Govt of India
Ministry of Jal Shakti
DoWR, RD&GR
National Dam Safety Authority

Policy & Research Wing
R.K. Puram, New Delhi- 110066

MEETING NOTICE

Sub: **6th meeting of the National Committee on Dam Safety (NCDS) constituted as per Dam Safety Act, 2021- Reg.**

The undersigned is directed to convey that the sixth meeting of the National Committee on Dam Safety (NCDS) constituted by the Central Government under the provisions of the Dam Safety Act (DSA), 2021 is scheduled to be held on 03.07.2024, at 11:00 AM in virtual mode through video conferencing.

The agenda of the meeting is as under;

1. Discussion and finalization of the following regulation framed by the NDSA under section 54 (1) of the Dam Safety Act, 2021

Regulation 54(2)(s): the measures necessary to ensure dam safety by every owner of dam other than specified dams under section 46 (Copy enclosed).

2. Any other item with the permission of the Chair

Link for the video conferencing will be shared separately.

It is requested to kindly make it convenient to attend the meeting.

Signed by Shiv Dutta Sharma
Date: 14-06-2024 18:42:44

(Shiv Dutta Sharma)
Member (P&R), NDSA
Tel: 011-29583386
Email: dirpr-ndsa@gov.in

To:

1. The Members of NCDS (As per List A).

Special invitee:

1. All the SDSOs (As per List B)

Copy for kind information to:

1. PPS to Hon'ble Union Minister of Jal Shakti. [Email: minister-jaIshakti@gov.in]
2. PPS to Hon'ble Minister of State for Jai Shakti [Email: mos-mowr@nic.in]
3. PPS to Secretary, DoWR, RD & GR, Ministry of Jal Shakti. [Email: secy-mowr@nic.in]

List 'A'

1. Chairman, Central Water Commission, Ministry of Jal Shakti, Govt. of India [Email: chairman-cwc@nic.in]

2. Chairman, National Dam Safety Authority (NDSA), New Delhi [Email: chmn-ndsa@gov.in]

3. Member (Design & Research), Central Water Commission, Ministry of Jal Shakti, Govt. of India [Email: memberdr-cwc@nic.in]

4. Member (Hydro), Central Electricity Authority, Ministry of Power, Govt. of India. [Email: member.he@cea.nic.in]

5. Joint Secretary (RD & PP) DoWR, RD&GR, Ministry of Jal Shakti, Govt. of India. [Email: jsrd-dowr@gov.in]

6. Member Secretary NDMA, Ministry of Home Affairs, Govt. of India - with the request to nominate representative of NDMA not below the rank of Joint Secretary as member to attend the meeting. [Email: secretary@ndma.gov.in]

7. Secretary, Ministry of Environment, Forest and Climate Change, Govt. of India - with the request to nominate representative of MoEF&CC not below the rank of Joint Secretary as member to attend the meeting. [Email: secy-moef@nic.in]

8. Director General, India Meteorological Department, Ministry of Earth Science, Govt. of India. [Email: directorgeneral.imd@imd.gov.in; m.mohapatra@imd.gov.in]

9. Director General, Geological Survey of India, Ministry of Mines, Govt. of India. [Email: dg.gsi@gov.in]

10. Director, National Remote Sensing Centre, Department of Space, Indian Space Research Organization, Govt. of India. [Email: director@nrsc.gov.in]

11. Director, National Geophysical Research Institute, Ministry of Science and Technology, Govt. of India. [Email: director@ngri.res.in, prakashk@ngri.res.in]

12. Principal Secretary (WR), Govt. of Andhra Pradesh - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E-mail: psdwrap15@gmail.com; splcs-wrd@ap.gov.in]

13. Secretary (Jal Shakti), Govt. of Himachal Pradesh - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E- mail: iphsecy-hp@nic.in]

14. Secretary, (WR), Govt. of Arunachal Pradesh - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E- mail: secretarywrd6@gmaiI.com; geyumpaduce@hotmail.com]

15. Commissioner-cum-Secretary, Water Resources Department, Govt. of Manipur - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E-mail: trsingh13@yahoo.co.in]

16. Secretary (WR), Govt. of Bihar - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E-mail: wrd-bih@nic.in]

17. Secretary (WR), Govt. of Gujarat - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting. [E-mail: secwr@gujarat.gov.in]

