	28.0	25.9
50% Work - 50% Rest	31.4	29.4	27.9
25% Work - 75% Rest	32.2	31.1	30.0

The Competent Authority shall specify the optimum working temperature & humidity and also the rest periods for specific factories & jobs.

**Rule 11(Tab.)**

- (3) Ventilation.- Ventilation shall be provided in buildings to supply fresh air for respiration & to dilute inside air to prevent vitiation by body odours & to remove any other products of combustion or other air contaminants. Contaminants from concentrated sources such as smoke, heat & fumes shall be collected separately by local exhaust ventilation. The recommended air changes per hour for various areas is given in the Table below:

**TABLE**

<b>Area</b>	<b>Air Changes/hour</b>
Factories	3 - 6
Dining Hall	12 - 15
Garages	12 - 15
Kitchen	6 - 9
Laboratories	3 - 6
Offices	3 - 6
Bathrooms & Toilets	6 - 12

Provided that the competent authority may relax the requirements regarding the number of air changes if it is satisfied that having regard to the location of the factory, orientation of the workroom, prevailing winds, roof height and the nature of manufacturing process carried on, sufficient supply of fresh air into the workroom is afforded during most part of the working time:

Provided further that in the regions where in summer (15th March-15th July) dry-bulb temperatures of outside air in the shade during most part of the day exceed 35 degrees Celsius and simultaneous wet-bulb temperatures are 25 degrees Celsius or below and in the opinion of the Inspector the manufacturing process carried on in the workroom of a factory permits thermal environments with relative humidity of 50% or more, the Inspector may serve on the manager of the factory an order to have sufficient supply of outside air for ventilation cooled by

\* (a) Outdoors with Solar load

$$WBGT = 0.7NWB + 0.2GT + 0.1DB$$

Where NWB = Natural Wet Bulb Temperature

DB = Dry Bulb Temperature

GT = Globe Thermometer Temperature

(b) Indoor or Outdoor without Solar load

$$WBGT = 0.7 NWB + 0.3GT$$

**Rules 11(Tab.)-16**

passing it through water sprays either by means of unit type of evaporative air coolers(desert coolers) or, where supply of outside air is provided by mechanical means through ducts in a plenum system, by means of central air washing plants.

- 12. QUANTITY OF DRINKING WATER.-** The quantity of drinking water to be provided per day for the workers in every factory shall be at least 5 litres per worker employed in the factory and such drinking water shall be readily available at all times during working hours.
  
- 13. SOURCE OF SUPPLY.- The water provided for drinking shall be supplied,-**
  - (a) from the public water supply system, or
  - (b) from any other source approved in writing by the local Health Officer concerned.
  
- 14. MEANS OF SUPPLY.-** If drinking water is not supplied directly from taps either connected with public water supply system or any other water supply system of the factory approved by the local Health Officer concerned, it shall be kept in suitable vessels, receptacles or tanks fitted with taps and having dust proof covers, and placed on raised stands or platforms in shade and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water renewed at least once every day. All practicable measures shall be taken to ensure that the water is free from contamination.
  
- 15. CLEANLINESS OF WELL OR RESERVOIR.-**
  - (1) Drinking water shall not be supplied from any open well or reservoir unless it is so constructed, situated, protected and maintained as to be free from the possibility of pollution by chemical, or bacterial and extraneous impurities.
  - (2) Where drinking water is supplied from such a well or reservoir, the water in it shall be sterilised once a week or more frequently if the inspector by written order so requires, and the date on which sterilising is carried out shall be recorded:  
  
Provided that this requirement shall not apply to any such well or reservoir if the water therein is filtered and treated to the satisfaction of the local Health Officer concerned before it is supplied for consumption.
  
- 16. REPORT FROM LOCAL HEALTH OFFICER CONCERNED.-** The Inspector may by order in writing direct the manager to obtain, at such time or at such intervals as he may direct, a report from the local Health Officer concerned as to the fitness for human

**Rules 16-18**

consumption of the water supplied to the workers, and to submit to the Inspector a copy of such report as soon as it is received from the local Health Officer.

**17. COOLING OF WATER.- In every factory wherein more than two hundred and fifty workers are ordinarily employed,-**

- (1) The drinking water supplied to the workers shall be cooled by an effective method for the period specified by the Inspector;
- (2) The cool drinking water shall be supplied in every canteen, lunchroom and rest-room and also at conveniently situated points throughout the factory which for the purpose of the rules shall be called "water centres";
- (3) The water centres shall be sheltered from the weather and adequately drained and shall be located outside the work-places where toxic materials are handled or processed;
- (4) The number of water centres to be provided shall be one "centre" for every 150 persons employed at any one time in the factory:

Provided that in the case of a factory where the number of persons employed exceeds 500 it shall be sufficient if there is one such "centre" as aforesaid for every 150 persons up to the first 500 and one for every 500 persons thereafter:

Provided further that its distance between the place of work shall be such as may be specified by the Inspector.

- (5) Every water centre shall be maintained in a clean and orderly condition; and
- (6) The means of supply of cooled drinking water shall be either directly through taps connected to water coolers or any other system for cooling of water, or by means of vessels, receptacles or tanks fitted with taps and having dust proof covers and placed on raised stands or platforms in shade, and having suitable arrangement of drainage to carry away the spilt water. Such vessels, receptacles or tanks shall be kept clean and the water refilled at least once every day.

**18. LATRINE ACCOMMODATION.- Latrine accommodation shall be provided in every factory on the following scale, namely:-**

- (a) where females are employed, there shall be at least one latrine for every 25 females;
- (b) where males are employed, there shall be at least one latrine for every 25 males;

**Rules 18-24**

Provided that where the number of males exceeds 100, it shall be sufficient if there is one latrine for every 25 males up to the first 100 males, and one for every 50 males thereafter.

Note:- In calculating the number of latrines required under this rule, any odd number of workers less than 25, or 50 as the case may be, shall be reckoned as 25 or 50.

19. **TOILET BLOCKS** .- The toilet block shall consist of wash basins, latrines and urinals (in case of male workers). The number of wash basins will be the same as number of latrines. Each wash basin shall be provided with mirror and liquid/cake soap. Each toilet block shall be provided with clean towel or electric hand drier. The number, size and location of the toilet block shall be as per the decision of Inspector & Public Health Authority.
20. **PRIVACY OF TOILET**.- Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings, which shall be maintained in good working order at all time.
21. **SIGN BOARDS TO BE DISPLAYED**.- Where workers of both sexes are employed, there shall be displayed outside each latrine block a notice "For Men Only" or "For Women Only" as the case may be, in the language understood by the majority of the workers. The notice shall also bear the figures of a man or of a woman as the case may be.
22. **URINAL ACCOMMODATION**.- Urinal accommodation shall be provided for the use of male workers and there shall be at least one urinal for every 50 males:  
  
Provided that where the number of males employed exceeds 500, it shall be sufficient if there is one urinal for every 50 males up to the first 500 employed, and one for every 100 thereafter.  
  
Note:- In calculating the urinal accommodation required under this rule any odd number of workers less than 50, or 100, as the case may be, shall be reckoned as 50 or 100.
23. **URINALS TO CONFORM TO PUBLIC HEALTH REQUIREMENTS**.- Urinals other than those connected with an efficient water-borne sewage system, and urinals in a factory wherein more than two hundred and fifty workers are ordinarily employed shall comply with the requirements of the Public Health Authorities.
24. **CERTAIN LATRINES AND URINALS TO BE CONNECTED TO SEWERAGE SYSTEM**.- When any general system of underground sewerage with an assured water supply for any particular locality is provided in a municipality, all latrines and urinals of a factory situated in

**Rules 24-29**

such locality shall, if the factory is situated within 30 metres of an existing sewer, be connected with that sewerage system suitably.

- 25. WHITEWASHING, COLOURWASHING OF LATRINES AND URINALS.-** The walls, ceilings and partitions of every latrine and urinal shall be whitewashed or colourwashed and the whitewashing or colourwashing shall be repeated at least once in a period of four months. The dates on which the whitewashing or colourwashing is carried out shall be entered in the prescribed register (Form 2):

Provided that this rule shall not apply to latrines and urinals, the walls, ceilings or partitions of which are laid in glazed tiles or otherwise finished to provide a smooth, polished, impervious surface and that they are washed with suitable detergents and disinfectants at least once in every period of four months.

- 26. CONSTRUCTION AND MAINTENANCE OF DRAINS.-** All drains carrying waste or sullage water shall be constructed in masonry or other impermeable material and shall be regularly flushed and the effluent disposed of by connecting such drains with a suitable drainage line:

Provided that where there is no such drainage line, the effluent shall be deodorized and rendered innocuous and then disposed of in a manner suitable to the satisfaction of the local Health Officer concerned.

- 27. WATER TAPS IN LATRINES.-** Where piped water supply is available, a sufficient number of water taps, conveniently accessible, shall be provided in or near latrine accommodation. A tap per each latrine is to be preferred. There shall be at least one tap for every ten latrines or part thereof. The water taps shall be connected to the Municipal water supply or to an overhead storage tank of sufficient capacity, so that water is available from the taps during all hours when the workers are in the factory. Wherever commode type of latrines are provided arrangements shall be made for providing toilet paper and soap solution, in addition to the water tap. The toilet paper and soap solution shall be regularly replenished.

- 28. NUMBER AND LOCATION OF SPITTOONS.-** The number and location of the spittoons to be provided shall be to the satisfaction of the Inspector. Such spittoons shall be placed on a stand or a bracket 90 cm. high.

- 29. TYPE OF SPITTOONS.-** The spittoons shall be of either of the following types, namely:-

- (a) a galvanized iron container with a conical funnel-shaped cover. A layer of suitable disinfectant liquid shall always be

**Rules 29-31(Sch.)**

maintained in the container; or

- (b) a container filled with dry clean sand, and covered with a layer of bleaching powder; or
- (c) any other type approved by the Competent Authority.

**30. CLEANING OF LATRINES, URINALS, WORKPLACES & SPITTOONS.-**

Latrines, urinals, washplaces & spittoons shall be maintained in clean & sanitary conditions by employing adequate number of sanitary staff.

**31. Qualifications of competent person with reference to various Sections of the Act are given in the schedule below.****SCHEDULE**

The Competent Person is a person who is having a degree in the discipline mentioned or equivalent followed by experience as specified, in responsible position in the field and designated by the Competent Authority.

Sl. No.	Rules made under section of the Act requiring competency	Type of work	Discipline	Experience
1	2	3	4	5
1.	Section(6)	Civil construction structural work.	Civil or structural engineering	& Minimum 10 yrs in design, construction testing or repairs of structures, knowledge of various codes pertaining to the non destructive testing methods.
2.	Section21(2)	Operation of dangerous machines	Electrical mechanical engineering equivalent	or Minimum 7 yrs in design, operation or maintenance, testing of relevant machinery, guards, safety devices etc.
3.	Section 28	Lifts & Hoists	- do -	Min. 7 yrs. in design, erection maintenance, inspection and test procedures of Hoists & lifts.

**Rule 31(Sch.)**

1	2	3	4	5
4.	Section 29	Lifting Machinery Lifting tackles	Electrical, Mechanical Metallurgical	Min.7 yrs. in design, erection maintenance, inspection. testing of lifting machinery or lifting tackle
5.	Section 31	Pressure plant	Chemical, Electrical mechanical metallurgical Engineering equivalent	Min. 10 yrs experience in design, erection, maintenance, testing examination, inspection of pressure plants and knowledge of non destructive testing & codes of safety requirement of pressure vessels.
6.	Section 36	Dangerous fumes	Chemical engineering or masters degree in chemistry	Min.7 yrs. experience in collection and analysis of environmental samples and calibration of monitoring equipment.
7.	Section 41-C (b)	Supervision of handling of hazardous substances	Chemical engineering or masters degree in chemistry	Min. 7 yrs. experience on the shop floor in handling & disposal of hazardous chemicals.
8.	Section 87	Ventilation system	Electrical or mechanical engg.	Min.7 yrs. in design, fabrication, installation, testing of ventilation systems and systems used for collection of dusts, fumes etc.

**CHAPTER IV**

**SAFETY**

- 32. Without prejudice to the provisions of sub-section (1) of section 21 of the Act in regard to fencing , the further precautions specified in Schedules annexed here to shall apply to machines mentioned in each Schedule.**

**SCHEDULE I**

**WOODWORKING MACHINERY**

1. Definitions.-For the purposes of this schedule -
  - (a) "woodworking machine" means a circular saw, band saw, planing machine, chain mortising machine or vertical spindle moulding machine operating on wood or cork;
  - (b) "circular saw" means a circular saw working in a bench (including a rack bench), but does not include a pendulum or similar saw which is moved towards the wood for the purpose of cutting operation;
  - (c) "band saw" means a band saw, the cutting portion of which runs in a vertical direction but does not include a log saw or band re-sawing machine; and
  - (d) "planing machine" means a machine for overhead planing or for thicknessing or for both operations.
2. Stopping and starting device.- An efficient stopping and starting device shall be provided on every woodworking machine. The control of this device shall be in such a position as to be readily and conveniently operated by the person in charge of the machine.
3. Space around machines.- The space surrounding every woodworking machine in motion shall be kept free from obstruction.
4. Floors.-The floor surrounding every woodworking machine shall be maintained in good and smooth condition, and shall not be allowed to become slippery, and as far as practicable shall be kept free from chips or other loosely scattered material.
5. Training and supervision.-
  - (a) No person shall be employed at a woodworking machine unless he has been sufficiently trained to work that class of machine, or unless he works under the adequate supervision of a person who has a thorough knowledge of the working of the machine.

**Rule 32 (Sch)**

- (b) A person who is being trained to work a woodworking machine shall be fully and carefully instructed as to the dangers of the machine and the precautions to be observed to secure safe working of the machine.
6. Circular saws.-Every circular saw shall be fenced as follows:-
- (a) behind and in direct line with the saw there shall be a riving knife, which shall have a smooth surface, shall be strong, rigid and easily adjustable, and shall also conform to the following conditions:-
    - (i) the edge of the knife nearer the saw shall form an arc of a circle having a radius not exceeding the radius of the largest saw used on the bench;
    - (ii) the knife shall be maintained as close as practicable to the saw, having regard to the nature of the work being done at the time, and at the level of the bench table. The distance between the front edge of the knife and the teeth of the saw shall not exceed 12 millimeters; and
    - (iii) for a saw of a diameter of less than 60 cm., the knife shall extend upwards from the bench table to within 25 mm. of the top of the saw, and for a saw of a diameter 60 cm. or over shall extend upwards from the bench table to a height of at least 23 cm.
  - (b) the top of the saw shall be covered by a strong and easily adjustable guard, with a flange at the side of the saw farthest from the fence. The guard shall be kept so adjusted that the said flange shall extend below the roots of the teeth of the saw. The guard shall extend from the top of the riving knife to a point as low as practicable at the cutting edge of the saw; and
  - (c) the part of the saw below the bench table shall be protected by two plates of metal or other suitable material, one on each side of the saw; such plates shall not be more than 15 cm. apart, and shall extend from the axis of the saw outwards to a distance of not less than 5 cm. beyond the teeth of the saw. Metal plates, if not beaded, shall be of a thickness of at least 2.5 mm., or if beaded, be of a thickness of at least 1.25 mm.
7. Push Sticks.-A push stick or other suitable appliance shall be provided for use at every circular saw and at every vertical spindle moulding machine to enable the work to be done without unnecessary risk.
8. Band saws.-Every band saw shall be guarded as follows:-
- (a) both sides of the bottom pulley shall be completely encased by sheet or expanded metal or other suitable material;

**Rule 32 (Sch.I-II)**

- (b) the front of the top pulley shall be covered with sheet or expanded metal or other suitable material; and
  - (c) all portions of the blade shall be enclosed or otherwise securely guarded, except the portion of the blade between the bench table and the top guide.
9. Planing machines.-
- (a) A planing machine (other than a planing machine which is mechanically fed) shall not be used for overhand planing unless it is fitted with a cylindrical cutter block.
  - (b) Every planing machine used for overhand planing shall be provided with a "bridge" guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjusted both in a vertical and horizontal direction.
  - (c) The feed roller of every planing machine used for thicknessing, except the combined machine for overhand planing and thicknessing, shall be provided with an efficient guard.
10. Adjustment and maintenance of guards.-The guards and other appliances required under this schedule shall be -
- (a) maintained in an efficient state;
  - (b) constantly kept in position while the machinery is in motion; and
  - (c) so adjusted as to enable the work to be done without unnecessary risk.
11. Exemptions.-Paragraphs 6, 8, 9 and 10 shall not apply to any woodworking machine in respect of which it can be proved that other safeguards are provided, maintained and used which render the machine as safe as it would be if guarded in the manner prescribed in this schedule.

