**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| 1. | 2. (1), (ii). | "Protection for exposure" means fire protection for structures on property adjacent to liquid storage. | Acceptable. However, the definition needs to be broadened. | "Protection for exposure" definition need to cover "exposure to Fire as well as radiation during radiography test (for protection of human and sensitive gauges like Nucleonic gauges being used in DCU/CCR etc.). |
| 2. | 2. (1), (pp) | "Vessel" means a pressure vessel used for more than 1000 liters water capacity for storage or transportation of LPG, gases etc | Not acceptable for likely ambiguity in the definitions of "Vessel" and "Pressure Vessel" described in the standard. | In view of the definition provided for "Pressure vessel" at 2 (1) (gg) the definition of vessel may be modified. In line with SMPV Rules, 1981 i.e "Vessel" means pressure vessel. |
| 3. | 1.2 e | Alternative access shall be provided for each facility so that it can be approached by emergency responders. at road junctions shall be designed to facilitate movement of the largest fire-fighting vehicle in the event of emergency. | Part of the descriptions is missing. | Description is incomplete. |
| 4. | 1.3.1 (b) | Process unit(s), tank farm, loading gantry, solid storage, utilities, Effluent Treatment Plant (ETP), Emergency DG sets and approach roads should be located on high ground to avoid flooding. | To be reviewed as indicated in Column (D) | "ETP should be located on high ground"- needs review in context to the Clause 1.3.1 (n) |

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|---|---|---|---|---|
| 5. | 1.3.1 (n) (page-9) | Separate collection system should be provided for different types of waste generated in the process plant such as oily water, caustic, acid effluents, fecal etc. Effluent Treatment Plant should be located minimum one block away from process unit area, downwind of process units and important areas considering odour & emission of volatile organic compound. This should be closer to disposal point by the side of the boundary and at lower grade to facilitate gravity flow of effluent. | | Descriptions needs review wrt Cl. 1.3.1 (b) |
| 6. | 8(1) Page no.5 | There shall be a system for ensuring compliance to the provision of these regulations through conduct of technical and safety audits during the construction, pre-commissioning and operation phase. | Acceptable with revision as reason mentioned in column D | OISD conducts Pre Commissioning safety Audit and External Safety Audit during Operation phase. Technical and Safety Audit during Construction phase needs to be defined for contractual obligations.<br><br>Most of the technical requirements are covered in OISD Standards. |
| 7. | Clause 8 Default and Consequences | (2) In case of any deviation or shortfall including any of the following defaults, the entity shall be given time limit for rectification of such deviation, shortfall, default and in case of non-compliance, the entity shall be liable for any penal action under the provisions of the Act or | Acceptable with modification:<br><br>In case of any deviation or shortfall including any of the following defaults, the entity shall be given **reasonable** time limit for rectification of such deviation, shortfall, default and | |

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|---|---|---|---|---|
| | | termination of operation or termination of authorization. | in case of non-compliance, the entity shall be liable for any penal action under the provisions of the Act or termination of operation or termination of authorization. | |
| Schedule 1 | | | | |
| 8. | 1.4.1 (q) Page no.10 | Vent from Blow down facility shall be minimum 6m above the highest equipment falling with in radius of 15 m from the vent stack. | Acceptable with modification:<br><br>**The height of Vent shall be 3 metres above the nearest tallest structure within 15 metres radius.** | In line with OISD-Std-109, |
| Schedule-3 | | | | |
| 9. | 3.1 | Mechanical completion of all Refinery projects | To be revised as indicated in Note (a) | |
| 10. | 3.2 (a) | To enable a smooth transition from construction to com-missioning it is required to complete construction work in small packages, generally known as systems. This enables Pre-Commissioning work to progress from an earlier point in the schedule, thus reducing the final pre-commissioning peak workload substantially. Defining the systems becomes more important | Acceptable with modification<br><br>To enable a smooth transition from construction to ~~com-missioning~~ **commissioning** it is required to complete construction work in small packages, generally known as systems. This enables Pre-Commissioning work to progress from an earlier point in | |