18. Secretary (WR), Govt. of Rajasthan - with the request to nominate Engineer-In-Chief or equivalent officer as member to attend the meeting.
    [E-mail: pswrdraj@rajasthan.gov.in; osdwrd@gmail.com]

19. Sh DK Sharma, Chairman, Himachal Pradesh Electricity Regulatory Commission- Specialist in dam safety aspects. [Email: dks.shimIa@gmaiI.com]

20. Prof CVR Murty, P S Rao Institute Chair Professor, Department of Engineering, IIT Madras- Specialist in dam safety aspects. [Email: cvrm@iitm.as.in]

List- B, Head, SDSOs of all States/UTs

1. Chief Engineer, SDSO & Hydrology, Water Resources Department, Vijayawada, Andhra Pradesh [Email: ce_hydrology@ap.gov.in] [ce-damsafety@ap.gov.in]
2. Superintending Engineer (S&I), Itanagar, Arunachal Pradesh [Email: samanronrang@gmail.com]
3. Managing Director, Assam APGCL 0361-2739546 [bibhu.bhuyan@apgcl.org; saurav.saikia@apgcl.org]
4. Chief Engineer, Central Design, Research & Quality Control, W.R.D., Patna, Bihar [Email: sdsobihar@gmail.com]
5. Engineer-in-Chief, WRD, Shivanadh Bhawan, North Block, Sector-19, Atal Nagar, Naya Raipur, Chattisgarh 0771-2512951, 9425549132 [cemrp@cgwrd.in, cemrp1@gmail.com,]
6. Superintending Engineer Circle IV, WRD, Gogal, Margao, Goa [Email: ankush.gaunker@gmail.com]
7. Chief Engineer (North Gujarat) & Additional Secretary, Narmada, Water Resources, Water Supply and Kalpsar Department, Gujarat [Email: ce-ng-nwrws@gujarat.gov.in]
8. Superintending Engineer, YWS(S), I&WRD), Delhi, (SDSO Hariyana) [Email: mahadev395@gmail.com]
9. Dy. Chief Engineer, Directorate of Energy, GoHP, Shimla, Himachal Pradesh Email: djjayin@gmail.com] [ceauthoritydoe@gmail.com] [ceenergy09@gmail.com]
10. Chief Engineer, Design, Master Planning and Hydrology, WRD, Ranchi, Jharkhand [Email: cedesign-wrd-jhr@nic.in]
11. Chief Engineer, DSO, A R Circle, Bangalore, Karnataka [Email: cedsobengaluru@gmail.com]
12. Chief Engineer, Civil-Dam Safety, Kerala [E mail :cedamsafety@kseb.in]
13. Chief Engineer, Dam Safety Organization, WRD, Bhopal, Madhya Pradesh [Email: sdso_bhopal@yahoo.co.in, encwrbpl@mp.nic.in]
14. Chief Engineer, Hydrology & Dam Safety, Nashik, Maharashtra [Email: cehpswnasik@gmail.com]
15. Superintending Engineer, Irrigation Circle No-II, WRD, Imphal, Manipur [Email: drip.manipur@gmail.com]
16. Addl. Chief Engineer (C), Hydro Planning, MePGCL, Shillong, Meghalaya [Email: bloomingwahlang@gmail.com, address-acehpmepgcl160@gmail.com]
17. SE, Urban Cell, O/o E-In–C, Public Health Engineering Department, Aizawl, Mizoram [Email: chhetryanup@gmail.com] phedseurban@gmail.com
18. Addl. Chief Engineer (Civil), Department of Power, Kohima, Nagaland [Email: addlcec.kohima@gmail.com]
19. Chief Engineer, Dam Safety, Bhubaneswar, Odisha [Email: cedamsafety.odisha@gmail.com]
20. Chief Engineer, SDSO, WRD, Punjab [Email: cesdsopb@gmail.com]
21. Chief Engineer, SDSO, Water Resources Department, Jaipur, Rajasthan [Email: ceswrpd.wr@rajasthan.gov.in]
22. Chief Engineer, SDSO, Water Resources Department, Chennai, Tamil Nadu [Email: ceomwro@gmail.com]
23. Chairman SDSO & Superintending Engineer-I(Civil) , Power Department, Government of Sikkim, [durgakamalrai@gmail.com]
24. Chief Engineer, Central Designs Organisation, I&CAD Department, Hyderabad, Telangana [Email: sdsotelangana2022@gmail.com]
25. Managing Director, Tripura Power Generation Ltd., Banamalipur, Agartala, Tripura [Email: managing.director@tsecl.in]
26. Chief Engineer, Dam Safety, I&WR Department, Lucknow, Uttar Pradesh