**SCHEDULE II**

**CENTRIFUGAL MACHINES**

1. Definition.-"Centrifugal machines" include centrifugal extractors, separators and driers.
2. Every part of centrifugal machine shall be
  - (a) of good design and construction and of adequate strength;
  - (b) properly maintained; and

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- (c) examined thoroughly by a competent person at regular intervals to check for unbalance & in case unbalance at high speeds is observed steps to restore the balance shall be taken before commissioning the machine.
3. Interlocking guard for drum or basket.-
    - (a) The cage housing the rotating drum or basket of every centrifugal machine shall be provided with a strong lid. The design and construction of the cage as well as the lid shall be such that no access is possible to the drum or basket when the lid is closed.
    - (b) Every centrifugal machine shall be provided with an efficient interlocking device that will effectively prevent the lid referred to in sub-paragraph (a) from being opened while the drum or basket is in motion and prevent the drum or basket being set in motion while the lid is in the open position.
  4. Braking arrangement.-Every centrifugal machine shall be provided with an effective braking arrangement capable of bringing the drum or basket to rest within as short a period of time as reasonably practicable after the power is cut off.
  5. Operating speed.-No centrifugal machine shall be operated at a speed in excess of the manufacturer's rating which shall be legibly stamped at easily visible places both on the inside of the basket and on the outside of the machine casing.

**SCHEDULE III**

**POWER PRESS**

1. Application.- The Schedule shall apply to all types of power presses including press brakes, except when used for working hot metal.
2. Definition.- For the purpose of this Schedule -
  - (a) "approved" means approved by the Competent Authority;
  - (b) "fixed fencing" means fencing provided for the tools of a power press being fencing which has no moving parts associated with or dependent upon the mechanism of a power press and includes that part of a closed tool which acts as a guard;
  - (c) "power press" means a machine used in metal or other industries for moulding, pressing, blanking raising drawing and similar purposes;
  - (d) "safety device" means the fencing and any other safeguard provided for the tools of a power press.
3. Starting and stopping mechanism.- The starting and stopping mechanism shall be provided with a safety stop so as to prevent

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over running of the press or descent of the ram during tool setting, etc.

4. Protection of tool and die.-

- (a) Each press shall be provided with a fixed guard with a slip plate on the underside enclosing the front and sides of the tool.
- (b) Each die shall be provided with a fixed guard surrounding its front and sides, and extending to the back in the form of a tunnel through which the pressed article falls to the rear of the press.
- (c) The design, construction and mutual position of the guards referred to in (a) and (b) such as to preclude the possibility of the worker's hand or fingers approaching the danger zone.
- (d) The machine shall be fed through a small aperture at the bottom of the die guard, but a wider aperture may be permitted for second or subsequent operations if feeding is done through a chute.
- (e) Notwithstanding anything contained in sub-clauses (a) and (b) an automatic or an inter-locked guard may be used in place of a fixed guard, but where such guards are used they shall be maintained in an efficient working condition and if any guard develops a defect, the power press shall not be operated unless the defect of the guard is removed.

5. Appointment of persons to prepare power presses for use .-

- (a) Except as provided in paragraph (4), no person shall set, re-set, adjust or try out the tools on a power press or install or adjust any safety device thereon, being installation or adjustment preparatory to production of die proving, or carry out an inspection and test of any safety device thereon required by paragraph 8 unless he-
  - (i) has attained the age of eighteen;
  - (ii) has been trained in accordance with the sub-paragraph (b); and
  - (iii) has been appointed by the occupier of the factory to carry out those duties in respect of the class or description of power press or the class or description of safety device to which the power press or the safety device (as the case may be) belongs; and the name of every such person shall be entered in a register in Form 1.

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- (b) The training shall include suitable and sufficient practical instruction in the matters in relation to each type of power press & safety device in respect of which it is proposed to appoint the person being trained.
6. Examination and testing of power presses and safety devices.-
- (a) No power press or safety device shall be taken into use in any factory for the first time in that factory, or in case of a safety device for the first time on any power press, unless it has been thoroughly examined and tested, in the case of a power press, after installation in the factory, or in the case of a safety device, when in position on the power press in connection with which it is to be used.
  - (b) No power press shall be used unless it has been thoroughly examined and tested by a competent person within the immediately preceding period of 12 months.
  - (c) No power press shall be used unless every safety device (other than fixed fencing) thereon has within the immediately preceding period of six months when in position on that power press, been thoroughly examined and tested by a competent person.
  - (d) The competent person carrying out an examination and test under the foregoing provisions shall make a report of the examination and test containing the following particulars and every such report shall be kept readily available for inspection:
    - (i) name of the occupier of the factory;
    - (ii) address of the factory;
    - (iii) identification number or mark sufficient to identify the power press or the safety device;
    - (iv) date on which the power press or the safety device was first taken into use in the factory;
    - (v) the date of each periodical thorough examination carried out as per requirements of sub-paragraph (b) above;
    - (vi) particulars of any defects affecting the safe working of the power press or the safety device found at any such thorough examination and steps taken to remedy such defects;

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7. Defects disclosed during a thorough examination and tests .-

- (a) Where any defect is disclosed in any power press or in any safety device by any examination and test under paragraph 6 and in the opinion of the competent person carrying out the examination and test, either-
  - (i) the said defect is a cause of danger to workers and in consequence the power press or safety device (as the case may be ) ought not to be used until the said defect has been remedied; or
  - (ii) the said defect may become a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used after the expiration of a specified period unless the said defect has been remedied.

Such defect shall, as soon as possible after the completion of the examination and test, be notified in writing by the competent person to the occupier of the factory and, in the case of a defect falling within clause (ii) of this sub-paragraph such notification shall include the period within which, in the opinion of the competent person, the defect ought to be remedied.

- (b) In every case where notification has been given under this paragraph, a copy of the report made under paragraph 6(d) shall be sent by the competent person to the inspector for the area within fourteen days of the completion of the examination and test.
- (c) Where any such defect is notified to the occupier in accordance with the foregoing provisions of this paragraph the power press or safety device (as the case may be ) having the said defect shall not be used -
  - (i) in the case of a defect falling within clause(i) of sub- paragraph (a) until the said defect has been remedied; and
  - (ii) in the case of defect falling within clause (ii) of sub-paragraph (a), after the expiration of the specified period.
- (d) As soon as is practicable after any defect of which notification has been given under sub-paragraph(a) has been remedied, a record shall be made by or on behalf of the occupier stating the measures by which and the date on which the defect was remedied.

8. Inspection and test of safety devices.-

- (a) No power press shall be used after the setting, resetting or adjustment of the

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tools thereon unless a person appointed or authorised for the purpose under Paragraph 5 has inspected and tested every safety device thereon while it is in position on the said power press:

Provided that any inspection, test and certificate as aforesaid not be required where any adjustment of the tools has not caused or resulted in any alteration to or disturbance of any safety device on the power press and if, after the adjustment of the tools, the safety devices remain, in the opinion of such a person as aforesaid, in efficient working order.

- (b) Every power press and every safety device thereon while it is in position on the said power press shall be inspected and tested by a trained person every day.
9. Defects disclosed during an inspection and test.-
- (a) Where it appears to any person as a result of any inspection and test carried out by him under paragraph 8 that any necessary safety device is not in position or is not properly in position on a power press or that any safety device which is in position on a power press is not in his opinion suitable, he shall notify the manager forthwith.
  - (b) Except as provided in sub-paragraph (c) where any defect is disclosed in a safety device by any inspection and test under paragraph 8, the person carrying out the inspection and test shall notify the manager forthwith.
  - (c) Where any defect in a safety device is the subject of a notification in writing under paragraph 7 by virtue of which the use of the safety device may be continued during a specified period without the said defect having been remedied, the requirement in sub-paragraph (b) of this paragraph shall not apply to the said defect until the said period has expired.
10. Identification of power presses and safety devices.- For the purpose of identification every power press and every safety device provided for the same shall be distinctively and plainly marked.
11. Training and instructions to operators.- The operators shall be trained and instructed in the safe method of work before starting work on any power press. It shall be ensured by adequate supervision that correct operating procedures are being followed.
12. Exemptions.-
- (a) If in respect of any factory, the Competent Authority is satisfied that owing to the circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this Schedule are not necessary for the

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protection of the workers employed on any power press or any class or description of power press or in the factory, the Competent Authority by a certificate in writing(which he may in his discretion revoke at any time), exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.

- (b) Where such exemption is granted, a legible copy of the certificate, showing the conditions (if any) subject to which it has been granted, shall be kept posted in the factory in a position where it may be conveniently read by the persons employed.

**SCHEDULE IV**

**WELDING AND GAS CUTTING**

1. Arc Welding.-

- (a) Definition.- Arc welding is a welding process wherein coalescence is produced by heating with an electric arc, with or without application of pressure and with or without the use of filler metal.
- (b) Correct and proper electric earthing shall be provided for the welding machine, the casing and the job to be welded. These shall be electrically checked for any leakage of current by an authorised and trained electrician.
- (c) The welding machine shall be kept at a dry place and materials shall not be kept around it.
- (d) The welding cable shall be in good condition. The metal wire shall not be in an exposed state anywhere. The welding cable connections shall be tight. The cable shall not lie on wet surface nor shall it pass through water. Building structure, fuel tanks, railings etc., shall not be used to support welding cables. As far as possible cable shall not be laid across the passages.
- (e) The welder shall not wear any wet dresses, footwear, hand gloves etc. These articles must be dry before working with welding machines. The welder shall wear rubber shoes, hand gloves and use welding screens while doing welding jobs. Welding screen shall be used around the welding area to stop welding flashes from affecting others. The welder must check the welding holder thoroughly before starting the job and shall also see that the insulation of the holder is proper.
- (f) The welding cable and holder etc., shall be fastened to the overhead structures with non-conductors to prevent these from dropping down.

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- (g) Scaffolding made of corrugated sheets shall be used below the areas where welding is to be done to prevent sparks dropping down below.
- (h) While welding in confined areas like inside of tanks, pipes etc., proper ventilation shall be provided with the help of a fan.
- (i) Welding on a gas or fuel line shall never be done without a special approved procedure written specially for the particular job.
- (j) All welding work shall be started only after obtaining a welding permit from authorised agency indicating special precautions including the fire fighting details.
- (k) For welding work on overhead equipment such as crane etc. a separate earth cable shall be run up to the work place and shall be connected to work piece.

2. Gas Cutting.-

- (a) Definition.- Gas cutting is a process used for cutting mild steel by a flame torch using compressed gases Hydrogen/Acetylene and oxygen to preheat the metal and cutting it by forcing oxygen at higher pressure.
- (b) The gas cylinders shall be kept well away from any fire or hot areas. The rubber pipes, joints, gas torches, valve connections shall be thoroughly checked for leakage of gas.
- (c) The gas cutter shall use proper safety appliances viz. gas cutters goggles, hand gloves, safety shoes, helmets and safety belts.
- (d) The rubber hose shall not come in contact with any hot material and it shall not be taken through hot areas.
- (e) The gas torch shall be fastened to a fixed overhead structural or with the body of the gas cutter to stop it from dropping down.
- (f) The rubber hose shall not obstruct the movement of others. When necessary to lower the rubber hose with fittings, a fibre rope should be used. A metal sheet shall be used below the job to arrest any sparks/hot slags from falling down.
- (g) Before starting any gas cutting, a written permit clearance shall be obtained from authorised person which will indicate all Safety precautions including fire fighting details.
- (h) Gas cutting at or near fuel line/hazardous area etc., shall be done only after obtaining a special approved procedure for that job.
- (i) Provisions of Gas Cylinder Rules shall be complied with.

**Rule 32 (Sch.V)**

**SCHEDULE V**

**SHEARS, SLITTERS AND GUILLOTINE MACHINES**

1. Definition.- For the purpose of this Schedule -
  - (a) "guillotine" means a machine ordinarily equipped with straight, bevel-edged blade operating vertically against a stationery resisting edge and used for cutting metallic or non- metallic substances;
  - (b) "shears" or "shearing machine" means a machine ordinarily equipped with straight, bevel-edged blades operating vertically against resisting edges, or with rotary, overlapping cutting wheels, and used for shearing metals or non-metallic substances; and
  - (c) "slitter" or "slitting machine" means a machine ordinarily equipped with circular disc-type knives, and used for trimming or cutting into metal or non-metallic substances or for slitting them into narrow strips; for the purpose of this Schedule, this term includes bread or other food slicers equipped with rotary knives or cutting discs.
  
2. Guillotine and Shears.-
  - (a) Where practicable, a barrier metal guard of adequate strength shall be provided at the front of the knife, fastened to the machine frame and shall be so fixed as would prevent any part of the operator's body to reach the descending blade from above, below or through the barrier guard or from the sides:

Provided that in case of machines used in the paper printing and allied industries, where a fixed barrier metal guard is not suitable on account of the height and volume of the material being fed, there shall be provided suitable starting devices which require simultaneous action of both the hands of the operator or an automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade.
  - (b) At the back end of such machines, an inclined guard shall be provided over which the slit pieces would slide and be collected at a safe distance in a manner as would prevent a person at the back from reaching the descending blade.
  - (c) Power-driven guillotine cutters, except continuous feed trimmers, shall be equipped with -
    - (i) starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or

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- (ii) an automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the non-starting position after each complete cycle of the knife.
  - (d) Where two or more workers are employed at the same time on the same power-driven guillotine cutter equipped with two-hand control the device shall be so arranged that each worker shall be required to use both hands simultaneously on the safety trip to start the cutting motion, and at least one hand on a control to complete the cut.
  - (e) Power-driven guillotine cutters, other than continuous trimmer, shall be provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position.
3. Slitting Machines.-
- (a) Circular disc-type knives on machines for cutting metal and leather, paper, rubber, textiles or other non-metallic substances shall, if within reach of operators standing on the floor or working level, be provided with guards enclosing the knife edges at all times as near as practicable to the surface of the material, and which may either-
    - (i) automatically adjust themselves to the thickness of the material; or
    - (ii) be fixed or manually adjusted so that the space between the bottom of the guard and the material will not exceed 6 mm (1/4 in.) at any time.
  - (b) Portions of blades underneath the tables or benches of slitting machines shall be covered by guards.
4. Index Cutters and Vertical Paper Slotters.- Index cutters, and other machines for cutting strips from the ends of books, and for similar operations, shall be provided with fixed guards, so arranged that the fingers of the operators cannot come between the blades and the tables.
5. Corner Cutters.- Corner cutters, used in the manufacture of paper boxes, shall be equipped with -
- (a) suitable guard fastened to the machines in front of the knives and provided with slots or perforations to afford visibility of the operations; or
  - (b) other guards equally efficient for the protection of the fingers of the workers.

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6. Band Knives.- Band wheels on band knives, and all portions of the blades except the working side between the sliding guide and the table on vertical machines, or between the wheel guards on horizontal machines, shall be completely enclosed with hinged guards of sheet metal not less than 1 mm(0.04 in) in thickness or of other material of equal strength.

**SCHEDULE VI**

**AGITATORS AND MIXING MACHINES**

1. Definition.- "Agitators and Mixing Machines" means a tank or other container equipped with power-driven mixing arms, blades or paddle wheels fixed to revolvable shafts or other simple mechanical devices for blending stirring liquids with other liquids or with solid substances or combinations of these.
2. When the top of an open agitator tank, beater tank or paddle tank or similar vessel is less than 1 M above the adjacent floor or working level, adequate standard railings shall be installed on all open sides.
3. Agitators and mixing machines shall be provided with an efficient inter-lock arrangement for the top lid, to prevent access to the agitating, stirring or similar devices, whilst in motion and would prevent restart under power with the lids in open position.
4. When other inspection or examination openings are provided at the top or sides of the containers vessels of the agitator and mixing machines, such openings shall be provided with standard grill guards as would prevent access of any part of the operator's body coming in contact with agitator stirring or similar devices whilst in motion.
5. When discharge holes, openings, chutes or similar arrangements are provided at bottom or at the sides of the container vessels of the agitator and mixing machines, they shall, be so designed, shaped guarded, or situated as would prevent access of any part of operator's body coming in contact with agitating, stirring or similar devices, whilst in motion inside the vessel.