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|---|---|---|---|---|
| | | due to: | the schedule, thus reducing the ~~final pre-commissioning~~ **commissioning** peak workload substantially. Defining the systems becomes more important due to: | |
| 11. | 3.2 (b) (i) | Not relevant to regulation Systems should be defined by color coding of P&IDs. System boundaries should be "flagged" in RED and system numbers should be clearly marked at regular intervals on the respective line-work and equipment. | To be deleted | |
| 12. | 3.2 (new clause) | | Additional clause to be added:<br><br>**The process and non-process areas of the unit should be divided into system. A set of P&IDs must be marked up with system with color codes and system boundaries should be flagged. System number should be clearly marked at regular intervals on the respective line and** | |

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|---|---|---|---|---|
| | | | **equipment** | |
| 13. | 3.3 (5) | To achieve these commissioning group representatives will attend and provide input at P&ID reviews, HAZOP Reviews and Model Reviews: They will also review cause and effect diagrams and spare parts orders. | Acceptable with modification:<br><br>To achieve these commissioning group representatives will attend and provide input at P&ID reviews, HAZOP Reviews and Model Reviews: They will also review cause and effect diagrams and ~~spare parts orders~~. | |
| 14. | 3.3(6) | The Main lists of the procedures to be carried out are:<br><br>i) Mechanical Preparation<br>ii) Flushing of equipment and piping<br>iii) Chemical Cleaning Instructions<br>iv) Physical Cleaning Instructions Mechanical Restoration<br>v) Run in Tightness test<br>vi) Electrical testing/functional tests/energizing<br>vii) Instruments calibration and functional test<br>viii) Loading of chemicals<br>ix) Loading of catalyst<br>x) Heaters drying | Following points to be added :<br><br>**xii) Inertization of the system with N2.**<br>**xiii) Dryout of the system and integrity checks of the reactor internals**<br>**xiv) Mechanical Run test (MRT)**<br>xv) **Vacuum test** | |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | xi) Chemicals boil out of steam generation facilities Verification of Mechanical Completion | | |
| 15. | 3.5.1 (xxii) | The blow off (set) and blow down (re-seat) pressure of all relief valves should be set to the satisfaction of the Company | Not acceptable | PSV set pressure should be as per standard and design code |
| 16. | 3.5.6 | The records for flushing and blowing to approve standards of cleanliness and restoration of plant condition to P7ID requirement shall be retained in each Systems Completion Manual. | Sentence correction:<br><br>The records for flushing and blowing to approve standards of cleanliness and restoration of plant condition to ~~P7ID~~ **P&Id** requirement shall be retained in each Systems Completion Manual. | Typographical error |
| 17. | 3.6.1 | Activities in commissioning | To be revised as indicated in Note- (b) | |
| 18. | 3.6.1.1, 3.6.1.2, 3.6.1.3, 3.6.1.4, 3.6.1.5 | | Following Clauses to be elaborated: 3.6.1.1, 3.6.1.2, 3.6.1.3, 3.6.1.4, 3.6.1.5 | |
| 19. | 3.6.1.4 | Instrument and electrical testing:<br><br>This part shall be performed jointly by operations, maintenance, inspection and the vendors in line with the standard | Accepted with modifications:<br><br>This part shall be performed jointly by operations, maintenance, ~~inspection~~ and the vendors in line with the | Inspection personnel not required in instrument and electrical function testing. |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | guidelines or specified by the vendors | standard guidelines or specified by the vendors | |
| 20. | 3.6.1 (additional clause) | | Following additional clause to be added:<br><br>**Procedural Safety during special procedures like catalyst loading/ chemical handling etc. should be included in regulation.** | |
| 21. | 3.6.2 | General commissioning activities before commissioning of main process systems:<br><br>(a) Flare system<br>(b) Cooling Water system<br>(c) Steam Network / system<br>(d) Instrument Air system<br>(e) Electrical system<br>(f) Fuel Gas system<br>(g) Fuel Oil System<br>(h) Flushing Oil system.<br>(i) Plant Air system<br>(j) N2 system<br>(k) CBD/SWS System<br>(l) Fire water system and fire-fighting system<br>(m) Communication system | Following activities to be added:<br><br>(n) **BFW/DM water**<br>(o) **Condensate system**<br>(p) **OWS/ABD/CRWS and other underground system**<br>(q) **Drinking water system for safety shower** | |
| Schedule 4 | | | | |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| 22. | Schedule-4 4.4.2.4 | Develop stage: In this stage, the asset strategies are defined with an emphasis on risk mitigation. Focusses on how asset fail, the risk and impact of the failures and what is to be done on the asset to mitigate these failures. The typical methodologies are based on industry standards that includes Reliability Centered Maintenance (RCM), Failure Modes and Effects Analysis (FMEA), Risk Based Inspection (RBI), Safety Instrumented System Life Cycle Management (SLCM) and Strategy Analysis | Acceptable with revision as reason mentioned in column D | Further methodologies for remote monitoring such as IOTs, AI and ML can be included for super critical equipment. |
| 23. | 4.4.2.4 | Execute stage: In this stage, the implementation strategies are built for business benefit of an asset. The strategies should include time as well as condition based activities to be performed on the asset. This stage should also captures the documentation of the activities resulting into event recording for future references. | Acceptable with revision as reason mentioned in column D | Data acquisition through RFID can also be included for future references. |
| Schedule- 5 | | | | |
| 24. | 5.2(i) | **5.2 System Design**<br>The electrical distribution system shall be designed considering all possible factors affecting the choice of the system to be adopted such as required | Acceptable with correction:<br><br>Sl nos after 'n' to be corrected.<br><br>New point to be added: | |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | continuity of supply, flexibility of operation, reliability of supply from available power sources, total load and the concentration of individual loads.<br>The design of electrical system shall include the following:<br>i. The design of electrical system for refineries and Gas processing plants facility shall include the following:<br><br>a. Site Conditions<br>b. Details of Power source<br>c. Planning and basic power distribution system and single line diagram<br>d. Protection / metering / control<br>e. Electrical Substation design for New Substation<br>f. Electrical equipment design<br>g. Illumination System<br>h. Earthing system<br>i. Lightning protection system<br>j. Electrical equipment for hazardous area<br>k. Statutory approvals<br>l. Cable sizing<br>m. Emergency power sizing<br>n. Power system studies<br>a. Heat tracing system as applicable | **q. UPS & Battery Charger Sizing** | |