[Email: cedesigniduplu-up@nic.in] ce.sdsoidup-lu@up.gov.in

27. Chief Engineer, State Dam Safety Organization. Irrigation Dept, Dehradun, Uttarakhand [Email: ce.ddn.id@gmail.com]
28. Chief Engineer (Design & Research), Irrigation & Waterways Directorate, Govt. of West Bengal. Kolkata [Email: ce-dr@wbiwd.gov.in]
29. Chief Engineer, APWD, A&N Administration, Raj Niwas, Port Blair-744101 [ceapwd@and.nic.in; secretary.shipping.pwd.201@gmail.com].
30. Sr General Manager, Civil, Jammu Kashmir Power Development Corp. [Email:babbisharma803@gmail.com]
31. Chief Engineer, Office of the Chief Engineer, PHE I&FC, Head Quartered at Kargil, Government of Ladakh-194103. [Email: cepheifcladakh@gmail.com]

<u>Regulation 54(2)(s):</u> ***the measures necessary to ensure dam safety by every owner of dam other than specified dams under section 46.***

The following necessary measures should be taken to ensure dam safety of dam other than specified dams. Here in after called non-specified dam.

1 **Measures for non-specified dams having Maximum Water Level less than 3m above Natural Ground Surface**

A) The owner of the non-specified dam shall be in accordance with provisions of section 4 (s) of the Act.

B) SDSOs shall create a unique ID for such non-specified dams in their jurisdiction and maintain the database of such dams

C) The dam owners of such specified dams shall carry out inspections of such dams through appropriate officers/staff.

D) The inspection shall be carried once in a year. The inspection report would contain a note on the safety of the dam and its appurtenant structures including hydro-mechanical parts and should be submitted to dam owner for taking necessary measures suggested in the report. The proforma for the inspection report for such non-specified dams is at **Annexure-I**

E) All dam owners of such dams shall submit the annual inspection report of such dams to SDSO.

F) For dam construction, every agency shall undertake the quality control measures as specified by regulation 54 (2) (f) of Dam Safety Act, 2021.

2 **Measures for non-specified dams having Maximum Water Level equal to or more than 3m above Natural Ground Surface**

The owner of the non-specified dam shall be in accordance to section 4 (s) of the Act.

A) SDSOs shall create a unique ID for every non-specified dams in their jurisdiction and maintain the database of such dams

B) The non-specified dams shall be inspected for dam safety by the personals possessing minimum qualification of diploma in engineering or equivalent. The dam safety inspection shall cover dam and its appurtenant structure.

C) Carry out inspections.

Inspection of a Non-specified dam shall be recorded in following manner

i) Every non-specified earthen/Rockfill dam inspection shall be recorded in the Form specified in Annexure-II.

ii) Every non-specified concrete/Masonary dam inspection shall be recorded in the Form specified in Annexure -III.

iii) In addition to Annexure II / II, for every non-specified dam having hydro-mechanical components, inspection shall also be recorded in the Form specified in Annexure -III.

iv) The inspections shall also be carried out at least once every year. The filled inspection form shall be shared with the concerned SDSO and the same shall be kept with the dam owner.

v) The special inspections shall also be carried out immediately in case if any sign of distress or unusual behaviour is noticed in the dam.

D) For dam construction, every agency shall undertake the quality control measures as specified by regulation 54 (2) (f) of Dam Safety Act, 2021.