**Rule 32 (Sch. -VII)**

**SCHEDULE VII**

**CONVEYORS**

1. Application.- The schedule shall apply to all types of conveyors.
2. Definition.- Conveyor means a horizontal, inclined or vertical device for moving or transporting bulk materials, packages & objects in a path predetermined by the design of device and having points of loading or discharge fixed or selective.
3. General.- The conveyors shall be so designed installed, operated & maintained as per the national code & standards. Safe procedures shall be laid down to include the following, namely:-
  - (a) All moving parts of conveyors such as gears, sprockets, sheaves etc. shall be guarded;
  - (b) The starting switch of conveyor shall be located at such a place so that the operator shall have clear view of the entire conveyor length;
  - (c) The entire system shall be so interlocked by electrical or mechanical means that it can stop automatically if there is a blockage at any place along the length;
  - (d) Conveyors operating in series shall have controls so designed that if one of the conveyor stops others shall automatically stop;
  - (e) Electrical machines operating the conveyors equipped with brakes which are mechanically applied or released by movement of operating device, shall be so designed that if the electrical power is interrupted with brakes in OFF position, load can descend only at controlled speed;
  - (f) Antirunaway or backstop devices shall be provided on reversible type of conveyors where reversing can cause hazard;
  - (g) Overload protecting devices shall be provided on conveyors which shall disconnect the electrical power. All restarting devices shall remain locked till the cause of overload is removed;
  - (h) For conveyors feeding the hopper at or near level of floor, the hopper shall be provided with screen or railing and toe-board;
  - (i) Conveyors handling flammable material or fine powders shall have only explosion proof electrical fixtures. The dust levels in the area shall be restricted to PLE Limits by suitable means; and
  - (j) Conveyors running in tunnels & pits shall have sufficient clearance at sides for workers engaged in lubricating or repair works.
4. Conveyors at height.-
  - (a) Conveyors at elevated locations shall be provided with access platform with toe-board & guard rails.

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- (b) Conveyors installed within 2 metres of floor or walkway surface shall be provided with crossovers or passages
  - (c) Overhead conveyors shall be provided with sideboards along the edges & screen guards underneath. Underpasses shall be provided with sheet metal ceiling for protection of the persons crossing.
  - (d) Conveyors passing through building floors, walls shall have interlocks installed in such a way that all will have to operate at one time to start the system. These switches shall be clearly marked & area near them shall be kept clean and free of obstructions. The openings shall be guarded with hand rails, toe-boards etc.
5. Maintenance.- The operation, maintenance of conveyors shall be done under work permit system keeping in mind the nature of materials handled. The entire mechanism of conveyors, electrical switches, interlocks etc. shall be inspected and maintained regularly especially for brakes, back stops, anti-runaway devices, overload releases and such other safety devices.
6. Fire Fighting.- The entire length of the conveyor shall be covered by installation of fire detection and warning system. Wherever conveyor passes through wall or floor openings, automatic system shall be installed for closing of them to stop the passage of flame through them. Wherever necessary automatic water sprinkler system shall also be provided.
- 33. Register of workers employed for work on or near machinery in motion.-In every factory a register shall be maintained in Form 1 in which the name and other particulars of every such worker as may be employed for such examination or operation as referred to in the proviso to sub-section (1) of section 21 shall be entered.**
- 34. HOISTS AND LIFTS.-**
- (1) A register shall be maintained to record particulars of examination of hoists and lifts and shall give particulars as shown in Form 3.
  - (2) In pursuance of the provisions of sub-section (4) of Section 28, in respect of any class or description of hoist or lift specified in the first column of the following Schedule, the requirements of section 28 specified in the second column of the said Schedule and set opposite to that class or description of hoist or lift shall not apply.

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<b><u>Class or description of hoist or lift</u></b>	<b><u>Requirements which shall not apply</u></b>
Hoists or lifts mainly used for raising materials for charging blast furnaces or lime kilns.	Sub-section 1(b) in so far as it requires a gate at the bottom landing; sub-section 1(d); sub-section 1(e)
Hoists not connected with mechanical power and which are not used for carrying persons.	Sub-section 1(b) in so far as it requires the hoistway or liftway enclosure to be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part; sub-section 1(e)

**35. LIFTING MACHINES, CHAINS, ROPES AND LIFTING TACKLES.-**

- (1) No lifting machine and no chain, rope or lifting tackle, except a fibre rope or fibre rope sling, shall be taken into use in any factory for the first time in that factory unless it has been tested and all parts have been thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load or loads and signed by the person making the test and the examination, has been obtained and is kept available for inspection.
- (2) Every jib-crane so constructed that the safe working load may be varied by the raising or lowering of the jib, shall have attached there to either an automatic indicator of safe working loads or an automatic jib angle indicator and a table indicating the safe working load at corresponding inclinations of the jib or corresponding radii of the load. An audio-visual alarm be preferably provided in addition, to give alarm wherever the limits given in table are exceeded.
- (3) A table showing the safe working loads of every kind and size of chain, rope or use, and, in the lifting tackle in case of a multiple sling, the safe working loads at different angles of the legs, shall be pasted in the store in which the chains, ropes or lifting tackles are kept, and in prominent positions on the premises, and no chain, rope or lifting tackle not shown in the table shall be used:

Provided that this sub-rule shall not apply in respect of such lifting tackle if the safe working load thereof, or in the case of a multiple sling, the safe working load at different angles of the legs, is plainly marked upon it.

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- (4) The register to be maintained under clause (a)(iii) of sub-section (1) of Section 29 of the Act shall contain the report as given in Form - 4, giving following particulars and shall be kept readily available for inspection:-
- (a) Name of occupier of factory.
  - (b) Address of factory.
  - (c) Distinguishing number or mark, if any, and description sufficient to identify the lifting machine, chain, rope, or the lifting tackle.
  - (d) Date when the lifting machine, chain, rope or lifting tackle was first taken into use in the factory.
  - (e) Date and number of the certificate relating to any test and examination made under sub-rules (1) and (15) together with the name and address of the person who issued the certificate.
  - (f) Date of each periodical thorough examination made under clause (a) (iii) of sub-section(1) of Section 29 of the Act and sub-section (3) and by whom it was carried out.
  - (g) Date of annealing or other heat treatment of the chain and other lifting tackle made under sub-rule (7) and by whom it was carried out.
  - (h) Particulars of any defects affecting the safe working load found at any such thorough examination or after annealing and of the steps taken to remedy such defects.
- (5) All rails on which a travelling crane moves and every track on which the carriage of a transporter or runway moves shall be of proper size and adequate strength and have an even running surface; and every such rail or track shall be properly laid, adequately supported and properly maintained.
- (6) To provide access to rail tracks of overhead travelling cranes suitable passage-ways of at least 50 centimeters width with toeboards and double hand rails 90 centimeters high shall be provided alongside, and clear of, the rail tracks of overhead travelling cranes, such that no moving part of the crane can strike persons on the ways, and the passage-way shall be at a lower level than the crane track itself. Safe access ladders shall be provided at suitable intervals to afford access to these passage-ways, and from passage-ways to the rail tracks:
- Provided that the Competent Authority may, for reasons to be specified in writing, exempt any factory in respect of any overhead travelling crane from the operation of any provision of this sub-rule subject to such conditions as it may specify.
- (7) All chains and lifting tackles except a rope sling shall, unless they have been subjected to such other heat treatment as may be approved by the Competent Authority of Factories, be effectively annealed under the supervision of a competent person at the following intervals:-

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- (a) all chains, slings, rings, hooks, shackles and swivels used in connection with molten metal or molten slag or when they are made of 12.5 millimeters bar or smaller, once at least in every six months; and
- (b) all other chains, rings, hooks, shackles and swivels in general use, once at least in every twelve months:

Provided that chains and lifting tackle not in frequent use shall, subject to the Competent Authority's approval, be annealed only when necessary. Particulars of such annealing shall be entered in a register prescribed under sub-rule (4).

- (c) Slings-
  - (i) Chains shall not be joined by bolting or wiring links together. They shall not be shortened by tying knots. A chain in which the links are locked, stretched or do not move freely shall not be used. The chain shall be free of kinks and twists. Proper eye splices shall be used to attach the chain hooks.
  - (ii) Pulley blocks of the proper size shall be used to allow the rope free play in the sheave grooves and to protect the wire rope from sharp bends under load. Idle sling shall not be carried on the crane hook along with a loaded sling. When idle slings are carried they shall be hooked.
  - (iii) While using multilegged slings, each sling or leg shall be loaded evenly and the slings shall be of sufficient length to avoid a wide angle between the legs.
  - (iv) Sling hitches on loads shall be made under the supervision of experienced persons.

(8) Nothing in the foregoing sub-rule (7) shall apply to the following classes of chains and lifting tackles, namely:-

- (a) chains made of malleable cast iron;
- (b) plate link chains;
- (c) chains, rings, hooks, shackles and swivels made of steel or of any non-ferrous metal;
- (d) pitched chains, working on sprocket or pocketed wheels;
- (e) rings, hooks, shackles and swivels permanently attached to pitched chains, pulley blocks or weighing machines;
- (f) hooks and swivels having screw threaded parts or ball bearing or other case hardened parts;
- (g) socket shackles secured to wire ropes by white-metal capping; and
- (h) bordeaux connections:

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Provided that such chains and lifting tackles shall be thoroughly examined by a competent person once at least in every twelve months, and particulars entered in the register kept in accordance with sub-rule (4).

- (9) Cranes shall be operated only by authorised persons who are well trained and experienced, operators shall ensure that all safety devices are functioning properly before crane is put into operation.
- (10) A mobile crane shall be operated so that none of its parts can approach live electric lines closer than 3 m. While lifting loads such a crane shall be located on level ground.
- (11) Standard signals shall be used and operators shall recognise signals from only one person during crane operation. Signal men shall direct equipment movement at fills, quarries, pits, intersections or any other place where necessary to prevent possible accidents.
- (12) No person shall be permitted to work or walk under a load.
- (13) Thorough inspection and load testing of a crane shall be done by a competent person at least once every 12 months. The load to be used for the purpose of testing shall be as follows:

Safe working load	Test load
Up to 20 tons	25% in excess
20 - 50 tons	5 tons in excess
Over 50 tons	10% in excess
- (14) All lifting machines, ropes, chains and lifting tackles, except a fibre rope or fibre sling, which have been lengthened, altered or repaired by welding or otherwise, shall, before being again taken into use, be adequately re-tested and re-examined by a competent person and certificate of such test and examination be obtained, and particulars entered in the register kept in accordance with sub-rule (4).
- (15) No person under 18 years of age and no person who is not sufficiently competent and reliable shall be employed as driver of a lifting machine whether driven by mechanical power or otherwise, or to give signals to a driver.
- (16) Where the Competent Authority is satisfied that in a factory due to shutdown or for any other reasons it is not practicable to maintain a minimum distance of 6 metres between the person employed or working on or near the wheel track of a travelling crane and the crane, it may on the request of the manager reduce the distance to such extent as it may consider necessary and also prescribe further precautions indicating appointment of suitable number of supervisors to ensure the safety of the persons while they are employed or working on or near the track.

**Rules 35-36**

**36. PRESSURE VESSELS OR PLANTS.-**

(1) Interpretation.-In this rule-

- (a) "design pressure" means the maximum pressure that a pressure vessel or plant is designed to withstand safely when operating normally;
- (b) "maximum permissible working pressure" means the maximum pressure at which a pressure vessel or plant is permitted to be operated or used under this rule and is determined by the technical requirement of the process;
- (c) "plant" means a system of piping that is connected to a pressure vessel and is used to contain a gas, vapour or liquid under pressure greater than the atmospheric pressure, and includes the pressure vessel;
- (d) "pressure vessel" means a vessel that may be used for containing, storing, distributing, transferring, distilling, processing or otherwise handling any gas, vapour or liquid under pressure greater than the atmospheric pressure and includes any pipeline fitting or other equipment attached thereto or used in connection therewith; and
- (e) "competent person" means a person as defined in Sr.No. 5. of schedule to rule 31.

(2) Exceptions.-Nothing in this rule shall apply to -

- (a) vessels made of ferrous materials having an internal operating pressure not exceeding 1 kilogram per square centimeter;
- (b) steam boilers, steam and feed pipes and their fittings coming under the purview of the Indian Boilers Act, 1923;
- (c) metal bottles or cylinders used for storage or transport of compressed gases or liquefied or dissolved gases under pressure covered by the Gas Cylinder Rules, 1981 framed under the Indian Explosives Act, 1884;
- (d) vessels in which internal pressure is due solely to the static head of liquid;
- (e) vessels with a nominal water capacity not exceeding 500 litres connected in a water-pumping system containing air that is compressed to serve as a cushion;
- (f) vessels for nuclear energy application shall be covered by rules framed by Competent Authority;
- (g) refrigeration plant having a capacity of 3 tons or less of refrigeration in 24 hours; and

**Rule 36**

- (h) working cylinders of steam engines or prime movers, feed pumps and steam traps; turbine casings; compressor cylinders; steam separators or dryers; steam strainers; steam de-super- heaters; oil separators; air receivers for fire sprinkler installations; air receivers of monotype machines provided the maximum working pressure of the air receiver does not exceed 130 kPa (1.33 kg/sq.cm) and the capacity 85 litres; air receivers of electrical circuit breakers; air receivers of electrical relays; air vessels on pumps, pipe coils, accessories of instruments and appliances such as cylinders and piston assemblies used for operating relays and interlocking type of guards; vessels with liquids subjected to static head only; and hydraulically operating cylinders other than any cylinder communicating with an air loaded accumulator.

(3) Design and construction.-Every pressure vessel or plant used in a factory -

- (a) shall be properly designed on sound engineering practice;
- (b) shall be of good construction, sound material, adequate strength and free from any patent defects; and
- (c) shall be properly maintained in a safe working condition:

Provided that the pressure vessel or plant in respect of the design and construction of which there is an Indian standard or a standard of the country of manufacture or any other law or regulation in force, shall be designed and constructed in accordance with the said standards, law or regulation, as the case may be, and a certificate thereof shall be obtained from the manufacturer or from the competent person which shall be kept and produced on demand by an Inspector.

(4) Safety devices.-Every pressure vessel shall be fitted with-

- (a) a suitable safety valve or other effective pressure relieving device of adequate capacity to ensure that the maximum permissible working pressure of the pressure vessel shall not be exceeded. It shall be set to operate at a pressure not exceeding the maximum permissible working pressure and when more than one protective device is provided, only one of the devices need be set to operate at the maximum permissible working pressure and the additional device shall be set to discharge at a pressure not more than 5 percent in excess of the maximum permissible working pressure;
- (b) a suitable pressure gauge with a dial range not less than 1.5 times the maximum permissible working pressure, easily visible and designed to show at all times the correct internal pressure and marked with a prominent red mark at the maximum permissible working pressure of the pressure vessel;
- (c) a suitable nipple and globe valve connected for the exclusive purpose of attaching a test pressure gauge for checking the accuracy of the pressure gauge referred to in clause (b) of this sub-rule;
- (d) a suitable stop valve or valves by which the pressure vessel may be isolated from other pressure vessels or plant or source of supply of pressure. Such a stop valve or valves shall be located as close to the pressure vessel as possible and shall be easily accessible;

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which shall be 1.5 times the maximum permissible working pressure:

Provided that the pressure vessel or plant which is so designed and constructed that it cannot be safely filled with water or liquid or is used in service when even some traces of water cannot be tolerated, shall be pneumatically tested at a pressure not less than the design pressure or maximum permissible working pressure as the case may be:

Provided further that the pressure vessel or plant which is lined with glass shall be tested hydrostatically or pneumatically as required at a pressure not less than the design pressure or maximum permissible working pressure as the case may be.

Explanation:- Design pressure shall be not less than the maximum permissible working pressure and shall take into account the possible fluctuations of pressure during actual operation.

- (b) No pressure vessel or plant shall be used in a factory unless there has been obtained from the maker of pressure vessel or plant or from the competent person a certificate specifying the design pressure or maximum permissible working pressure thereof, and stating the nature of tests to which the pressure vessel or plant and its fittings (if any) have been subjected, and every pressure vessel or plant so used in a factory shall be marked so as to enable it to be identified as to be the pressure vessel or plant to which the certificate relates and certificate shall be kept available for perusal by the Inspector.
- (c) No pressure vessel or plant shall be permitted to be operated or used at a pressure higher than its design pressure, or the maximum permissible working pressure as shown in the certificate.