**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | b. 24V,230V,415V power out let system | | |
| 25. | 5.6.1 (b) | Substation buildings switchgear room should be Air conditioned and shall comprise elevated structures permitting the use of bottom entry switchgear with cable cellar for cable racking and trays below. MCC room building should be single floortype without cellar with pressurized switchgear room. The floor level of the MCC room shall be 1500mm above surrounding grade level. | Acceptable with modification:<br><br>Substation buildings switchgear room should be Air conditioned/ **pressurized** and shall comprise elevated structures permitting the use of bottom entry switchgear with cable cellar for cable racking and trays below. MCC room building should be single floortype without cellar with pressurized switchgear room. The floor level of the MCC room shall be 1500mm above surrounding grade level. | |
| 26. | 5.6.1 (c ) | Sub-station can also be provided without cable cellar with battery trenches similar to MCC room. | Not Acceptable | Substations must have a cable cellar. |
| 27. | 5.6.1 (d) | In large plants, the main sub-station floor shall be raised above grade level and the space below the sub-station floor shall be utilized for installation of cable trays. The substation cellar shall preferably have a clear minimum height of 3 meters. The cable cellar floor shall | Acceptable with modification:<br><br>In large plants, the main sub-station floor shall be raised above grade level and the space below the sub-station floor shall be utilized for | |