E) Engineers to be employed for the purpose of investigation, design and construction of dams other than specified dams. –

Any construction or alteration of a dam shall be undertaken subject to investigation, design and construction being done by the competent engineers having the qualification and experience as specified in the table below;

Sl. No.	**Designation**	**Qualification and experience**
(1)	**(2)**	**(3)**
1.	Survey or Investigation Engineer	Graduation or Diploma in Civil Engineering or Geology from a recognised University or Institution, possessing minimum two years' experience in survey investigation of Water Resource Projects.
2.	Dam Design Engineer (Concrete or Masonry or Earth or Rockfill Dam), as the case may be	Graduation in Civil Engineering from a recognised University or Institution, possessing minimum two years' experience in Planning and Designs of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.
3.	Geologist	Graduation in Geology from a recognised University or Institution, possessing minimum two years' of field experience in Geological investigations of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.
4.	Hydrologist	Graduation in Civil Engineering from a recognised University or Institution, possessing minimum two years' experience in Hydrology related areas.
5.	Hydro Mechanical Engineer	Graduation in Civil or Mechanical Engineering from a recognised University or Institution, possessing minimum two years' experience in design or execution of Hydromechanical works in Water Resources projects.
6.	Electrical Engineer	Graduation in Electrical Engineering from a recognised University or Institution, possessing minimum two years' experience in design or execution of Electrical works in Water Resources projects.
7.	Material or Quality	Graduation in Civil Engineering from a recognised University or

Sl. No.	Designation	Qualification and experience
(1)	(2)	(3)
	control Engineer	Institution, possessing minimum two years' experience in quality control aspects of Concrete or Masonry or Earth or Rockfill Dams, selection of quarry or material etc.
8.	Instrumentation Engineer	Graduation in Civil or Mechanical or Electrical or Electronics and Instrumentation Engineering from a recognised University or Institution, possessing minimum two years' experience in Instrumentation planning, technical specification of instruments and analysis of instrumentation data of Concrete or Masonry or Earth or Rockfill Dams.
9.	Dam Break Analysis and Emergency Action Plan Engineer	Graduation in Civil Engineering from a recognised University or Institution, possessing minimum two years' experience in hydrological and hydraulic modelling using relevant advance modelling tools, Dam Break Analysis, Flood Routing, Inundation Mapping, preparation of Emergency Action Plan etc.
10.	Dam construction or rehabilitation Engineer (Concrete or Masonry or Earth or Rockfill Dam, as the case may be)	Graduation in Civil Engineering from a recognised University or Institution, possessing minimum two years' experience in construction or rehabilitation of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.

F) The dams shall be designed as per the latest relevant IS codes.

Annexure-I

Inspection Form For Non Specified Dam

Dam Name Dam File #: _

Inspection Date:_____ Type of Inspections: _____

Inspected by: _____ Other Participants: _____

Embankment structure						
IS/ARE THERE ANY APPARENT	PREVIOUS INSPECTION			CURRENT INSPECTION		
CRACKS	Y	N	NA	Y	N	NA
1 Embankment cracks on the crest?						
2 Embankment cracks on the upstream slope?						
3 Embankment cracks on the downstream slope?						
STRUCTURAL PROBLEMS						
4 Settlement on the crest?						
5 Slough, slides or bulges on the upstream slope?						
6 Slough, slides or bulges on the downstream slope?						
7 Slough, slides or bulges on the reservoir shore?						
8 Slough, slide or erosion of spillway channel?						
9 Sinkhole on crest?						
10 Sinkhole on the upstream slope?						
11 Collapse on the downstream slope?						
12 Displaced or broken-down riprap armour?						
SEEPAGE						
13 Wet areas or seepage on downstream slope or toe?						
14 Ponded water at the downstream toe?						
15 Wet areas or seepage along downstream abutments?						

	CONCRETE/MASONRY STRUCTURE					
Are the following components of your dam in *SATISFACTORY CONDITION*? Yes or No?						
INDICATOR	PREVIOUS INSPECTION			CURRENT INSPECTION		
	Y	N	NA	Y	N	NA
1.Alignment						
2.Joint Filler						
3.Concrete/masonry						
4.Drains						
5.Public safety signs						
6. Seepage						
7. External Erosion						

8. Cracks						
9. Settlement						
10. Horizontal Movement						
11. Excessive Debris						
12. Gates						

Comment on any problems, concerns or deficiencies found:

Signature

Annexure-II

Inspection Form For a Non Specified Earthen dam Dam

Dam Name:_____ Dam File #: _____

Inspection Date:_____ Type of Inspections: l_____

Name of head of the team:_____ Other Participants: _____

Was the spillway flowing? If yes, what was the water depth over the spillway sill? _____
If no, how far was the water below the spillway sill level? _____

Was the low-level outlet open? If yes, what was the approximate discharge rate? _____

If you find deficiencies with any component of your dam, use the following table to guide you to the relevant section of this self-help section.