(7) In-service test and examinations.-

- (a) Every pressure vessel or plant in service shall be thoroughly examined by a competent person -
  - (i) externally, once in every period of six months; and
  - (ii) internally, once in every period of twelve months:

Provided that if by reason of the construction of a pressure vessel or plant, a thorough internal examination is not possible, this examination may be replaced by a hydrostatic test which shall be carried out once in every period of two years:

Provided further that for a pressure vessel or plant in continuous process which cannot be frequently opened, the period observations, findings and conclusions with other relevant remarks with reasons and may authorise the pressure vessel or plant to be used and kept in operation subject to a lowering of maximum permissible working pressure, or to more frequent or special examination or test, or subject to both of these conditions.

**Rules 36-38**

- (b) A report of every examination or test carried out shall be completed in Form 5 and shall be signed by the person making the examination or test, and shall be kept available for perusal by the Inspector at all hours when the factory or any part thereof is working.
  - (c) Where the report of any examination under this rule specified any condition for securing the safe working of any pressure vessel or plant, the pressure vessel or plant shall not be used unless the specified condition is fulfilled.
  - (d) The competent person making report of any examination under this rule, shall within seven days of the completion of the examination, send to the Competent Authority a copy of the report in every case where the maximum permissible working pressure is reduced or the examination shows that the pressure vessel or plant or any part thereof cannot continue to be used with safety unless certain repairs are carried out or unless any other safety measure is taken.
- (10) Application of other laws.-
- (a) The requirements of this rule shall be in addition to and without any prejudice to and not in derogation of the requirements of any other law in force.
  - (b) Certificates or reports of any examination, or test of any pressure vessel or plant to which sub-rules (7) to (9) do not apply, conducted or required to be conducted under any other law in force and other relevant record relating to such pressure vessel or plant, shall be properly maintained as required under the said law and shall be produced on demand by the Inspector.

**38. EXCESSIVE WEIGHTS.-**

- (1) No person, unless aided by another person or any mechanical device, shall carry or move by hand or head any material, article, tool or appliance exceeding the maximum limit in weight set out in the following Table:-

<b>TABLE</b>	
Persons	Max. weight of material, article, tool or appliance in kg
a) Adult Male	55
b) Adult female	30

Provided that the dimensions of material, tool or appliance shall be such as not to make worker unstable and not to hurt others:

Provided further that pregnant females shall not be engaged for lifting loads.

- (2) No female worker shall engage in conjunction with others, in lifting carrying or moving by hand or on head any material article, tool or appliance if the weight thereof exceeds the lowest weight fixed by Table to sub rule (1) above for any of the persons engaged multiplied by the persons engaged.

**Rules -39**

**39. PROTECTION OF EYES.- Effective screens or suitable goggles shall be provided for the protection of persons employed in or in the immediate vicinity of the following processes, namely:-**

- (1) The processes specified in Schedule I to this rule, being processes which involve risk of injury to eyes from particles or fragments thrown off in the course of the processes.
- (2) The processes specified in Schedule II to this rule, being processes which involve risk of injury to eyes by reason of exposure to excessive light or infra-red or ultra-violet radiations.

**SCHEDULE I**

**INJURY TO EYE FROM PARTICLES**

1. Breaking, cutting, dressing or carving of bricks, stone, concrete, slag or similar materials by means of a hammer, chisel, pick or similar hand tool, or by means of a portable tool driven by mechanical power, and the dry grinding of surfaces of any such materials by means of a wheel or disc driven by mechanical power, where in any of the foregoing cases, particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
2. Dry grinding of surfaces of metal by applying them by hand to a wheel, disc or band driven by mechanical power, and of surfaces of metal by means of a portable tool driven by mechanical power.
3. Dividing into separate parts of metal, bricks, stone, concrete or similar materials by means of a high speed saw driven by mechanical power or by means of an abrasive cutting-off wheel or disc driven by mechanical power.
4. Turning of metals or articles of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
5. Drilling by means of portable tools, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
6. Welding and cutting of metals by means of an electric, oxy- acetylene or similar process.
7. Hot fettling of steel castings by means of a flux-injected burner or air torch, and de-seaming of metal.
8. Fettling of metal castings involving the removal of metal, including runners, gates and risers, and removal of any other material during the course of such fettling.
9. Chipping of metal, and chipping, knocking out, cutting out or cutting off of cold rivets, bolts, nuts, lugs, pins, collars or similar articles from any structure or plant, or from part of any structure or plant, by means of a hammer, chisel, punch or similar hand tool, or by means of a portable tool driven by mechanical power.
10. Chipping or scurfing of paint, scale, slag, rust or other corrosion from the surface of metal and other hard materials by means of a hand tool or by a portable tool driven by mechanical power.

**Rule 39(Sch.I-II)**

11. Breaking of scrap metal by means of a hammer or by means of a tool driven by mechanical power.
12. Routing of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
13. Work with drop hammers and power hammers used in either case for the manufacture of forgings, and work by any person not working with such hammers, whose work is carried on in such circumstances and in such a position that particles or fragments are liable to be thrown off towards his face during work with drop hammers or power hammers.
14. Work at a furnace where there is risk to the eyes from molten metal.
15. Pouring or skimming of molten metal.
16. Work involving risk to the eyes from hot sand being thrown off.
17. Truing or dressing of an abrasive wheel.
18. Handling in open vessels or manipulation of strong acids or dangerous corrosive liquids or materials, and operation, maintenance or dismantling of plant or any part of plant being plant or part of plant which contains or has contained such acids, liquids or materials, unless the plant or part of plant has been so prepared (by isolation, reduction of pressure, or otherwise), treated, or designed and constructed as to prevent risk of injury.
19. Any other process wherein there is a risk of injury to eyes from particles or fragments thrown off during the course of the process.

**SCHEDULE II**

**INJURY TO EYE FROM LIGHT AND RADIATION**

1. Welding or cutting of metals by means of an electrical, oxy- acetylene or similar process.
2. All work on furnaces where there is risk of exposure to excessive light or infra-red radiations.
3. Process such as rolling, casting or forging of metals, where there is risk of exposure to excessive light heat or infra-red radiations.
4. Any other process wherein there is a risk of injury to eyes from exposure to excessive light or infra-red or ultra-violet radiations.

**Rules 40-41**

- 40. MINIMUM DIMENSIONS OF MANHOLES.-** Every chamber, tank, vat, pipe, flue or other confined space, which persons may have to enter and which may contain dangerous fumes to such an extent as to involve risk of the persons being overcome thereby, shall unless there is other effective means of egress, be provided with a manhole which may be rectangular, oval or circular in shape, and shall have the following dimensions as minimum, namely:-

Rectangular shape- 50 cm X 30 cm

Oval shape - Major & minor axis diameters 50 cm. and 30 cm. respectively.

Circular shape - 50 cm diameter

- **41. EXEMPTIONS.-** The requirements of sub-section (4) of section 37 of the Act shall not apply to the following processes carried on in any factory, namely:-

- (1) the operation of repairing a water sealed gasholder by the electric welding process, subject to the following conditions, namely:-
- (a) the gasholder shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture:  
  
Provided that this exemption shall not apply to any gasholder containing acetylene or mixture of gases to which acetylene has been added intentionally; and
  - (b) welding shall only be done by the electric welding process and shall be carried out by experienced operatives under the constant supervision of a competent person;
- (2) the operations of cutting or welding steel or wrought iron gas mains and services by the application of heat, subject to the following conditions, namely:-
- (a) the main or service shall be situated in the open air, and it shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture;
  - (b) the main or service shall not contain acetylene or any gas or mixture of gases to which acetylene has been added intentionally;
  - (c) the operation shall be carried out by an experienced person or persons and at least 2 persons (including those carrying out the operations) experienced in work on gas mains and over 18 years of age shall be present during the operation;
  - (d) the site of the operation shall be free from any flammable or explosive gas or vapour;
  - (e) where acetylene gas is used as a source of heat in connection with an operation, it shall be compressed and contained in a porous substance in a cylinder; and
  - (f) prior to the application of any flame to the gas main or service, this shall be pierced or drilled and the escaping gas ignited.

**Rules -45**

**45. PLANNING OF BUILDING CONSTRUCTION & ROADS, SIDEWALKS.-**

(1) General.- All constructions shall conform to National Building Code of Indian Standards Institution now Bureau of Indian Standards.\*

(2) Means of access for industrial buildings.-

(a) Means of access for industrial buildings & those buildings which attract large crowd shall be adequate.

The length of the main access shall be determined by the distance from the farthest building to the public street. The length of the subsidiary accessories shall be measured from the point of its' origin to the next wider road on which it meets.

(b) Pathways: The approach to the buildings from road/street/internal means of access shall be adequate and through paved pathways.

(c) Intersection of Roads: For intersection junction of roads meeting at right angles as well as other than right angles, the rounding off or cut off or splay or similar treatment shall be done, depending upon the width of the roads, traffic, sighting angle etc. to provide clear sight distance.

(d) Speed Breakers & Pedestrian Passage: Speed breakers shall be provided on all roads which lead to main road near the junction. The pedestrian crossings shall be marked.

(e) Sign Boards & Signs: Sign boards displaying information on maximum permissible speeds and appropriate road signs wherever required shall be provided. The maximum permissible speed on internal roads shall be decided by the manager of the factory depending on the traffic, size and number of vehicles, number of persons working in a particular building etc. The sign boards, road signs & pedestrian crossings shall be of fluorescent paint. The speed limit on various roads shall be decided by the factory manager.

(3) Guarding of pits, sumps, trenches, manholes etc.-Pits, sumps, trenches, manholes and any other openings in the wall or floor shall be adequately covered or guarded. these shall be periodically checked and record maintained.

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\* Note-The Code covers aspects of administrative regulations, development control rules & general building & fire protection requirements; rules for design of electrical, etc. installations; regulation for ventilation etc. & plumbing services; measures to ensure safety of workers & public during construction etc.

**Rule - 46**

**46. CONSTRUCTION & ERECTION.**-Manager shall take appropriate measures with the approval of the Inspector to minimise the effects of occupational hazards arising out of animals, reptiles, rodents, poisonous plants and weeds, weather conditions and living conditions.

(1) General.-

(a) Site preparation - While preparing the site for construction, bush and other wood, debris, etc, shall be removed and promptly disposed of so as to minimize the attendant hazards.

Temporary buildings for construction offices and storage shall be so located as to cause the minimum fire hazards and shall be constructed from non-combustible materials as far as practicable.

(b) Access for Fire Fighting Equipment & Vehicles - Access for fire fighting equipment shall be provided to the construction site at the start of construction and maintained until all construction work is completed:

(i) Free access from the street to fire hydrants/static water tanks, where available, shall be provided and maintained at all times;

(ii) No materials for construction shall be placed within 3m of hydrants/static water tanks; and

(iii) During building operations, free access to permanent, temporary or portable first-aid fire fighting equipment shall be maintained at all times.

(c) Access to the Upper Floors During Construction- In all buildings over two storeys high, at least one stairway shall be provided in usable condition at all times. This stairway shall be extended upward as each floor is completed. As far as possible, there shall be a handrail on the staircase.

(2) Storage, Stacking & Handling of Materials.-Construction of Plant and Building: Construction requires various kinds of materials such as cement; lime; masonry units; aggregate;. fly ash; timber; protective clothing; electrical fittings etc. These shall be stored and handled as per prevalent good practices & relevant national standards in order to ensure quality & quantity of materials used in the construction and safety of personnel handling these materials.

(3) Safety Requirements for Erection of Structural Steel Work.-

(a) Organization of Work - The agency responsible for erecting the steel work shall analyze the proposed erection scheme for safety. The erection scheme shall cover safety aspects right from the planning stage up to the actual execution of the work and make provision for personnel protective equipments.

(b) Safety of Men:

(i) General - Skilled workers trained in relevant jobs shall only be employed in jobs requiring skills.

(1) All personnel protective equipments like helmets, goggles, safety shoes, gloves, aprons etc. shall be suitable for the job & shall conform to relevant Indian Standards

**Rule - 46**

- (2) When the work is in progress, the area shall be cordoned off by barricades to structural components, or falling into excavated trenches or getting injured by falling objects.
  - (3) Warning signs shall be displayed where necessary to indicate hazards, for example (a) '440 VOLTS', (b) 'DO NOT SMOKE', (c) 'MEN WORKING AHEAD', etc.
  - (4) All electrically operated hand tools shall be provided with proper earthing.
  - (5) Hand lamps shall be of low voltage preferably 24 V to prevent electrical hazards.
- (ii) Anchors for guys or ties shall be checked for proper placement. The weight of concrete in which the anchors are embedded shall be checked for uplift and sliding:
- (1) Split-end eye anchors shall only be used in good, solid rock.
  - (2) The first load lifted by a guy derrick shall be kept at a small height for about 10 minutes and the anchors immediately inspected for any signs or indications of failure.
  - (3) When a number of trusses or deep girders are loaded in one car or on one truck, all but one being lifted shall be tied back unless they have been tied or braced to prevent their falling over and endangering men unloading.
  - (4) The erection gang shall have adequate supply of bolts, washers, rivets, pins, etc. of correct size. Enough number of bolts shall be used in connecting each piece using a minimum of two bolts in a pattern to ensure that the joint will not fail due to dead load and erection loads.  
  
All splice connections in columns, crane girders, etc., shall be completely bolted or riveted or welded as specified in the drawing before erection.
  - (5) Safety belts shall always be provided & used for working at heights. The ropes shall be chemically treated to resist dew and rotting. These shall not be tied on sharp edges of steel structures. They shall be tied generally not more than 2 to 3 m. away from the belt.
  - (6) On a guy derrick or climbing crane job, the tool boxes used by the erection staff shall be moved to the new working floor each time the rig is changed. On a mobile crane job, the boxes shall be moved as soon as the crane starts operating in a new area too far away for the men to reach the boxes conveniently.

**Rule 46**

- (7) Baskets or containers to hold small materials such as bolts and drift pins shall be provided to men working on floats or scaffolds. Men shall be trained to use such containers, and to keep small tools gathered up and put away in tool boxes when not in use. Material shall not be dumped overboard when a scaffold is to be moved. Rivet heaters shall have safe containers or buckets for hot rivets left over at the end of the day.
- (8) During the erection of tall buildings, nylon nets at a height of 3 to 4 m. shall be provided to ensure safety of men if there is a fall from heights.

In case of industrial buildings the height of which is in excess of 4 m a temporary strong net shall be provided below the roof, at a height of 3 m to 4 m above the floor, over which workers are working.

- (9) Safety Against Fire - A fire protection procedure shall be set up if there is to be any flame cutting, burning, heating, riveting or any operation that could start a fire. Following precautions shall be observed during welding and cutting operations.
    - (a) The workers shall be instructed not to throw objects like hot rivets, cigarette stubs, etc, around.
    - (b) Sufficient number of fire extinguishers, preferably of soda acid type shall be placed at strategic points. Extinguishers shall always be placed in cranes, hoists, compressors and similar places. Where electrical equipments are involved, CO<sub>2</sub> or dry powder extinguishers shall be provided.
  - (10) Riding on a load, tackle or runner shall be prohibited.
  - (11) The load shall never be allowed to rest on wire ropes. Ropes in operation shall not be touched. Wire ropes/manila ropes conforming to acceptable standards shall be used for guying.
  - (12) Lifting Appliances - Necessary precautions as laid down in rule 37 shall be followed.
- (c) Safety of Structure: General -The structure itself shall be safeguarded during its erection & erection of columns shall be immediately followed by vertical bracing between columns before the roof structure is erected.

**Rule 46****(4) Excavation.-**

- (a) Excavation shall be planned in advance so that hazards due to falling and things falling are avoided. Accident prevention measures shall be adopted and effectively carried out on each job because of inherent dangers.
- (b) Underground utilities such as water mains, drainage lines, electrical cables, gas lines etc. shall be located and protected wherever necessary.
- (c) Adequate measures shall be taken to prevent dislodgement of loose or unstable earth, rock or other material from falling into the excavation by proper timbering.
- (d) Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.
- (e) No excavation below the level of any foundation of a building or structure (if the excavation is liable to effect the building) shall be commenced unless adequate shoring has been provided to prevent any danger to the building.
- (f) In every excavation work along sloping ground, sides and slopes of ground shall be maintained in a safe condition by scaling, benching or barricading. Loose earth and loose rock shall be scaled continuously. To ensure safety of workers engaged on such work, each worker shall be provided with safety belt attached to a safety line. On steep slopes workers shall not be permitted to work one above the other. All such scaling work shall be done under good supervision.
- (g) All trenches, 120 cm or more in depth, shall at all times be supplied with at least one ladder for each 30 meters in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least one metre above the surface of the ground.
- (h) Every accessible part on an excavation or an opening in the ground into which a person is liable to fall vertically through a height of 2 meters, shall be barricaded to a height of one metre.
- (i) Measures shall be taken to prevent spectators and other workmen who are not engaged in excavation work, from approaching excavation areas by placing warning signals etc. near the site of the excavation. Provisions shall also be made to prevent animals from falling into excavation areas.