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|---|---|---|---|---|
| | | be at least 300 mm above the approach road level. The switchgear rooms should be Air conditioned/ pressurized to prevent ingress of dust & to prevent or to make more reliable heat sensitive electrical Equipment & Panels . Large substation (length greater than 60 meters) shall have three entries, one for equipment entry, second for normal entry and the third emergency exit. Whereas required normal and equipment entries can be combined. The substation shall also have an emergency door opening outward. | installation of cable trays. The substation cellar shall preferably have a clear minimum height of 3 meters. The cable cellar floor shall be at least 300 mm above the approach road level. The switchgear rooms should be Air conditioned/ pressurized to prevent ingress of dust & to prevent or to make more reliable heat sensitive electrical Equipment & Panels . ~~Large~~ **All** substations (length greater than 60 meters) shall have three entries, one for equipment entry, second for normal entry and the third emergency exit. Whereas required normal and equipment entries can be combined. The substation shall also have an emergency door opening outward. | |
| 28. | 5.6.1 (f ) | HVAC or Air Conditioning System of substation shall trip on activation of fire and gas detection signal.<br>Flooring to the Battery room and walls up to 1.0 m height shall have acid / alkaline resistant protective material | Acceptable with modification:<br><br>Flooring ~~to~~ **inside** the Battery room and walls up to 1.0 m height shall have acid / alkaline resistant protective material | Entire content needs to be broken up into two separate serial nos |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | coating/ tiling. | coating/ tiling. | |
| 29. | 5.8.6 (i) | DC Supply Units<br><br>i) Each DC power supply system shall include redundant charger-cum-rectifier, battery and DC distribution board. DC link in the UPS system shall not be tapped for DC instrumentation power supply except in rare circumstances. | Acceptable with modification:<br><br>Each DC power supply system shall include redundant charger-cum-rectifier, battery and DC distribution board. DC link in the UPS system shall not be tapped for DC instrumentation power supply ~~except in rare circumstances~~. | DC charger & UPS are critical systems and should not be mixed so that both system fail in case of UPS failure. |
| 30. | 5.8.6 (ii) | A 2 x 50% battery bank configuration should be provided. | Acceptable with modification:<br><br>A 2 x ~~50%~~ **100%** battery bank configuration should be provided. | This is required to ensure proper back up at any time/ shutdown of any charger. |
| 31. | 5.8.6 (b) | DC Instrumentation Shutdown System<br><br>This shall in general be sized for 30 minutes, unless otherwise required. | Acceptable with modification:<br><br>This shall in general be sized for ~~30~~ **60** minutes, unless otherwise required. | This is required as sufficient time is required for taking shutdown of the critical process units. |
| 32. | 5.8.6 ( d) | Battery shall be Nickel Cadmium/flooded electrolyte Lead Acid/VRLA type designed as per design specifications. | Acceptable with modification:<br><br>Battery shall be Nickel Cadmium/flooded electrolyte Lead Acid/~~VRLA~~ type designed | This is required as VRLA batteries are not reliable and not to be used in critical systems. |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | | as per design specifications. | |
| 33. | 5.8.7(ii) | Under normal conditions, the rectifier-cum-charger shall feed the inverter and charge the battery set. In case of mains failure, the battery shall supply the necessary power to the inverter. The inverter in turn feeds the load through the static switch. If the inverter malfunctions or is overloaded, the load shall be instantaneously transferred to the by-pass line through the static switch. The inverter shall be operated in synchronized mode with the by-pass line, and manual forward transfer or manual reverse transfer shall be effected without any break.<br>Battery for UPS system shall be sized for 30 minutes unless otherwise specified. | Acceptable with modification:<br><br>Under normal conditions, the rectifier-cum-charger shall feed the inverter and charge the battery set. In case of mains failure, the battery shall supply the necessary power to the inverter. The inverter in turn feeds the load through the static switch. If the inverter malfunctions or is overloaded, the load shall be instantaneously transferred to the by-pass line through the static switch. The inverter shall be operated in synchronized mode with the by-pass line, and manual forward transfer or manual reverse transfer shall be effected without any break.<br>Battery for UPS system shall be sized for ~~30~~ **60** minutes unless otherwise specified. | This is required as sufficient time is required for taking shutdown of the critical process units. |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| 34. | 5.8.9 (iii) | Converter and rectifier equipment controlling plant motors shall be located inside the substation, except the associated transformers and reactors, which shall be located within the substation building next to VFD panels. For very large rated VFD , the transformer and/ or reactor should be located in outdoor transformer bay. | Acceptable with modification:<br><br>Converter and rectifier equipment controlling plant motors shall be located ~~inside the substation~~, **within the substation building outside the VFD room** except the associated transformers and reactors, which shall be located within the substation building next to VFD panels. For ~~very~~ large rated VFD , the transformer and/ or reactor should be located in outdoor transformer bay. | This is required as the transformer and reactor shall generate heat load and may affect the air conditioning of the VFD room. |
| 35. | 5.8.10(ii) | All LV motors shall be complying to IE2 Class of efficiency unless otherwise specified in Motor Datasheet | Acceptable with modification:<br><br>All LV motors shall be complying to ~~IE2~~ **IE3** Class of efficiency unless otherwise specified in Motor Datasheet | |
| 36. | 5.9.1 (ix) | LED lamps shall generally be used for outdoor plant lighting.. LED lamps can be considered for emergency lighting to achieve this objective. Fluorescent lamps/LED may be used for indoor lighting in non-process buildings and control rooms. Safe area street lighting and yard lighting may use sodium | Acceptable with modification:<br><br>LED lamps shall generally be used for outdoor plant lighting.. LED lamps can be considered for emergency lighting to achieve this objective. ~~Fluorescent lamps~~/LED may be | |

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| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| | | vapour/LED lamps. Sodium vapour lamps shall not be installed in hazardous areas. | used for indoor lighting in non-process buildings and control rooms. Safe area street lighting and yard lighting may use sodium vapour/LED lamps. Sodium vapour lamps shall not be installed in hazardous areas. | |
| 37. | 5.9.3 | Power and Convenience Outlets<br>i. Adequate no of 415 V 63 A. TP& N+E power outlets of switched socket type shall be provided at suitable locations to ensure accessibility.<br><br>240 V, 16 A,SP&N+E convenience outlets at suitable locations. | Following clause to be added:<br><br>**24 volt Hand lamp points to be provided at select locations for usage.** | |
| 38. | 5.9.4.2 (xiv) | All Cable glands for Equipment located in hazardous area shall be flame proof type.<br>No underground power cables exceeding 33kV shall be laid without minimum depth of 1200 mm. Top most cable trays & vertical cable trays shall be provided with GI covers. Further bottom tray covers shall be provided wherever cable tray are routed through process pipes or equipment. | Acceptable with modification:<br><br>No underground power cables exceeding ~~33kV~~ **1.1 kV** shall be laid without minimum depth of 1200 mm. Top most cable trays & vertical cable trays shall be provided with GI covers. Further bottom tray covers shall be provided wherever cable tray are routed through process pipes or equipment. | This is required as all HT cables above voltage grade of 1.1 KV should be laid at a minimum depth of 1200 mm. |
| Schedule-8 | | | | |

**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| 39. | 8.15 | Each entity shall maintain training and competency assessment and assurance records -<br>(i) provide evidence that the training programs required by this subpart have been implemented; | Acceptable with modification:<br><br>Each entity shall maintain training and competency assessment and assurance records -<br>(i) provide evidence that the recommended training programs required by this sub part **are also part of entity's Training need identifications and have been implemented;** | |
| Schedule-9 | | | | |
| 40. | 9.2.1 | Types of Safety Audits | Acceptable with revision as reason mentioned in column D | 2 types are proposed whereas only 1 type of audit is included |
| Schedule-12 | | | | |
| 41. | 12.1.3<br>Page No. 97 | Training should focus on use of the permit-to-work system but shall also ensure that the individual understands the working environment, the hazards associated with it, and more importantly, the controls required to appropriately manage the risks presented by those hazards. | Following to be added:<br><br>Frequency of training to all permit issuer and receiver should be provided at-least every two years<br><br>Following to be corrected:<br><br>Training should focus on use of the **Online** permit-to-work system but shall also ensure that the individual understands | |

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|---|---|---|---|---|
| | | | the working environment, the hazards associated with it, and more importantly, the controls required to appropriately manage the risks presented by those hazards. | |
| Schedule-13 | | | | |
| 42. | 13.1.1. Page No. 106 | **Emergency Planning and Response-** A comprehensive Emergency Response and Disaster Management Plan (ERDMP) shall be developed in accordance to the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP)) Regulations, 2010. The copies of the ERDMP shall be maintained at each petroleum installation. | Acceptable with modification:<br><br>**Emergency Planning and Response-** A comprehensive Emergency Response and Disaster Management Plan (ERDMP) shall be developed in accordance to the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP)) Regulations, 2010.**Scope covered in ERDMP is exhaustive and includes the requirement of Factories Act-1948.** The copies of the ERDMP shall be maintained at each petroleum installation | |

**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| S. No | Clause No of draft regulation (A) | Description in the draft regulation (B) | Whether acceptable or not (C) | Reasons / Justification (D) |
|---|---|---|---|---|
| 43. | 13.1.1.3 (xv) | External audits shall be conducted at least every three years by external professionals not involved in the work of the SMS or the operations being audited. The auditors could be external parties such as professional auditors, subject matter experts, or peer operators. | Para to be redrafted as following:<br><br>**As per MSIHC rules 1989, Rule no. 10 (4) & (6), safety audit is to be conducted once a year by an expert, not associated with such industrial activities.**<br>**As per factory Act-1948, MAH industries shall be subjected to External Safety Audit once in Two years and during Intervening years Internal Safety Audit to be carried out.** | |

**Note**:

a) Clause 3.1 to be revised as follows:

Mechanical Completion activities consist of all non-operating activities. A typical list might be as follows:

| S. No | Mechanical Completion Items | Constructors | Operations | PMC |
|---|---|---|---|---|
| 1 | Installation of piping and equipment | Perform | Witness | Approval |

**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| | | | | |
|---|---|---|---|---|
| 2 | Integrity (hydrostatic/ pneumatic) testing | Perform | Witness | ~~Witness~~ Approval |
| 3 | Equipment Inspection (Towers, Reactors, etc.) and Boxup | Perform | Witness | ~~Witness~~ Approval |
| 4 | Develop Punch List | Liquidate | Perform | ~~Witness~~ Approval |
| 5 | Cold alignment checks | Perform | Witness | ~~Witness~~ Approval |
| 6 | Point to Point continuity checks | Perform | Witness | ~~Witness~~ Approval |
| 7 | Removal of free water from systems | Perform | ~~Perform~~ Witness | ~~Witness~~ Approval |
| 8 | Preservation and maintenance | Perform | ~~Perform~~ Witness | ~~Witness~~ Approval |

Also, such MC completion categorization depends upon type of contract between Client, Contractor and PMC whether contract is LSTK, conventional or any other mode.

b) Clause 3.6.1 to be revised as below:

| S. No | Activities | Constructors | Operations | PMC |
|---|---|---|---|---|
| 1 | Operational Tightness testing | Perform | ~~Perform~~ Witness | ~~Witness~~ Approval |
| 2 | Flushing of Utility systems | Perform | ~~Perform~~ Witness | ~~Witness~~ Approval |

**IOCL Comments on "Draft PNGRB (Technical Standards and Specifications including Safety Standards for Refineries and Gas Processing Plants) Regulations, 2020" are as below:**

| | | | | |
|---|---|---|---|---|
| 3 | Loading of Desiccants and Catalysts | Perform | ~~Perform~~ Witness | ~~Witness~~ Approval |
| 4 | Start-up/commissioning of major equipment | | Perform | Witness |
| 5 | Drying out and inerting | | Perform | Witness |
| 6 | Instrument and electrical function testing | | Perform | Witness |
| 7 | Function testing of safety systems | | Perform | Witness |

Such activities depend upon type of contract between Client, Contractor and PMC whether contract is LSTK, conventional or any other mode.