IS/ARE THERE ANY APPARENT	PREVIOUS INSPECTION			CURRENT INSPECTION		
CRACKS	Y	N	NA	Y	N	NA
16 Embankment cracks on the crest?						
17 Embankment cracks on the upstream slope?						
18 Embankment cracks on the downstream slope?						
VEGETATION GROWTH AND DEBRIS						
19 Excessive vegetation growth on embankments/crest?						
20 Floating debris?						
21 Vegetation or debris blocking the spillway channel?						
STRUCTURAL PROBLEMS						
22 Settlement on the crest?						
23 Slough, slides or bulges on the upstream slope?						
24 Slough, slides or bulges on the downstream slope?						
25 Slough, slides or bulges on the reservoir shore?						
26 Slough, slide or erosion of spillway channel?						
27 Sinkhole on crest?						
28 Sinkhole on the upstream slope?						
29 Collapse on the downstream slope?						
30 Displaced or broken-down riprap armour?						
SEEPAGE						
31 Wet areas or seepage on downstream slope or toe?						
32 Ponded water at the downstream toe?						
33 Wet areas or seepage along downstream abutments?						
ANIMAL ACTIVITY						
34 Signs of livestock traffic across dam embankment?						
35 Rodent burrows in dam embankment?						

IS/ARE THERE ANY APPARENT	PREVIOUS INSPECTION			CURRENT INSPECTION		
36 Beaver dams in reservoir or across spillway channel?						
OUTLET PROBLEMS						
37 Outlet operating problems?						
38 Deterioration of the outlet conduit?						
39 Hole in conduit?						
SPILLWAY PROBLEMS						
40 Spillway blockage?						
41 Channel blockage?						
42 Inadequate capacity?						

Comment on any problems, concerns or deficiencies found:

Note:-

1. **In case of any Yes for current inspection in Table-2, the matter should immediately refer to dam owner to appoint an dam safety expert to look into the problem and suggest remedial measures.**
2. **In case of any Yes for both current and previous inspection in Table-1, the matter should immediately refer to the highest level in the project for the deemed fit action for the safety of the dam.**

Signature

Annexure-III

Inspection Form For a Non Specified Concrete/masonry Dam

Dam Name:_____ Dam File #: _____

Inspection Date:_____ Type of Inspections: Pre/Post/special

_____ Name of head of the team:_____

Other Participants: _____

Was the spillway flowing? If yes, what was the water depth over the spillway sill? _____

If no, how far was the water below the spillway sill level? _____

Was the low-level outlet open? If yes, what was the approximate discharge rate? _____

Table-1

Are the following components of your dam in *SATISFACTORY CONDITION*? Yes or No?

INDICATOR	CONCRETE/MASONRY STRUCTURE					
	PREVIOUS INSPECTION			CURRENT INSPECTION		
	Y	N	NA	Y	N	NA
1.Alignment						
2.Joint Filler						
3.Concrete/masonry Condition						
4.Drains						
5.Public safety signs						
	OUTLET					
1.Outlet Pipe						
2.Energy Dissipater						
3.Stilling Basin						
4.Drains						
5.Outlet Channel						
6.Measuring Weir						
7.Outlet Controls						
8.Gates						
	SPILLWAY					
1.Debris Boom						
2.Entrance						
3.Sill						
4.Apron						
5.Walls						
6.Channel						
7.Channel Slopes						
8.Gates						

Were any of the following *POTENTIAL PROBLEM INDICATORS* found?

INDICATOR	CONCRETE/MASONRY STRUCTURE						OUTLET						SPILLWAY					
	PREVIOUS INSPECTION			CURRENT INSPECTION			PREVIOUS INSPECTION			CURRENT INSPECTION			PREVIOUS INSPECTION			CURRENT INSPECTION		
	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA
a) Seepage																		
b)External Erosion																		
c) Cracks																		
d) Settlement																		
e)Horizontal Movement																		
f) Excessive Debris																		
g) Vegetation																		

Comment on any problems, concerns or deficiencies found:

Note:-

1 In case of any No for current inspection in Table-1, the matter should immediately refer to maintenance team of the Project and dam owner for the immediate rehabilitation.
2 In case of any No for both current and previous inspection in Table-1, the matter should immediately refer to the highest level in the project.
3 In case of any Yes for current inspection in Table-2, the matter should immediately refer to dam owner to appoint a dam safety expert to look into the problem and suggest remedial measures.
4 In case of any Yes for both current and previous inspection in Table-1, the matter should immediately refer to the highest level in the project for the deemed fit action for the safety of the dam.