**(5) Shoring.-**

- (a) Additional precautions by way of shoring and bracing shall be taken to prevent slides, slips or caveins when excavations or trenches are made in locations subject to vibrations from railway or road traffic, the operation of machinery or any other source of vibration.
- (b) Excavation over 1.2 m in depth, unless in solid rock or hard soil shall be shored and braced or sloped to the angle of repose of the material when consolidated. All shoring and bracing shall extend to the bottom of the excavation when necessary.
- (c) No person shall work in an excavation shaft, earth work of tunnel unless all timbering or planks used therein has been inspected by a competent person before the commencement of the work.

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(6) Night work. –

- (a) Excavated area shall be adequately lighted up for night work.
- (b) During night, a red danger light shall be displayed at a conspicuous place near the excavation site to warn approaching traffic and men.

(7) Disposal of soil

The excavated material shall be dumped sufficiently away from the edge of the excavated trench to avoid the excavated material slipping and falling into the trench. The excavated materials and any other material or load shall not be dumped or placed within 1.5m of the edges of the trench or half of the depth of the trench whichever is more.

(8) Scaffolding:

- (a) Suitable scaffolds shall be provided for workmen for all works that cannot be done safely from the ground.
- (b) All the members of a scaffold such as planks, braces, vertical supports, horizontal supports shall be of sound material, good construction and of adequate strength. They shall be properly maintained.
- (c) No plank shall be kept loose so that levering of the plank is avoided. Nails of proper size shall be used for construction of scaffolds in sufficient numbers and driven fully in.
- (d) Scaffolding or staging more than 3.5 meters above the ground floor swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least one metre high above the the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
- (e) On unprotected scaffolds at high elevations the men must wear life belts suitably anchored to some substantial part of the structure.
- (f) Side screens shall be provided on scaffold erected along passageways.
- (g) The platform of a suspended scaffold shall not be less than 45 cm. wide and points of suspension not more than 3 m apart and so arranged, that, at the working position, the edge is as close as practicable to the working face when persons have to work in a sitting position. Suspended scaffolds shall be tested as before use to ensure that minimum safety factors are maintained. The test will be made by raising the working surface 30 cm. above the ground and loading it with at least three times the maximum weight that will be imposed upon it.

**Rule 46-47**

- (h) A safe and convenient means of access shall be provided to the platform or scaffold. Means of access may be a portable ladder, fixed ladder, ramp or a stairway. The use of cross braces or frame work as means of access to the working surface shall not be permitted.
  - (i) All scaffolds, before use, shall be examined by the engineer in charge.
  - (j) Every working place and approach thereto, every place where raising or lowering operations with the use of lifting appliance are in progress and all openings dangerous to persons employed shall be adequately and suitably lighted.
  - (k) During dismantling of scaffolds necessary precautions shall be taken to prevent injury to persons due to fall of loose materials.
  - (l) Bracings and other members of the scaffolds shall not be removed prematurely while dismantling the entire scaffold which shall be maintained stable and rigid so as to avoid the danger of collapse.
  - (m) Care shall be taken to see that no uninsulated electric wire exists within 3 metres of the working platform, gangways, runs, etc. of the scaffold.
  - (n) Good house-keeping shall be maintained at all times upon scaffolds, platforms and ramps. Excessive storage of materials thereon shall be avoided. Care must be taken to avoid accumulation of small objects such as tools, pieces of
  - (c) A man shall be specially employed as signalman to watch the movement of the bucket and warn the crew and vibrator operators of the approaching bucket so that all workers may clear out of the area affected by the bucket. Signalman shall be so stationed in a safe place that they can see the entire area where concrete is being placed.
- (12) Work in open areas and specially at height shall be stopped under adverse weather conditions such as strong winds, snowfall, rainfall and under any other conditions specified by Safety Officer/Inspector.

**47. TEMPORARY ELECTRICAL WIRING.-**

- (1) Frayed and / or bare wires shall not be used for temporary electrical connections during construction. All temporary wiring shall be installed and supervised by a competent electrician. Adequate protection shall be provided for all electrical wiring laid on floor which may have to be crossed over by construction machinery or by the workmen. All flexible wiring connecting the electrical appliances shall have adequate mechanical strength and shall preferably be enclosed in a flexible metal sheath. Overhead wires/cables shall be so laid that they leave adequate head room. Clearance for the above shall be obtained from the competent person.
- (2) All electrical circuits, other than those required for illumination of the site at night, shall be switched off at the close of day's work. The main switch board from which connections are taken for lighting, power operated machinery, etc, shall be located in an easily accessible and prominent place. No article of clothing nor stores shall be kept at the back of or over the board or anywhere near it. One 3-kg/4.5-kg CO<sub>2</sub> extinguisher or one 5-kg dry powder extinguisher shall be provided near the switch board.

**Rules 48-50**

- 48. BUILDINGS & STRUCTURES.-** No building, wall, chimney, bridge, tunnel, road, gallery, stairway, ramp, floor, platform, staging, or other structure, whether of a permanent or temporary character, shall be constructed, situated or maintained in any factory in such a manner as to cause risk of bodily injury.
- 49. MACHINERY AND PLANT.-** No machinery, plant or equipment shall be constructed, situated, operated or maintained in any factory in such a manner as to cause risk of bodily injury or adverse effect on health. The Safety Officer shall have authority to stop the work if he finds that unsafe practices are being followed and/or unsafe conditions exist.
- 50. METHODS OF WORK.-** No process or work shall be carried in any factory in such a manner as to cause risk of bodily injury. Schedule for Hand Tools & Portable Power Tools is given below.

**SCHEDULE**

**HAND TOOLS & PORTABLE POWER TOOLS**

1. Hand tools:-
- (a) Definition: Hand tool means any tool which is used without any external motive power.
  - (b) Hand tools shall be of good quality materials, conforming to relevant BIS standards and shall be used only for the job it is designed for. Non sparking tools such as that made of Beryllium Copper alloy shall be used for working in explosive areas.
  - (c) Workers shall be trained & instructed for proper use of tools such as files, hammers, hacksaws etc.
  - (d) Proper tool bags shall be provided to workers to carry the tools and not leaving them on floors, passages etc.
  - (e) Protective equipments such as gloves, goggles etc. shall be provided to and worn by the workers.
  - (f) The tools shall be inspected regularly, repaired and maintained.
2. Portable Power Tools.-
- (a) Definition: Portable Power Tool means a tool powered by electric or pneumatic power, operated by a single operator and which is transportable from place to place.
  - (b) Portable power tools shall conform to the relevant BIS standards and shall be used for the job it is designed for. Starting switches shall be located at such places where accidental starting cannot take place.
  - (c) Electrically operated tools shall be used only with 3 core cable with proper earthing provided. This should be checked before use.

**Rules 50-51**

- (d) Electrically operated tools shall not be used where flammable vapours, gases or dusts are present, unless they are specially designed for use in such environment.
- (e) Proper guards shall be provided for tools such as grinders, saws etc. and operators shall be provided with personal protective equipments wherever required.
- (f) In case of pneumatic tools a short chain shall be provided for attaching the air hose and tools housings securely to prevent it from whipping in case of breaking of the coupling.
- (g) Periodic inspection and maintenance shall be carried out for electrical insulation, earthing, integrity etc.

**51. STACKING AND STORING OF MATERIALS, ETC.- No materials or equipment shall be stacked or stored in such a manner as to cause risk of bodily injury.**

**52. LADDERS.-**

- (1) Every ladder shall be of good construction, sound material and of adequate strength for the purpose for which it is used. The rungs shall be parallel, level and uniformly spaced at 30 cm.
- (2) Ladders shall be inspected regularly and repaired immediately. No ladder with defective or missing rungs shall be used. Wooden ladders shall not be painted. For preserving the material from deterioration linseed oil or clear varnish shall be used.
- (3) No portable single ladder shall be over 9 m in length while the width between side rails in rung ladder shall in no case be less than 28 cm for ladder up to and including 3 m in length. For longer ladders this width shall be increased at least 20 mm for each additional metre of length. Uniform step spacing shall not exceed 30 cm.
- (4) All ladders with spreading bases such as step and trestle ladders shall be equipped with rigid spreads or some other means to prevent their premature opening or closing.
- (5) Ladders shall be in a safe position before being climbed. The best angle for a ladder is 75 with the horizontal i.e., the distance of the base of the ladder from the wall, pole structure etc., as the case may be shall be 1/4th its length.
- (6) A ladder shall be stored upon brackets and in sheltered locations.
- (7) A ladder shall not be placed upon a box, barrel, or other movable insecure object and against a round or angular pillar such as pipe or narrow steel section etc.
- (8) Two ladders must not be spliced together as far as possible. When it is inevitable they shall be tied together properly to ensure rigidity. Extra parallel members at the point of splicing may be added to each of the main members of the ladder. Two ladders shall not be spliced together to provide access to a greater height than when a single ladder is used.

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- (9) Bamboo ladders shall be provided with twisted wire loops enclosing both longitudinal members to prevent them from opening outwards. However, such ladders where longitudinal members are reinforced with metal/wire loops shall not be used when working on electrical circuits.
- (10) Metal ladders with insulating rubber shoes shall only be used for working with electrical lines or in places where they may come in contact with such wires.
- (11) No worker shall work from a plank placed on the rungs of ladders.
- (12) All permanently installed vertical ladders above a height of 3 m shall have manguards provided.

**53. OVENS AND DRIERS.-**

- (1) Application - This rule shall apply to ovens and driers, except those used in laboratories or kitchens of any establishment and those which have a capacity below 325 litres.
- (2) Definition:- For the purpose of this rule, "oven or drier" means any enclosed structure, receptacle, compartment or box which is used for baking, drying or otherwise processing of any article or substance at a temperature higher than the ambient temperature of the air in the room or space in which explosive mixture of air and a flammable substance is likely to be evolved within the enclosed structure, receptacle, compartment or box or part thereof on account of the article or substance which is baked, dried or otherwise processed within it.
- (3) Separate electrical connection.- Electrical power supplied to every oven or drier shall be by means of a separate circuit provided with an isolation switch.
- (4) Design, Construction, examination and testing.-
  - (a) Every oven or drier shall be properly designed on sound engineering practice and be of good construction, sound materials and adequate strength, free from any patent defects and safe if properly used.
  - (b) No oven or drier shall be taken into use in a factory for the first time unless a competent person has thoroughly examined all its parts and carried out the tests as are required to establish that the necessary safe systems and controls provided for safety in operation for the processes for which it is to be used and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.

**55. EXAMINATION OF EYE SIGHT OF CERTAIN WORKERS.-**

- (1) No person shall be employed to operate a crane, locomotive or fork-lift truck, or to give signals to a crane or locomotive operator unless his eyesight and colour vision have been examined and declared fit by a qualified ophthalmologist to work whether with or without the use of corrective glasses.

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- (2) The eye sight and colour vision of the person employed as referred to in clause 1 shall be examined at least once in every period of 12 months up to the age of 45 years and once in every 6 months beyond that age.
- (3) Any fee payable for an examination of a person under this sub-rule shall be paid by the contractor/occupier and shall not be recoverable from that person.
- (4) The record of examination or re-examination carried out as required under sub-rule 1 shall be maintained in Form-1.

**57. QUALITY OF PERSONAL PROTECTIVE EQUIPMENT.-**

**All Personal Protective**

**Equipment provided to workers as required under any of the provisions of the Act or the Rules shall conform to the relevant Indian Standards.**

**58. PROTECTIVE EQUIPMENT.- The Inspector may, having regard to the nature of the hazards involved in work and process being carried out, order the occupier or the manager in writing to supply to the workers exposed to particular hazard any personal protective equipment as may be found necessary.**

**59. THERMIC FLUID HEATERS.-**

- (1) All heaters shall be of such construction that coils are removable for periodic cleaning, visual inspection and hydraulic test.
- (2) Suitable arrangements shall be made for cooling the furnace effectively in case of power failure.
- (3) Before restarting the furnace, it shall be effectively purged.
- (4) Velocity of flow of the thermic fluid shall not be allowed to fall below the minimum recommended by the manufacturers while the heater is in operation.
- (5) The thermic fluid shall be circulated in a closed circuit formation with an expansion cum deaerator tank. This tank shall be located outside the shed where the heater is installed.
- (6) Every heater shall be provided with a Photo-resistor actuated audio-visual alarm to indicate flame failure and automatic burner cut off.
- (7) The stack temperature monitor-cum-controller with audio- visual alarm shall be provided so as to warn the operator in case the outlet temperature exceeds the specified minimum.
- (8) Where inspection doors are provided on the furnace they shall be interlocked with the burner itself so that they cannot be opened until burner is shut off and furnace is cooled sufficiently.
- (9) All heaters shall also be provided with the following safety devices:-
  - (a) level control in the expansion tank;
  - (b) temperature control of thermic fluid;

**Rules 59-60**

- (c) differential pressure switch on the outlet line of the heater tubes; and
  - (d) temperature control device for the fuel oil supply to the burner.
- (10) All evices mentioned in sub-rule (9) shall have interlocking arrangement with burner so that in case of any predetermined limits being crossed the supply of fuel and air to burner shall automatically be cut-off.
  - (11) All safety interlocks when operated shall be indicated on the control panel of the heater by a suitable audio visual alarm.
  - (12) Every heater unit shall be provided as a standard accessory an arrangement for sniffing with low pressure steam or nitrogen for putting out the fire.
  - (13) Electric panel for the heater shall be located near the heater but not so close as to be exposed to spilling or leaking oil.
  - (14) The heater shall be located in a place segregated from other manufacturing activities.
  - (15) Explosion vent shall be so installed that release takes place at safe location.
  - (16) The heater oil shall be subjected to pressure test by competent person once at least in every 12 months. The test pressure shall not be less than twice the operating pressure.
  - (17) If repairs are carried out to the coil, it shall be tested before taking it into use.
  - (18) The thermic fluid shall conform to the specifications prescribed by the manufacturer and shall be tested by competent person for suitability at least once in every three months period. Such tests shall include test for acidity, suspended matter, ash contents, viscosity and flash point.
  - (19) Cleaning of the internal surface of the heater or soot and check up of refractory surface on the inside shall be carried out every month or as often as required depending upon working conditions. The coils shall be removed and surface of the coils cleaned thoroughly once at least in a period of six months. The burner, nozzles, oil filters and pumps shall be cleaned once a week during the period of use.
  - (20) A separate register containing the following information shall be maintained,-
    - (a) weekly checks carried out confirming the effectiveness of the interlock;
    - (b) weekly checks confirming that all accessories are in good state of repairs; and
    - (c) information regarding fuel oil temperature, pressure, thermic fluid inlet/outlet pressure and temperature, fuel gas temperature, recorded at 4 hourly interval.
  - (21) The heater when in operation shall always be kept in charge of a trained operator.

**60. RECORD KEEPING & ANNUAL REVIEW.**-Each factory shall maintain a record of field equipment failures and Failure Mode, Effect & Criticality Analysis in prescribed Forms 7 & 8 respectively. This data and analysis shall be used for preparation of preventive maintenance schedules and prevention of potential hazards. In addition, the factory shall conduct an annual review of unusual occurrences and accidents occurred and submit the report to the Competent Authority.

**Rules 61-62**

**61. COLOUR CODING OF SERVICE LINES.-**

- (1) Pipelines for water, air, oil and gases shall be colour coded as per Indian Standard: 2379-1963 & Indian Standard: 5-1978.
- (2) Electrical conduit panels shall be colour coded as per Indian Standard: 375-1951 & Indian Standard: 5-1978.

**62. HAZARDOUS CHEMICALS.-** The occupier of every factory involving hazardous process shall fill the Form 9 entitled 'Material Safety Data Sheet' and inform all employees of the factory, and the Competent Authority about the hazards involved. The Competent Authority may, on the basis of Material Safety Data Sheet mentioned above direct the Manager in writing to supply the workers exposed to particular hazard any necessary personal protective equipment conforming to relevant Indian Standards and prescribe the information and manner in which this information is to be passed on to the general public residing in the vicinity of the factory.

**CHAPTER V****WELFARE****63. WASHING FACILITIES.-**

- (1) There shall be provided and maintained, in every factory for the use of employed persons adequate and suitable facilities for washing which shall include soap and nail brushes or other suitable means of cleaning and the facilities shall be conveniently accessible and shall be kept in a clean and orderly condition.
- (2) Without prejudice to the generality of the foregoing provisions, the washing facilities shall include-
- (a) a trough with taps or jets at intervals of not less than 60 cm.; or
  - (b) wash basins with taps attached there to; or
  - (c) taps on stand-pipes; or
  - (d) showers controlled by taps; or
  - (e) circular troughs of fountain type:

Provided that the Inspector may having regard to the needs and habits of the workers, fix the proportion in which the aforementioned types of facilities shall be installed.

- (3) (a) Every trough and basin shall have a smooth, impervious surface and shall be fitted with a waste-pipe and plug.
- (b) The floor or ground under and in the immediate vicinity of every trough, tap, jet, wash-basin, stand-pipe, and shower shall be so laid or finished as to provide a smooth impervious surface and shall be adequately drained.
- (4) For persons whose work involves contact with any injurious or noxious substance there shall be at least one tap for every fifteen persons, and for persons whose work does not involve such contact the number of taps shall be as prescribed in the Schedule given below.

**SCHEDULE**


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Number of workers	Number of taps
(1)	(2)
Up to 20	1
21 to 35	2
36 to 50	3
51 to 150	4
151 to 200	5

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(1)	(2)
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Exceeding 200 but not exceeding 500	5 plus one tap for every 50 or fraction of 50
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Exceeding 500	11 plus one tap for every 100 or fraction there of 100
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- (5) If female workers are employed, separate washing facilities shall be provided and so enclosed or screened that the interiors are not visible from any place where persons of other sex work or pass. The entrance to such facilities shall bear conspicuous notice "For Women Only" in the language understood by the majority of the workers and shall also be indicated pictorially.
- (6) The water supply to the washing facilities shall be capable of yielding at least 27 litres a day for each person employed in the factory and shall be from a source approved in writing by the Medical Officer if the source of supply is not the same as for drinking water:

Provided that where the Competent Authority is satisfied that such an yield is not practicable he may by certificate in writing permit the supply of a smaller quantity not being less than 5 litres per day for every person employed in the factory.

**64. FACILITIES FOR KEEPING CLOTHING.-** All classes of factories mentioned in the Schedule to this rule shall provide facilities for keeping clothing not worn during working hours. Such facilities shall include the provision of arrangements approved by the Competent Authority. The Competent Authority shall have powers to add other factories under the Schedule given below:-

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**SCHEDULE**

- Chemical works.
  - Engineering workshops.
  - Glass works.
  - Automobile workshops.
  - Power Plants.
- 

**5. FIRST-AID AND FIRST-AID APPLIANCES.-** The first-aid oxes or cupboards shall be distinctively marked with a red cross on white background and shall contain the following equipments, namely :-

- (1) The manager of the factory shall lay down procedures for First-Aid and medical services

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so that injured or ill person receives prompt attention or aid. The person here means, a worker of the factory, contractor's labour or even a visitor.

- (2) For factories in which the number of persons employed does not exceed ten, or in the case of factories in which mechanical power is not used & the number of persons does not exceed fifty each first-aid box or cupboard shall contain the following equipments, namely:-
- (a) Six small size sterilised dressings.
  - (b) Three medium size sterilised dressings.
  - (c) Three large size sterilised dressings.
  - (d) Three large size sterilised burn dressings.
  - (e) One (60 ml) bottle of centrimide solution (1%) or a suitable antiseptic solution.
  - (f) One (60 ml) bottle of mercury chrome solution (2%) in water.
  - (g) One (30 ml) bottle containing sal-volatile having the dose and mode of administration indicated on the label.
  - (h) One pair of scissors.
  - (i) One roll of adhesive plaster (2 cm X 1 m).
  - (j) Six pieces of sterilised eye pads in separate sealed packets.
  - (k) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.
  - (l) Polythene wash bottle (1/2 litre, i.e. 500 cc) for washing eyes.
  - (m) A snake-bite lancet.
  - (n) One (30 ml) bottle containing potassium permanganate crystals.
  - (o) One tourniquet.
  - (p) A supply of suitable splints, and
  - (q) One copy of First-Aid leaflet issued by the Competent Authority.
- (3) For factories in which mechanical power is used and in which the number of persons employed exceeds ten but does not exceed fifty, each first-aid box or cupboard shall contain the following equipments, namely:-
- (a) Double of the quantity as indicated in respect of items (a) to (g) of sub-rule (2) above.
  - (b) Six (15 gms) packets of sterilized cotton wool.
  - (c) One pair of scissors.

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- (d) Two rolls of adhesive plaster (2 cm X 1 m).
  - (e) Eight pieces of sterilized eye pads in separate sealed packets.
  - (f) One tourniquet.
  - (g) A supply of suitable splints.
  - (h) One dozen safety pins.
  - (i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.
  - (j) One polythene wash bottle (1/2 litre i.e., 500 cc) for washing eyes.
  - (k) A snake-bite lancet.
  - (l) One(30 ml) bottle containing potassium permanganate crystals.
  - (m) One copy of the first-aid leaflet issued by the Competent Authority.
- (4) For factories employing more than fifty persons, each First-Aid box or cupboard shall contain the following equipments, namely:-
- (a) Double of the quantity as indicated in respect of items (a) to (e) of sub-rule (2) above.
  - (b) One (200 ml) bottle of centrimide solution(1%) or a suitable antiseptic solution.
  - (c) One (200 ml) bottle of mercury chrome (2%) solution in water
  - (d) One (120 ml) bottle of sal-volatile having the dose and mode of administration indicated on the label.
  - (e) One pair of scissors.
  - (f) One roll of adhesive plaster (6 cm X 1 m).
  - (g) Two rolls of adhesive plaster (2 cm X 1 m).
  - (h) Twelve pieces of sterilized eye pads in separate sealed packets.
  - (i) A bottle containing 100 tablets (each of 325 mg) of aspirin or any other analgesic.
  - (j) One polythene wash bottle (500 cc) for washing eyes.
  - (k) Twelve roller bandages 10 cm wide.
  - (l) Twelve roller bandages 5 cm wide.
  - (m) Six triangular bandages.
  - (n) One tourniquet.
  - (o) A supply of suitable splints.

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- (p) Two packets of safety pins.
- (q) Kidney tray.
- (r) A snake-bite lancet.
- (s) One(30 ml) bottle containing potassium permanganate crystals.
- (t) One copy of first-aid leaflet issued by the Competent Authority:

Provided that items (j) to (q) inclusive, need not be included in the standard first-aid box or cupboard where there is a properly equipped ambulance room, or if at least one box containing such items placed and maintained in accordance with the requirements of section 45 is separately provided:

Provided further that the medical officer of the factory may alter the type and quantity of the contents at his discretion. The list of contents shall, however, be pasted inside the first aid box.

- (5) In lieu of the dressings required under items (a) and (b), these may be substituted by adhesive wound dressings approved by the Competent Authority and other equipment or medicines that may be considered essential and recommended by the Competent Authority from time to time.

- 66. NOTICE REGARDING FIRST-AID.-** A notice containing the names of the persons working within the precincts of the factory who are trained in first-aid treatment and who are in charge of the first-aid boxes or cupboards shall be posted in every factory at a conspicuous place and near each such box or cupboard. The notice shall also indicate workroom where the said person shall be available. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.

**67. AMBULANCE ROOM.-**

- (1) Every ambulance room shall be under the charge of at least one whole-time qualified medical practitioner (hereinafter referred to as medical officer) who shall be assisted by at least one qualified nurse or dresser-cum-compounder and one nursing attendant in each shift. The medical officer shall be readily available on call during working hours of the factory:

Provided that where a factory works in more than one shift, the Competent Authority, if it is satisfied that on account of the size of the factory, nature of hazards or frequency of accidents, it is necessary to employ a whole time medical officer for each shift separately, may, order so in writing.

- (2) There shall be displayed in the ambulance room a notice giving the name, address and telephone number of the medical practitioner in charge. The name of the nearest hospital and its telephone number shall also be mentioned prominently in the said notice.
- (3) No medical officer shall be required or permitted to do any work which is inconsistent with or detrimental to his responsibilities under this rule.

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- (4) The ambulance room shall be separate from the rest of the factory and shall be used only for the purpose of first-aid treatment and rest. It shall have a floor area of at least 24 sq.m. and smooth, hard and impervious walls and floors, and shall be adequately ventilated and lighted by both natural and artificial means. There shall be attached to it at least one latrine & urinal of sanitary type. An adequate supply of wholesome drinking water shall be laid on and the room shall contain at least the following, namely:-
- (a) A glazed sink with hot and cold water always available.
  - (b) A table with a smooth top at least 180 cm X 105 cm.
  - (c) Means for sterilizing instruments.
  - (d) A couch.
  - (e) Two stretchers.
  - (f) Two buckets or containers with close fitting lids.
  - (g) Two rubber hot water bags.
  - (h) A kettle and spirit stove or other suitable means of boiling water.
  - (i) Twelve plain wooden splints 900 mm X 100 mm X 6 mm.
  - (j) Twelve plain wooden splints 350 mm X 75 mm X 6 mm.
  - (k) Six plain wooden splints 250 mm X 50 mm X 12 mm.
  - (l) Six woolen blankets.
  - (m) Three pairs of artery forceps.
  - (n) One bottle of spiritus ammoniac aromaticus (120 ml)
  - (o) Smelling salts (60 gm).
  - (p) Two medium size sponges.
  - (q) Six hand towels.
  - (r) Four "Kidney" trays.
  - (s) Four cakes of toilet, preferably antiseptic soap.
  - (t) Two glass tumblers and two wine glasses.
  - (u) Two clinical thermometers.
  - (v) Two tea spoons.
  - (w) Two graduated (120 ml) measuring glasses.
  - (x) Two minim measuring glasses.
  - (y) One wash bottle (1000 cc) for washing eyes.

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- (z) One bottle (one litre) carbolic lotion 1 in 20.
  - (aa) Three chairs.
  - (bb) One screen.
  - (cc) One electric hand torch.
  - (dd) Four first-aid boxes or cupboards stocked to standards prescribed under(c)of rule 59.
  - (ee) An adequate supply of anti-tetanus toxiod.
  - (ff) Injections - morphia, pethidine, atropine, adrenaline, coramine, novocain (6 each).
  - (gg) Coramine liquid (60 ml).
  - (hh) Tablets -25 each of antihistaminic, antispasmodic.
  - (ii) Syringes with needles - 2 cc, 5 cc, 10 cc and 50 cc.
  - (jj) Three surgical scissors.
  - (kk) Two needle holders, big and small.
  - (ll) Suturing needles and materials.
  - (mm) Three dissecting forceps.
  - (nn) Three dressing forceps.
  - (oo) Three scalpels.
  - (pp) One stethoscope.
  - (qq) Rubber bandage - pressure bandage.
  - (rr) Oxygen cylinder with necessary attachments.
- (5) The occupier of every factory to which these rules apply shall for the purpose of removing serious cases of accidents or sickness, provide in the premises and maintain in good condition a suitable conveyance unless he has made arrangements for obtaining such a conveyance from a hospital.
- (6) The Competent Authority may, by an order in writing exempt any factory from the requirements of this rule, subject to such conditions as it may specify in that order, if a hospital, ambulance room or dispensary is maintained at or within 200 m. of the precincts of the factory and such arrangements are made as to ensure the immediate treatment of all injuries sustained by workers within the factory and for providing rest to the workers so injured.

Explanation:- For the purpose of this rule, "qualified medical practitioner" means a person holding a qualification granted by an authority specified in the schedule to the Indian Medical Degrees Act, 1916 (7 of 1916), or in the schedules to the Indian Medical Council Act, 1956 (102 of 1956).

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**68. CANTEENS.-**

- (1) The occupier of every factory where in more than two hundred and fifty workers are ordinarily employed shall provide in or near factory an adequate canteen according to standard prescribed in these rules.
- (2) The canteen building shall be situated not less than 15 meters from any boiler house, coal stacks, ash dumps and any other source of dust, smoke or obnoxious fumes:

Provided that the Competent Authority may in any particular factory relax the provisions of this sub-rule to such an extent as may be reasonable in the circumstances and may require measures to be adopted to secure the essential purpose of this sub-rule.

- (3) The canteen building shall be constructed in accordance with the plans and shall accommodate at least a dining hall, kitchen, store room, pantry and washing places separately for workers and for utensils.
- (4) In a canteen the floor and inside walls up to a height of 1.2 metres from the floor shall be made of smooth and impervious material; the remaining portion of the inside walls shall be made smooth by cement plaster or in any other manner.
- (5) The doors and windows of a canteen building shall be of flyproof construction and shall allow adequate ventilation.
- (6) The canteen shall be sufficiently lighted at all times when any persons have access to it.
- (7) (a) In every canteen -
  - (i) all inside walls of rooms and all ceilings and passages and staircases shall be limewashed or colourwashed at least once in each year or painted once in three years dating from the period when last limewashed, colourwashed or painted, as the case may be;
  - (ii) all wood work shall be varnished or painted once in three years dating from the period when last varnished or painted; and
  - (iii) all internal structural iron or steel work shall be varnished or painted once in three years dating from the period when last varnished or painted:

Provided that inside walls of the kitchen shall be limewashed once every four months.

- (b) Records of dates on which lime washing, colourwashing, varnishing or painting is carried out shall be maintained in the prescribed register (Form 2).
- (8) The precincts of the canteen shall be maintained in a clean and sanitary condition. Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance. Suitable arrangements shall be made for the collection and disposal of garbage.

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**69. DINING HALL.-**

- (1) The dining hall shall accommodate at a time at least 30 per cent of the workers working at a time and shall be provided with adequate numbers of tables and chairs or benches:

Provided that, in any particular factory or in any particular class of factories, the Competent Authority may by a notification in this behalf alter the percentage of workers to be accommodated.

- (2) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs, shall be not less than 1 sq.m per diner to be accommodated as prescribed in sub-rule (1).
- (3) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number. Washing places for women shall be separate and screened to secure privacy.

**70. EQUIPMENT.-**

- (1) There shall be provided and maintained sufficient utensils, crockery, cutlery, furniture and any other equipment necessary for the efficient running of the canteen. Suitable clean clothes for the employees serving in the canteen shall also be provided and maintained.
- (2) The furniture, utensils and other equipment shall be maintained in a clean and hygienic condition. A service counter, if provided, shall have a top of smooth and impervious material. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

**71. ANNUAL MEDICAL EXAMINATION.-**

- (1) Annual medical examination for fitness of each member of the canteen staff who handles foodstuffs shall be carried out by the factory medical officer or the Certifying Surgeon, which should include the following, namely:-
- (a) routine blood examination;
  - (b) routine and bacteriological testing, of faeces and urine for germs of dysentery and typhoid fever; and
  - (c) any other examination including chest X-ray that may be considered necessary by the factory medical officer or the Certifying Surgeon.
- (2) Any person who in the opinion of the factory medical officer or the certifying surgeon is unsuitable for employment on account of possible risk to the health of others, shall not be employed as canteen staff.

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**72. SHELTERS, REST ROOMS AND LUNCH ROOMS.-**

(1) The shelters, or rest rooms and lunch rooms shall conform to the following standards, namely:-

- (a) the building shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and walls to a height of 90 cm. shall be so laid or finished as to provide a smooth, hard impervious surface;
- (b) the height of every room in the building shall be not less than 3.70 m from floor level to the lowest part of the roof and there shall be at least 1.10 sq.m of floor area for every person employed:

Provided that (i) workers who habitually go home for their meals during the rest periods may be excluded in calculating the number of workers to be accommodated, and (ii) in the case of factories in existence at the date of commencement of the Act, where it is impracticable owing to lack of space to provide 1.10 sq.m. of floor area for each person, such reduced floor area per person shall be provided as may be approved in writing by the Competent Authority;

- (c) effective and suitable provision shall be made in every room for securing and maintaining adequate ventilation by the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting;
- (d) every room shall be adequately furnished with chairs or benches with back-rest; and
- (e) sweepers shall be employed whose primary duty it is to keep the rooms, building and precincts thereof in a clean and tidy condition.
- (f) suitable provision shall be made in every room for supply of drinking water and facilities for washing.

(2) The lunch rooms shall -

- (a) comply with the requirements laid down in clauses (a) to (f) of sub-rule (1), and
- (b) be provided with adequate number of tables with impervious tops for the use of workers for taking food:

Provided that the Competent Authority may exempt any factory from the provisions of this rule subject to the provisions being complied by some other means.

**Rules 73-74**

**73. CRECHES.-**

- (1) The creche shall be conveniently accessible to the mothers of the children accommodated therein and so far as is reasonably practicable it shall not be situated in close proximity to any part of the factory where obnoxious fumes, dust or odours are given off or in which excessively noisy processes are carried on.
- (2) The building in which the creche is situated shall be soundly constructed and all the walls and roof shall be of suitable heat resisting materials and shall be water-proof. The floor and internal walls of the creche shall be so laid or finished as to provide a smooth impervious surface.
- (3) The height of the rooms in the building shall be not less than 3.70 m from the floor to the lowest part of the roof and there shall be not less than 2.00 sq.m of floor area for each child to be accommodated.
- (4) Effective and suitable provision shall be made in every part of the creche for securing and maintaining adequate ventilation by the circulation of fresh air.
- (5) The creche shall be adequately furnished and equipped and in particular there shall be one suitable cot or cradle with the necessary bedding for each child (provided that for children over two years of age it will be sufficient if suitable bedding is made available), at least one chair or equivalent seating accommodation for the use of each mother while she is feeding or attending to her child, and a sufficient supply of suitable toys for the older children.
- (6) A suitably fenced and shady open air playground shall be provided for the older children:  
  
Provided that the Competent Authority may by order in writing exempt any factory from compliance with this sub-rule if he is satisfied that there is not sufficient space available for the provision of such a play-ground.

**74. WASHROOM.-**

- (1) There shall be in or adjoining the creche a suitable washroom for the washing of the children and their clothing. The washroom shall conform to the following standards, namely:-
  - (a) the floor and internal walls of the room to a height of 90 cm. shall be so laid or furnished as to provide a smooth impervious surface. The room shall be adequately lighted and ventilated and the floor shall be effectively drained and maintained in a clean and tidy condition;
  - (b) there shall be at least one basin or similar vessel for every four children accommodated in a creche at any one time together with a supply of water provided, if practicable, through taps from a source approved by the Health Officer. Such source shall be capable of yielding for each child a supply of at least 23 litres of water a day; and
  - (c) an adequate supply of clean clothes, soap and clean towels shall be made available for each child while it is in the creche.

**Rules 74-77**

- (b) there shall be at least one basin or similar vessel for every four children accommodated in a creche at any one time together with a supply of water provided, if practicable, through taps from a source approved by the Health Officer. Such source shall be capable of yielding for each child a supply of at least 23 litres of water a day; and
  - (c) an adequate supply of clean clothes, soap and clean towels shall be made available for each child while it is in the creche.
- (2) Adjoining the washroom referred to in sub-rule (1), a latrine shall be provided for the sole use of the children in the creche. The design of latrine and the scale of accommodation to be provided shall either be approved by the Public Health authorities or, where there is no such Public Health authority, by the Competent Authority.
- 75. SUPPLY OF MILK AND REFRESHMENT.**-At least a quarter litre of clean pure milk shall be available for each child on every day if accommodated in the creche and the mother of such a child shall be allowed in the course of her daily work, four intervals of at least 15 minutes to feed the child. For children above two years of age there shall be provided in addition an adequate supply of wholesome refreshment.
- 76. CRECHE STAFF.**- For each creche there shall be appointed a woman in-charge and an adequate number of female attendants to help the woman in-charge. No woman in-charge shall be appointed under this rule unless she possesses the qualifications prescribed for a midwife or produces a certificate that she has undergone training for a period of not less than 18 months in a hospital, maternity home or nursing home approved in this behalf by the Competent Authority or produces a certificate that she has received training for a pre-primary teacher in an institution approved by the State Government. The creche staff shall be provided with suitable clean clothes for use while on duty in the creche.
- 77. EXEMPTION FROM THE PROVISION OF CRECHE.**-
- (1) In factories where the number of married women or widows employed does not exceed 15 or where the factory works for less than 180 days in a calendar year, or where number of children kept in the creche was less than 5 in the preceding year, the Competent Authority may exempt such factories from the provisions of section 48 and the rules 73 to 76 made thereunder, if he is satisfied that alternate arrangements as stipulated under subrule (2) are provided by the factory.
  - (2) (a) The alternate arrangements required in sub-rule (1) shall include a creche building which has a minimum accommodation at the rate of 1.90 sq. m. per child and constructed in accordance with the plans approved by the Competent Authority.
  - (b) The creche building shall have -
    - (i) a suitable washroom for washing of the children and their clothing;
    - (ii) adequate supply of soap and clean clothes and towels; and
    - (iii) adequate number of female attendants who are provided with suitable clean clothes for use while on duty to look after the children in the creche.
  - (3) The exemption granted under sub-rule (1) may at any time be withdrawn by the Competent Authority if it finds after such enquiry as he may deem fit, that the factory has committed a breach of this rule.

**Rules -78**

**78. WELFARE OFFICER.-**

(1) Number of Welfare Officers.-

- (a) The occupier of every factory employing between five hundred(500) and two thousand (2000) workers shall appoint at least one Welfare Officer, and where the number of workers exceeds 2000, there shall be an additional Welfare Officer for every additional 2000 workers or fraction thereof over 500. In a factory where both men and women workers are employed, the number of women Welfare Officers to be appointed shall be in proportion to the women workers employed provided that where the number of women employed is more than 100 and the total number of workers does not exceed 2500 an additional woman Welfare Officer shall be appointed.
- (b) Where there are more than one Welfare Officer appointed, one of them shall be called the Chief Welfare Officer and the others Assistant Welfare Officers.

(2) Qualifications.- A person shall not be eligible for appointment as a Welfare Officer, unless he -

- (a) possesses a degree of a University recognised by the Government in this behalf;
- (b) has obtained a degree or diploma in social science with specialization in industrial relations from any institution recognised by the Government in this behalf; and
- (c) has adequate knowledge of the language spoken by the majority of the workers in the factory to which he is to be attached:

Provided that the Competent Authority, may by notification grant exemption from the provisions of clause (b) in suitable cases till such time as qualified persons are available:

Provided further that, in the case of a person who is acting as a Welfare Officer at the commencement of these rules, the Competent Authority may, subject to such conditions as it may specify, relax all or any of the aforesaid qualifications.

(3) Appointment of Welfare Officers.-

- (a) The appointment of welfare officers shall be done as per the extant government procedures.
- (b) The appointment when made shall be notified by the occupier to the Competent Authority or such authority as the Competent Authority may specify for the purpose, giving full details of the qualifications, etc. of the officer appointed and the conditions of his service.

(4) Conditions of service of Welfare Officers.-

- (a) A Welfare Officer shall be given appropriate status corresponding to the status of the other executive heads of the factory and he shall be started on a suitable scale of pay equivalent to that of group B officer, the minimum of which shall not be less than Rs.2000/- per month.

**Rules -78**

- (b) The conditions of service of a Welfare Officer shall be the same as of other members of the staff of corresponding status in the factory.
- (5) Duties of Welfare Officer.- The duties of a Welfare Officer shall be -
- (a) to establish contacts and hold consultations with a view to maintaining harmonious relations between the factory management and workers;
  - (b) to bring to the notice of the factory management the grievances of workers, individual as well as collective, with a view of securing their expeditious redress and to act as a liaison officer between the management and labour;
  - (c) to study and understand the point of view of labour in order to help the factory management to shape and formulate labour policies and to interpret these policies to the workers in a language they can understand;
  - (d) to watch industrial relations with a view of using his influence in the event of a dispute between the factory management and workers and to help to bring about a settlement by persuasive effort;
  - (e) to advise on fulfillment by the management and the concerned departments of the factory of obligations, statutory or otherwise, concerning regulation of working hours, maternity benefit, medical care, compensation for injuries and sickness and other welfare and social benefit measures;
  - (f) to advise and assist the management in the fulfillment of its obligations, statutory or otherwise, concerning prevention of personal injuries and maintaining a safe work environment, in such factories where a Safety Officer is not required to be appointed under the enabling provisions under section 40 B;
  - (g) to promote relations between the concerned departments of the factory and workers which will bring about productive efficiency as well as amelioration in the working conditions and to help workers to adjust and adapt themselves to these working environments;
  - (h) to encourage the formation of Works and Joint Production Committees, Co-operative Societies and Welfare Committee, and to supervise their work;
  - (i) to encourage provision of amenities such as canteens, shelters for rest, creches, adequate latrine facilities, drinking water, sickness and benevolent scheme payments, pension and superannuation funds, gratuity payments, granting of loans and legal advice to workers;
  - (j) to help the factory management in regulating the grant of leave with wages and explain to the workers the provisions relating to leave with wages and other leave privileges and to guide the workers in the matter of submission of application for grant of leave for regulating authorised absence;
  - (k) to advise on provision of welfare facilities, such as housing facilities, foodstuffs, social and recreational facilities, sanitation, advice on individual personnel problems and education of children;

**Rules -78**

- (l) to advise the factory management on questions relating to training of new starters, apprentices, workers on transfer and promotion, instructors and supervisors, supervision and control of notice board and information bulletins to further education of workers and to encourage their attendance at technical institutes; and
  - (m) to suggest measures which will serve to raise the standard of living of workers and in general promote their well- being.
- (6) Welfare Officers not to deal with disciplinary cases or appear on behalf of the management against workers.- No Welfare Officer shall deal with any disciplinary cases against workers or appear before a conciliation officer in a court or tribunal on behalf of the factory management against a worker or workers.
- (7) Powers of exemption.- The Competent Authority may, by notification exempt any factory or class or description of factories from the operation of all or any of the provisions of this chapter, subject to compliance with such alternative arrangements as may be approved by such Competent Authority.

**Rule 88 (Sch. -X)**

**SCHEDULE X**

**FINISHING BY ABRASIVES PROPELLED BY COMPRESSED AIR/STEAM**

Cleaning or Smoothing, Roughening, etc., of Articles, by a Jet of Sand, Metal Shot, or Grit, or other Abrasive Propelled by a Blast of Compressed Air or Steam:

1. Definition.- For the purposes of this Schedule
  - (a) "blasting" means cleaning, smoothening, roughening, or removing of any part of the surface of any article by the use as an abrasive of a jet of sand, metal shot, or grit or other material, propelled by a blast of compressed air or steam;
  - (b) "blasting enclosure" means a chamber, barrel, cabinet or any other enclosure designed for the performance of blasting therein;
  - (c) "blasting chamber" means a blasting enclosure in which any person may enter at any time in connection with any work or otherwise; and
  - (d) "cleaning of castings" where done as an incidental or supplemental process in connection with the making of metal castings, means the freeing of the casting from adherent sand or other substance and includes the removal of cores and the general smoothening of a casting, but does not include the free treatment.
2. Prohibition of sand blasting.- Sand or any other substance containing free silica shall not be introduced as an abrasive into any blasting apparatus and shall not be used for blasting:  
  
Provided further that no woman shall be employed or permitted to work at any operation of sand blasting.
3. Precautions in connection with blasting operations.-
  - (a) Blasting shall not be done except in a blasting enclosure and no work other than blasting and any work immediately incidental thereto and clearing and repairing of the enclosure including the plant and appliances situated therein, shall be performed in a blasting enclosure. Every door, aperture and joint of blasting enclosure, shall be kept closed and air-tight while blasting is being done therein.
  - (b) Blasting enclosure shall always be maintained in good condition and effective measures shall be taken to prevent dust escaping from such enclosure, and from apparatus connected therewith, into the air of any room.
  - (c) There shall be provided and maintained for and in connection with every blasting enclosure, efficient apparatus for separating, so far as practicable, abrasive which has been used for blasting and which is to be used again as an abrasive, from dust or particles of other materials arising from blasting; and no such abrasive shall be introduced into any blasting apparatus and used for blasting until it has been so separated:

**Rule 88 (Sch. -X)**

Provided that this clause shall not apply, except in the case of blasting chambers, to blasting enclosures constructed or installed before the coming into force of this schedule, if the Competent Authority is of opinion that it is not reasonably practicable to provide such separating apparatus.

- (d) There shall be provided and maintained in connection with every blasting enclosure efficient ventilating plant to extract, by exhaust draught effected by mechanical means, dust produced in the enclosure. The dust extracted and removed shall be disposed of by such method and in such manner that it shall not escape into the air of any room; and every other filtering or settling device situated in a room in which persons are employed, other than persons attending to such bag or other filtering or settling device, shall be completely separated from the general air of that room in an enclosure ventilated to the open air.
- (e) The ventilating plant provided for the purpose of sub-paragraph (d) shall be kept in continuous operation whenever the blasting enclosure is in use whether or not blasting is actually taking place therein, and in the case of a blasting chamber, it shall be in operation even when any person is inside the chamber for the purpose of cleaning.

4. Inspection and examination.-

- (a) Every blasting enclosure shall be specially inspected by a competent person at least once in every week in which it is used for blasting enclosure, the apparatus connected therewith and the ventilating plant shall be thoroughly examined and in the case of ventilating plant, tested by a competent person at least once in every month.
- (b) Particulars of the result of every such inspection, examination or test shall forthwith be entered in a register which shall be kept in Form 10 and shall be available for inspection by any workman employed in or in connection with blasting in the factory. Any defect found on any such inspection, examination or test this paragraph applies shall be deemed for the purposes of this Paragraph to have been constructed, reconstructed or converted for use as such after the making of this Schedule if the construction, reconstruction or conversion thereof was begun after the making of this Schedule.

5. Provision of protective helmets, gauntlets and overalls.-

- (a) There shall be provided and maintained for the use of all persons who are employed in a blasting chamber, whether in blasting or in any work connected therewith or in cleaning such a chamber, protective helmets of a type approved by a certificate of the Competent Authority; and every such person shall wear the helmet provided for this use whilst he is in the chamber and shall not remove it until he is outside the chamber.
- (b) Each protective helmet shall carry a distinguishing mark indicating the person by whom it is intended to be used and no person shall be allowed or required to wear a helmet not carrying his mark or a helmet which has been worn by another person and has not since been thoroughly disinfected.

**Rule 88(Sch.X)**

- (c) Each protective helmet when in use shall be supplied with clean and not unreasonably cold air at a rate of not less than 170 litres per minute.
  - (d) Suitable gauntlets and overalls shall be provided for the use of all persons while performing blasting or assisting at blasting, and every such person shall while so engaged, wear the gauntlet and overall provided.
6. Precautions in connection with cleaning and other work -
- (a) Where any person is engaged upon cleaning of any blasting apparatus or blasting enclosure or of any apparatus or ventilating plant connected therewith or the surroundings thereof or upon any other work in connection with any blasting apparatus or blasting enclosure or with any apparatus or ventilating plant connected therewith so that he is exposed to the risk of inhaling dust which has arisen from blasting, all practicable measures shall be taken to prevent such inhalation.
  - (b) In connection with any cleaning operation referred to in paragraph 5, and with the removal of dust from filtering or settling devices all practicable measures shall be taken to dispose of the dust in such a manner that it does not enter the air of any room. Vacuum cleaners shall be provided and used wherever practicable for such cleaning operations.
7. Storage accommodation for protective wear.- Adequate and suitable storage accommodation for the helmets, gauntlets and overalls required to be provided by paragraph 5 shall be provided outside and conveniently near to every blasting enclosure and such accommodation shall be kept clean. Helmets and overalls when not in actual use shall be kept in this accommodation.
8. Maintenance and cleaning of protective wear.- All helmets, gauntlets, overalls and other protective devices or clothings provided and worn for the purposes of this schedule, shall be kept in good condition and so far as is reasonably practicable shall be cleaned on every weekday in which they are used. Where dust arising from the cleaning of such protective clothing or devices is likely to be inhaled, all practicable measures shall be taken to prevent such inhalation. Vacuum cleaners shall, wherever practicable, be used for removing dust from such clothing and compressed air shall not be used for removing dust from any clothing.
9. Maintenance of vacuum cleaning plant.- Vacuum cleaning plant used for the purpose of this schedule shall be properly maintained.
10. Medical facilities and records of examinations and tests.-
- (a) The occupier of every factory to which the Schedule applies, shall
    - (i) employ a qualified medical practitioner for medical surveillance of the workers employed therein, and whose

**Rule 88(Sch.X)**

employment shall be subject to the approval of the Competent Authority;  
and

- (ii) provide to the said medical practitioner all the necessary facilities for the purpose referred to in clause (i) above.
- (b) The record of medical examinations and appropriate tests carried out by the said medical practitioner shall be maintained in a separate register approved by the Competent Authority which shall be kept readily available for inspection by the Inspector.

11. Medical examination by Certifying Surgeon.-

- (a) Every worker employed in any of the processes to which this schedule applies shall be examined by a Certifying Surgeon within 15 days of his first employment. Such examination shall include pulmonary function test and chest X-ray. No worker shall be allowed to work after 15 days of his first employment in the factory unless certified fit for such employment by the Certifying Surgeon.
- (b) Every worker employed in the said processes shall be re-examined by a Certifying Surgeon at least once in every 12 calendar months and such re-examination shall, wherever the Certifying Surgeon considers appropriate, include pulmonary function test and chest X-ray once in every three years.
- (c) The Certifying Surgeon after examining a worker, shall issue a Certificate of Fitness in Form 1. The record of examination and re-examinations carried out shall be entered in the Certificate and the Certificate shall be kept in the custody of the manager of the factory. The record of each examination carried under subparagraphs (a) and (b), including the nature and the results of the tests, shall also be entered by the Certifying Surgeon in a health register in Form 1A.
- (d) The Certificate of Fitness and the health register shall be kept readily available for inspection by the Competent Authority.
- (e) If at any time the Certifying Surgeon is of the opinion that a worker is no longer fit for employment in the said processes on the ground that continuance therein would involve special danger to the health of the worker, he shall make a record of his findings in the said certificate and the health register. The entry of his findings in those documents shall also include the period for which he considers that the said person is unfit for work in the said processes. The person so suspended from the process shall be provided with alternate placement facilities unless he is fully incapacitated in the opinion of the Certifying Surgeon, in which case the person affected shall be suitably rehabilitated.
- (f) No person who has been found unfit to work in the said processes as said in subparagraph (e) above shall be reemployed or permitted to work unless the Certifying Surgeon, after further examination, again certifies him fit for employment in those processes.

**Rule 88( Sch. X)**

12. Power to exempt or relax.-

- (a) If the Competent Authority is satisfied that in any factory or any class of factories, the use of sand or other substance containing free silica as an abrasive in blasting is necessary for a particular manufacture or process (other than the process incidental or supplemental to making of metal castings) and that the manufacture or process cannot be carried on without the use of such abrasive or that owing to the special conditions or special method of work or otherwise any requirement of this schedule can be suspended either temporarily or permanently, or can be relaxed without endangering the health of the persons employed or that application of any of such requirements is for any reason impracticable or inappropriate, it may, with the previous sanction of the Central Government, by an order in writing exempt the said factory or class of factories from such provisions of this schedule, to such an extent and subject to such conditions and for such period as may be specified in the said order.
- (b) Where an exemption has been granted under sub-paragraph (a), a copy of the order shall be displayed at a notice board at a prominent place at the main entrance or entrances to the factory and also at the place where the blasting is carried on.

**89. NOTIFICATION OF ACCIDENTS.-**

- (1) Where any accident specified in sub-para (a) of para 1 of the Schedule to this rule or any occurrences specified in para 2 of the said schedule takes place in a factory, the Manager of the factory, in which the accident occurred, shall within four hours of the happening of such accident or occurrence, send notice there of in Form 11 by telephone, telex, telegram or special messenger to the inspector and the Competent Authority and when the accident is fatal or it is of such a nature that it is likely to prove fatal, notice as aforesaid shall also be sent to-
  - (a) the District Magistrate or sub Divisional Magistrate;
  - (b) the Officer In Charge of the nearest Police Station;
  - (c) the Electrical Inspector (In case of electrical accident); and
  - (d) the relatives of the injured or deceased person.
- (2) The notice so given shall be confirmed by the Manager of the factory to the above mentioned authorities within 12 hours of the accident/occurrence by sending a written report in Form 12 and in case of electrical accidents in Form 13 to the Electrical Inspector.
- (3) When any accident of a minor nature specified in sub-para (b) of the said para 1 of the schedule takes place in a factory, the Manager of the factory shall within 24 hours after the expiry of the period specified in the said sub-para (b) , send notice thereof in the Form 11 to the medical officer; & the Competent Authority.

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- (4) If, in case of an accident, the injured person subsequently dies due to such accident, information of his death whenever known shall be sent by the Manager of the factory by telephone, telex, telegram or special messenger within 24 hours of the occurrence to-
- (a) the District Magistrate or Sub-Divisional Magistrate;
  - (b) the Officer In Charge of the nearest Police Station;
  - (c) the Competent Authority; and
  - (d) the Electrical Inspector (In case of Electrical accidents).

**EXPLANATION: Accident of serious nature means an accident which results in either or all of the following, namely:-**

- (i) Immediate loss of any part of the body or any limb or part there of;**
  - (ii) Crushed or Serious injury to any part of the body due to which loss of the same is obvious or any injury which is likely to prove fatal;**
  - (iii) Unconsciousness;**
  - (iv) Severe burns or scalds due to chemicals, steam or any other cause; and**
  - (v) Any injury to man/animal due to electrical energy.**
- (5) The Manager of the factory shall lay down the procedures for investigation of all accidents and occupational illnesses reported as per Forms 12 and 14.

**SCHEDULE**

1.
  - (a) Accidents which cause death to any person or are of a serious nature.
  - (b) Accidents which cause such bodily injury as prevents or will probably prevent the person injured from working for a period of 48 hours or more immediately following the accident.
2. The following classes of occurrences, whether or not they are attended by personal injury or disablement:-
  - (a) Bursting of a vessel used for containing steam under pressure greater than atmospheric pressure, other than plant which comes within the scope of the Indian Boilers Act.
  - (b) Collapse or failure of a crane, derrick, winch, hoist or other appliances used in raising or lowering persons or goods or any part thereof, or the overturning of a crane.
  - (c) Explosion, fire, bursting out, leakage or escape of any molten metal, or hot liquor or gas causing bodily injury to any person or damage to any room or place in which persons are employed.

**Rules 89(Sch.)-102**

- (d) Explosion of a receiver or container used for the storage at a pressure greater than atmospheric pressure of any gas or gases(including air) or a liquid or solid resulting from the compression of gas.
  - (e) Collapse or subsidence of any floor, gallery, roof, bridge, tunnel, chimney, wall or building, forming part of a factory or within the compound or curtilage of factory.
3. Leakage or release of effluents to the outside environment above those specified by the Department of Environment and Air and Water Pollution Control Boards.
- 90. NOTICE OF POISONING OR DISEASE. - A notice in Form 14 shall be sent with in four hours to the Competent Authority by the manager of the factory in which there occurs a case of poisoning or disease due to items mentioned in the Third Schedule of section 45 of the Factories Act, 1948(63 of 1948).**
- 98. REGISTER OF ACCIDENTS AND DANGEROUS OCCURRENCES. - The manager of every factory shall maintain a register of all accidents and dangerous occurrences which occur in the factory. All these shall be investigated thoroughly and causes established. Any deficiency found in respect of systems & practices shall be corrected & report thereof shall be made available to the inspector & Competent Authority.**
- 99. MAINTENANCE OF INSPECTION BOOK.- The manager of every factory shall maintain a register of inspection reports and shall produce it when so required by the Competent Authority or Certifying Surgeon.**
- 101. COMMUNICATION FACILITIES.- The Manager shall establish effective communication facilities so that in the normal as well as in emergency conditions the Shift-in-charge is able to contact without delay the factory manager, control room, security, fire station, dispensary, workers and the outside agencies such as police, fire brigade, hospital, district magistrate, civil defence post.**
- 102. SPECIAL POWERS OF THE COMPETENT AUTHORITY.- The Competent Authority shall have powers to notify specific safety procedures, guides, manuals to enhance safety & health in any factory.**



( 2 )

6. I certify that I have personally examined Dr./Shri/Smt./Kum.. ..... and seen his/her other medical reports and my recommendations are recorded below.

7.	Work with/in/at	Recommendations
.1.	Chemicals and hazardous materials including prescribed materials	Fit/Unfit
.2.	Machines	
.2.1	Cranes	Fit/Unfit
.2.2	Locomotives	Fit/Unfit
.2.3	Fork lifts	Fit/Unfit
.3.	Blasting by compressed air/steam for cleaning of articles.	Fit/Unfit
.4.	Radioactive Area	Fit/Unfit
.5.	Any other work specified by the Competent Authority...	Fit/Unfit

Signature of Certifying Surgeon

Name .....

Date:

Reg.No. ..

Note: Strike out whichever is not applicable.

**Medical Examination Record**

S.No.	Date of	Remarks
-----	-----	-----
	<b>Last Examination      Next Examination</b>	

**HEALTH REGISTER OF WORKERS EMPLOYED ON SPECIFIED JOBS**

( See rules 7(4), 88)

Name of the Factory:

S.No.	Name	Age Yrs.	Nature of job	Medica l Exam.	Employment in present work	Date of Learning or transfer to other work	If suspended from work period of suspension	Date of resumption of duty	Signature with date of certifying surgeon
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N.B. Against column Nature of job please write the applicable number as given below:

- (1) Working with Chemicals & Hazardous materials.
- (2) Working with-2.1 rotating machines; 2.2 lifting machines; 2.3 material handling equipment.
- (3) Working with -3.1 electrical work-low & medium voltage; 3.2 electrical work-high voltage.
- (4) At height.
- (5) At blasting by compressed air/steam for cleaning of articles.
- (6) Radioactive area.

**REPORT OF EXAMINATION OF HOISTS & LIFTS****(See Rule 34)**

1. Name of the Factory :
- 2.1 Type of hoist or lift and identification No. or description :
- 2.2 Date of construction/reconstruction :
3. Are all parts of the hoist or lift, of good mechanical construction, sound material and adequate strength (so far as ascertainable) :
4. Are the following parts of the hoist or lift properly maintained and in good working order? If not, state what defects have been found.
  - .1. Enclosure of hoistway or liftway :
  - .2. Landing gates and cage gate(s) :
  - .3. Interlocks and the landing gates and cage gate(s) :
  - .4. Other gate fastenings :
  - .5. Cage and platform and fittings, guides, buffers, interior of the hoistway or liftway. :
  - .6. Overrunning devices :
  - .7. Suspension ropes or chain and their attachments. :
  - .8. Safety gear i.e. arrangement for preventing fall of platform or cage brakes. :
  - .9. Brakes :
  - .10. Worm or spur gearing :
  - .11. Other electrical equipment :
  - .12. Other parts :
5. What parts(if any) were inaccessible :
6. Repairs, renewals :
7. Maximum safe work load :

( 2 )

8. Is any of the lift made as per requirements of fire lift & if so its location & identification No. :

9. Other particulars :

I/we certify that on (date) ... .. I/we thoroughly examined this hoist or lift and that the above is a correct report of the result.

**Signature:**

**Name :**

**Date:**

**REPORT OF EXAMINATION OF LIFTING MACHINES**

**Ropes & Lifting Tackles**

( See rule 35(4) )

1. Name of the Factory :
2. Distinguishing number or mark (if any) and description sufficient to identify the lifting machine, chains, rope or lifting tackle. :
3. Date when lifting machine chain, rope or lifting tackle was first used in the factory. :
4. Date and number of certificate of last examination made under section 29(1)a (iii) and by whom it was carried out. :
5. Date and number of certificate relating to any test & examination made, under rules 35.1 & 35.15 together with the name & address of the certifying person. :
6. Date & certificate of annealing or other heat treatment of the chain and lifting tackle carried out as per rule 35.7 and by whom it was carried out. :
7. Particulars of any defect found at any such examination or after annealing and affecting the safe working load and steps taken to remedy such defect. :

I/We certify that on ..... I/We thoroughly examined the above mentioned lifting machine/chain rope/lifting tackle and that the above is a correct report of the result.

**Date:**

**Signature:**

**Name:**

**ITEM FIELD PERFORMANCE REPORT****( See rule 60)**

1. Name of the Factory :
2. Item :
  - .1 Identification :
  - .2 Manufacturer :
  - .3 Number of items of the type :
  - .4 Date of manufacture :
  - .5 Date of modification/reconditioning :
  - .6 Date first placed in use :
  - .7 Cumulative operating time since above :
  - .8 Date & place where used after 2.5 :
  - .9 Date/ cumulative operating time since above :
  - .10 Cumulative time-Non use (Storage/Maintenance) :
4. Operating environment :
  - .1 Temperature Range :
  - .2 Relative humidity range :
  - .3 Nature of atmosphere  
A.C./Clean/Dusty/Corrosive/... :
  - .4 Vibration level :
5. Mode of operation :  
Continuous/Intermittent/Standby/...

( 2 )

- 6. Item failure information :
- .1 Symptoms of failure :
- .2 Failure detected during Operation /  
    Periodic check / Preventive  
    maintenance :
- .3 Functions affected by failure :
- .4 Failure cause :
- Inherent/Misuse/ Maintenance induced/ :
- External to item/ Secondary/Unknown :
- 7. Item failure analysis and correction :
- .1 List of failed parts :
- .2 List of replaced parts :
- .3 Adjustments made :
- 8. Total active downtime :
- 9. Total downtime :
- 10. Any other information :

**Date:**

**Signature:**

**Name :**

**Designation:**

**FAILURE MODE, EFFECT & CRITICALITY ANALYSIS**

[ F M E C A ]

( See rule 60)

Name of the Factory:

System : ...

Sub System: ...

Page \_\_\_\_\_ of \_\_\_\_\_

Code No. : ...

No.	Part No.	Part		Failure Mode		Detection Method	Effect on System Plant	Remarks
		Name	Function	No.	Description			
1	2	3		4		5	6	7

Prepared By ...

Checked By ...

Approved By ...





( 2 )

11. If accident is not fatal, state whether injured person is likely to be disabled for 48 hours or more : Yes/No
12. Name of Medical Officer in attendance on injured person :

I certify that to the best of my knowledge and belief that the above particulars are correct in every respect.

**Date:**

**Manager**

**Signature :**

**Place:**

**Name :**

**Competent Authority.**

**FORM FOR REPORTING ELECTRICAL ACCIDENTS**

( See rule 44-A of the Indian Electricity Rules,1956;

&

**Atomic Energy (Factories)Rules, 1996; rule 89(2))**

1. Date and time of accident :
2. Place of accident and district :
3. System & Voltage of supply :
4. Name of the licensee or person/persons or supplier or user of energy in whose premises or jurisdiction the accident occurred :
5. a) (i) Name of the person :
- (ii) Animal(please specify the name and address of the owner) :
- b) Address of such/each person :
6. Occupation and designation of such person/persons (and in particular whether employed in electrical works or elsewhere) :
7. Brief description of the job undertaken, if any :
8. Authority under which such person / persons was / were allowed to work on the job. State also whether he/they was/were authorised person/persons :
9. Describe fully nature and extent of injuries, e.g. fatal, disablement of any portion of body or other injury, etc. :
10. Detailed causes leading to the accident :
11. Action taken regarding first aid, medical attendance, etc. immediately after the occurrence of the accident. :
12. Whether appropriate Govt. Dist. and police station informed (if so, give the address). :

(2)

- 13. Steps taken to preserve the evidence in connection with the accident to the extent possible. :
- 14. Name and designation/s of the person/s assisting the person/s killed or injured. :
- 15. What safety equipment were given to and used by the person/s who met with this accident(e.g. rubber gloves, rubber mats, safety belts and ladders, etc.). :
- 16. Whether isolating switches and other sectionalising devices were employed to deaden the sections for working on the same, if so, whether these were earthed. :
- 17. Whether the work on live lines was undertaken by an authorized person/s. If so, the name and designation of such person/s may be given. :
- 18. Whether artificial resuscitation treatment was given to the person who met with electric accident. If yes, for how long was it continued, before abandonment. :
- 19. Steps proposed to be taken to avoid recurrence. :
- 20. Names and designations of persons present at the time of accident. :
- 21. Any other remarks. :

**Date:**

**Manager**

**Signature :**

**Time:**

**Name:**

- 1. Electrical Inspector of the region.**
- 2. Competent Authority.**