Signature

Annexure-IV

Inspection of HM Components in Dams:

1. Is the Gate operation smooth & trouble-free without much noise? Y/N
2. Is there excessive vibration in gate and structure during operation? Y/N
3. If yes, at what gate opening & water level --------
4. Is Stoplog/Bulkhead/maintenance gate available? Y/N
5. Is DG set or power backup available at dam sites for gate operation? Y/N
6. Is the painting of gates & hoists satisfactory? Y/N

Condition of below mentioned HM components shall be examined:

Spillway Radial Gates:					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Gate Leaf, Arms and girders	Check skin plate, girders, and stiffeners for pitting, scaling and corrosion			
		Check for corrosion of joints between (1) arms & girders (2) girders & skin plate or stiffeners (3) stiffeners & skin plate			
		Check lifting bracket and lifting pins for its soundness			
		Check welding joints of arm, girders, bracings, skin plate for cracks and other defects			
		Check bolted joints for tightness			
2	Rubber Seals	Checked for damage, leakages etc.			
3	Guide Rollers	Checked for free rotation of guide rollers			
4.	Trunnion	Check for creaking noise from trunnion during operation. If yes, lubricate. In case sound persists, investigate			
		Check weld between yoke girder and tie flats or tie rods			
		Check soundness of thrust blocks			
		Check for accumulation of water in yoke girder and thrust block. If so, drain			
5	Embedded parts like sill beam & wall plate	Check for damage, excessive pitting, welding damage			

Vertical Lift Gates					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Embedded Parts	Check for damage, excessive pitting, welding damage			
		Check for damage to concrete behind wheel/ slide track			
2	Gate Leaf	Check skin plate, girders, and stiffeners for pitting, scaling and corrosion			
		Check for corrosion of joints between (1) girders & skin plate or stiffeners (2) stiffeners & skin plate			
		Check lifting bracket and lifting pins for its soundness			
		Check welding joints of girders, bracings, skin plate for cracks and other defects			
3	Rubber Seals	Checked for damage, twist, deformation, leakages etc.			
4	Wheel	Check the wheels for easy rotation. Lock plates are properly bolted			
5	Guide Shoes	Checked for any Damage and misalignment			

Rope Drum Hoist and gantry cranes					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Wire Rope	Check for damaged strands			
		Check for lubrication			
		Check for unequal tension			
2	Turn Buckles & Rope Socket	Check for any sign of failure /damage/ rusting			
		Check for lubrication of turn buckle threads			
3	Pulley	Check for rotation. Lubricate bush & pin, if required			
4	Line Shaft	Check for straightness and alignment			
5	Gear & Pinion	Check for uneven wear, cracks & defects			
		Check for lubrication			
6	Brakes	Check for damaged or worn-out brake lining of EM brakes			
		Check for oil and smooth operation of thruster brake			

Rope Drum Hoist and gantry cranes					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
7	Plummer Block and Bearings	Check for damage			
		Check for lubrication			
8	Worm gear reducer	Check for oil levels			
		Check for tightness and wear of coupling			
9	Electric Motors	Measure the current drawn by electric motor			
		Check for undue vibrations/ sound			
9	Electrical connections	Check all electrical connection of hoist motor, brake, starter, limit switch, etc. for loose connection, proper insulation			
10	Structure, frame	Check all bolted joints for tightness and welding joints for cracks or other defects			

4.	**Hydraulic Hoist & HPU**				
S.No.	**Component**	**Inspect for**	**ɒndition**	**Action**	**Remarks**
1	Hydraulic cylinder	Check for leakage from seals at rod end.			
2	Piping/Hoses	Check for tightness and leakage			
3	Oil tank	Check for oil level. It should be above the minimum level when gate is in closed position			
		Check for oil viscosity and contamination.			
4	Pressure line filter and return line filter	Check for clogging			
5	Pressure Switches and relief valves	Check for pressure settings			
6	Pump motor	Check for alignment and excessive noise/sound.			
7	Electrical connections	Check for damages, loose connections			

Additional Comments: