Amendments in NGPL IMS Regulations			
Sl.	**Clause No.**	**Existing clause**	**Proposed clause**
1	2. Definitions	1.(e) “risk” means the risk as defined under the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP) Regulations, 2010;	1.(e) “risk” means the measure of potential loss in terms of both the incident probability (likelihood) of occurrence and the magnitude of the consequences.
2	2. Definitions	1 (f) “risk analysis” means the risk analysis as defined under the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP) Regulations, 2010;	
3	2. Definitions	1.(g) “risk assessment” means the risk assessment analysis as defined under the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP) Regulations, 2010;	1.(g) “risk assessment” means a systematic process in which potential hazards from facility operation are identified, and the likelihood and consequences of potential adverse events are estimated. Risk assessments can have varying scopes, and can be performed at varying levels of detail depending on the operator’s objectives
4	2. Definitions	1.(h) “risk management” means the risk management as defined under the Petroleum and Natural Gas Regulatory Board (Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP) Regulations, 2010;	1.(h) "risk management" means an overall program consisting of identifying potential threats to an area or equipment; assessing the risk associated with those threats in terms of incident likelihood and consequences; mitigating risk by reducing the likelihood, the consequences, or both; and measuring the risk reduction results achieved.
5	2. Definitions		"transmission pipeline " means one or more segments of pipeline usually interconnected to form a network that transports gas from a gathering system, the outlet of a gas processing plant or a storage field to a high, medium or low-pressure pipeline system, a large-volume customer or another storage field; "sub transmission pipeline" means a high pressure pipeline connecting the main natural gas pipeline to the city gate station
6	2. Definitions	1.(k) “right of use (ROU) or right of way (ROW)” means the area or portion of land within which the pipeline operator or owner has acquired the right through the relevant provisions of law or in accordance with the agreement with the land owner or agency having jurisdiction over the land to lay and operate the natural gas pipelines;	1.(k) “right of user (ROU) ” means the area or portion of land within which the pipeline operator or owner has acquired the right through the relevant provisions of law or in accordance with the agreement with the land owner or agency having jurisdiction over the land to lay and operate the natural gas pipelines;
7	2. Definitions		(o) “Shall” indicates that the provision in which it occurs is mandatory; (p) “Should” Indicates that the provision in which it occurs is recommendatory but not mandatory; Other definitions / terminologies used for integrity assessment like anomaly, defect, MAOP etc. not defined above, shall be as defined in ASME 31.8S.
8	4. Scope.	These regulations shall cover all the existing and new natural gas transmission pipelines, spur lines, sub-transmission pipelines (STPL) and dedicated pipelines. This includes the associated facilities required for transportation of natural gas through pipelines that is terminals, intermediate pigging facilities, compressor stations, sectionalizing valves etc.	These regulations shall cover all the existing and new natural gas transmission pipelines, spur lines, sub-transmission pipelines (STPL) and dedicated pipelines. This includes the associated facilities required for transportation of natural gas through pipelines such as terminals, intermediate pigging facilities, compressor stations, sectionalizing valves etc.

9	7.Default and consequences	2 (i) the entity shall be required to complete each activity within the specified time limit and if there is any deficiency in achieving in one or more of the activities, the entity shall submit a mitigation plan within the time limit for acceptance of the Board and make good all short comings within the time agreed by the Board. If the entity fails to complete activities within the specified time limit by the Board, relevant penal provisions of the Act shall apply;	2 (i) the entity shall be required to complete each activity within the specified time limit and if there is any deficiency in achieving in one or more of the activities, the entity shall submit a mitigation plan with time schedule for acceptance of the Board and make good all short comings within the time agreed by the Board. If the entity fails to complete activities within the specified time limit by the Board, relevant penal provisions of the Act shall apply;
10	9. Miscellaneous	(1) Through these regulations the uniform application of Integrity Management System is to be ensured for all natural gas pipelines. (2) Entity operating and maintaining natural gas pipelines shall have the qualified manpower as per three tier structure as indicated in Appendix-IV. (3) These regulations either on suo-motu basis or on the recommendation of concerned sub-committee of natural gas pipelines shall be reviewed by the Board.	(1) Through these regulations the uniform application of Integrity Management System is to be ensured for all natural gas pipelines. (2) Entity operating and maintaining natural gas pipelines shall have a written plan / philosophy of deploying qualified and trained manpower at the installations based on activities required for compliance to this regulation. (3) These regulations either on suo-motu basis or on the recommendation of concerned sub-committee of natural gas pipelines shall be reviewed by the Board from time to time.
11	SCHEDULE-1	**OBJECTIVE** The objective of Pipeline Integrity Management System is to maintain integrity of natural gas pipelines at all times to ensure public safety, protect environment and ensure availability of pipeline to transport gas without interruptions and also minimize business risks associated with accidents and losses.	**OBJECTIVE** The objective of Pipeline Integrity Management System is to maintain integrity of natural gas pipelines at all times to ensure public safety, protect environment and ensure availability of pipeline to transport gas without interruptions and minimize risk associated with accidents and losses. ....
12	SCHEDULE-1	An effective Integrity Management System shall be: • Ensuring the quality of natural gas pipeline integrity in all areas which have potential for adverse consequences. • Promoting a more rigorous and systematic management of natural gas pipeline integrity and mitigating the risk; • Increasing the general confidence of the public in the operation of natural gas pipeline. • Optimizing the life of the natural gas pipeline with the inbuilt incident investigation and data collection including review by the entity.	An effective Integrity Management System shall : • Ensure natural gas pipeline integrity in all areas which have potential for adverse consequences. • Promote a more rigorous and systematic management of natural gas pipeline integrity and mitigating the risk; • Enhance the general confidence of the public in the operation of natural gas pipeline. • Enhance the life of the natural gas pipeline with the inbuilt incident investigation and data collection including review by the entity.
13	SCHEDULE-2	2.3 .... • Quality Control:	2.3 .... • Quality Plan : .....

14	SCHEDULE-3	**3.1 PHYSICAL DESCRIPTION:** Description of natural gas pipeline should include specific description of the pipelines, compressors, valves with respect to design specifications, length, major installations details such as: 3.1.1 Trunk Pipeline 3.1.2 Spur-pipelines 3.1.3 Sectionalizing Valve Stations 3.1.4 Intermediate Pigging Stations 3.1.5 Tap-Off Stations 3.1.6 Compressor Stations 3.1.7 Control Stations 3.1.8 Electrical System depending upon Captive power generation or Grid-power. 3.1.9 Cathodic Protection System 3.1.10 SCADA 3.1.11 Safety Equipments 3.1.12 Delivery Stations	**3.1 PHYSICAL DESCRIPTION:** Description of natural gas pipeline should include specific description of the pipelines, compressor stations, valve stations and major installations details such as: 3.1.1 Transmission Pipeline 3.1.2 Spur-pipelines 3.1.3 Sectionalizing Valve Stations 3.1.4 Intermediate Pigging Stations 3.1.5 Tap-Off Stations 3.1.6 Compressor Stations 3.1.7 Control Rooms 3.1.8 Electrical System 3.1.9 Cathodic Protection System 3.1.10 Telecome / SCADA 3.1.11 Safety Equipments 3.1.12 Dispatch Terminal / Receiving Terminal
15	SCHEDULE-3	**3.2 OTHER DESCRIPTION:** 3.2.1 ROU Details-ROU width and constraints, if any 3.2.2 Interfaces with other operators' facilities or pipelines, if any; 3.2.3 Historical background of the natural gas pipeline and major modifications and additions carried out in the system, if any; 3.2.4 List of the consumers served by the pipelines; 3.2.5 Inspection updates; 3.2.6 Incident reporting; 3.2.7 Statement of compliance with Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Natural Gas Pipeline) Regulations, 2009; 3.2.8 Statutory compliances.	**3.2 OTHER DESCRIPTION:** 3.2.1 ROU Details-ROU width and constraints, if any 3.2.2 Interfaces with other operators' facilities or pipelines, if any; 3.2.3 Historical background of the natural gas pipeline and major modifications and additions carried out in the system, if any; 3.2.4 List of the consumers served by the pipelines;
16	SCHEDULE-4	4.3 A prescriptive type of Integrity Management System mandates the implementation of an established process for addressing the risks, their consequences and proven methods for mitigation. It also mandates the in-house development of Integrity Management Plan and Management of Change pertaining to technical aspects. Based on the development of gas pipeline industry in India till date, the preparation of prescriptive type Integrity Management System has been considered for implementation to all natural gas pipelines in India. Further, as the natural gas pipeline industry matures and gathers sufficient records or data as per the requirements prescribed in the Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications Including Safety Standards for Natural gas pipelines) Regulations, 2009, a review mechanism may be considered by the Board for recommending a Performance Based Integrity Management System for Natural gas pipeline.	4.3 A prescriptive type of Integrity Management System mandates the implementation of an established process for addressing the risks, their consequences and proven methods for mitigation. It also mandates the in-house development of Integrity Management Plan and Management of Change pertaining to technical aspects. However, Entity may adopt more rigorous IMP within a prescriptive IMP based on their in-house assessment. Further, as the natural gas pipeline industry matures and gathers sufficient records or data as per the requirements prescribed in the Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications Including Safety Standards for Natural gas pipelines) Regulations, 2009, the Board may consider allowing a performance based IMP during subsequent revisions of IMS document for a network.
17	SCHEDULE-5	**INTEGRITY ASSESSMENT TOOLS** Some of the tools for Integrity assessment are provided below. The operator should use as many tools necessary to achieve the IMS for natural gas pipeline. It may be noted that the baseline data for specific measurement should be available with the operator as a ready-reckoner:	**INTEGRITY ASSESSMENT, MONITORING AND SURVEYS** Some of the tools for Integrity assessment, surveys, monitoring & surveillance are provided below. The operator shall employ at least one integrity assessment tool and should use all applicable surveys, monitoring & surveillance tools necessary to achieve the IMS for natural gas pipeline. It may be noted that the baseline data for specific measurement should be available with the operator.

18	SCHEDULE-5	**Second Para from 5.6 Thickness assessment and periodic review against baseline values** The operator of a pipeline system shall develop a chart of most suited integrity assessment tool or method and assessment interval for each threat/risk and further develop appropriate specifications and quality control plan for such assessment. After establishing effectiveness of assessment, the interval of assessment may be further modified subject to any other code requirement such as Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for natural gas pipelines) Regulations, 2009. A suggested chart is placed at APPENDIX –III	**INTEGRITY ASSESSMENT, MONITORING AND SURVEYS** (continued) The operator of a pipeline system shall develop a chart of most suited integrity assessment tool, surveys, monitoring & surveillance and interval for each threat/risk and further develop appropriate specifications and quality control plan for such assessment. After establishing effectiveness of assessment, the interval of assessment may be further modified subject to any other code requirement such as Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for natural gas pipelines) Regulations, 2009. A suggested chart is placed at APPENDIX –III
19	SCHEDULE-5		**5.1 INTEGRITY ASSESMENT TOOLS** *(New Heading)*
20	SCHEDULE-5	**5.1 In-Line Inspection** In-line inspection (ILI) is an integrity assessment method used to locate and preliminarily characterize indications, such as, metal loss or deformation, as well as external and internal corrosion in a pipeline. ASME B31.8 S "Managing System Integrity for Natural gas pipelines" provides additional guidance on pipeline in-line inspection. Internal inspection tools shall	**5.1.1 In-Line Inspection** In-line inspection (ILI) is an integrity assessment method used to locate and characterize indications, such as, metal loss due to internal / external corrosion & other mechanical damage or deformation. Internal inspection tools shall .....
21	SCHEDULE-5	**5.4 HYDROTESTING** Hydro testing is appropriate for integrity assessment when addressing certain threats at the pre-commissioning stage itself at test pressure specified in the Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Natural gas pipelines) Regulations, 2009.	**5.1.2 Hydro / Pressure Testing of In-service Pipelines** Hydro / Pressure testing is appropriate for integrity assessment when addressing certain threats at the pre-commissioning stage itself at test pressure specified in the Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for Natural gas pipelines) Regulations, 2009. Hydro Testing / Pressure testing can also be employed as an integrity assessment tool during service life.
22	SCHEDULE-5	**5.5 Direct Assessment AND EVALUATION** Direct assessment is an integrity assessment method utilizing a structured process through which the operator is able to integrate knowledge of the physical characteristics and operating history of a pipeline system or segment with the results of inspection, examination, and evaluation, in order to determine the integrity. Direct assessment methods that include visual Non-Destructive Testing (NDT) examination to reinforce and validate findings from in-line inspection and other incidental findings, like during incidental pipeline exposure, pipeline damages and other maintenance activities may also be employed as an Integrity Assessment tools.	**5.1.3 Direct Assessment** Direct assessment is an integrity assessment method utilizing a structured process through which the operator is able to integrate knowledge of the physical characteristics and operating history of a pipeline system or segment with the results of inspection, examination, and evaluation, in order to determine the integrity. External Corrosion Direct Assessment (ECDA), Internal Corrosion Direct Assessment (ICDA) and Stress Corrosion Cracking Direct Assessment (SCCDA) are the available tools for direct assessment and evaluation.
23	SCHEDULE-5	**5.5.1 External Corrosion Direct Assessment (ECDA)** can be used for determining integrity for the external corrosion threat on pipeline segments. The ECDA process has the following four components: Sub paragraphs (a), (b), (c) & (d) While implementing External Corrosion Direct Assessment if the pipe is exposed, the operator is advised to conduct examinations for threats other than that for external corrosion also (like mechanical and coating damages).	**External Corrosion Direct Assessment (ECDA)** can be used for determining integrity for the external corrosion threat on pipeline segments. While implementing External Corrosion Direct Assessment if the pipe is exposed, the operator is advised to conduct examinations for threats other than that for external corrosion also (like mechanical and coating damages). Sub paragraphs (a), (b), (c) & (d)are slighly modified and moved at bottom of '5.1.3 Direct Assessment'

24	SCHEDULE-5	**5.5.2 Internal Corrosion Direct Assessment (ICDA)** can be used for determining integrity for the internal corrosion threat on pipeline segments. The ICDA process has the following four components. (a) Pre-assessment (b) Identifications (c) Examinations and evaluations (d) Post-assessment	Internal Corrosion Direct Assessment (ICDA) can be used for determining integrity for the internal corrosion threat on pipeline segments.
25	SCHEDULE-5	**5.5.3 Stress Corrosion Cracking Direct Assessment (SCCDA**) can be used for determining integrity for the stress corrosion threat on pipeline segments. The SCCDA process has the following four components. a) Pre-assessment b) Identification c) Examinations and evaluations d) Post-assessment	Stress Corrosion Cracking Direct Assessment (SCCDA) can be used for determining integrity for the stress corrosion threat on pipeline segments.
26	SCHEDULE-5	**5.5.1 sub-paras (a), (b), (c) & (d)** (a) Pre-assessment- incorporating various data gathering, database integration and analysis (b) Identification - using either tools or calculations to flag possible corrosion sites, or calls, based on the evaluation or extrapolation of the database (c) Examinations and evaluations - excavation and direct assessment to confirm corrosion at the identified sites and remediation as provided in Schedule 6 of these regulations. (d) Post-assessment - to determine if dig call decision are taken on a pipeline segment. However, Call decisions are driven by various tools, technologies, or engineering evaluations, but are highly dependent on the level of experience and expertise utilized.	Each of these assessments are carried out in four steps as below- (a) Pre-assessment- incorporating various data gathering, database integration and analysis (b) Indirect Inspection- using either tools or calculations to flag possible corrosion sites, or calls, based on the evaluation or extrapolation of the database (c) Direct/Detailed Examination- excavation and examination to confirm corrosion at the identified sites and remediation as provided in Schedule 6 of these regulations. (d) Post-assessment - to determine the fitness for service of pipeline, re-assessment interval and effectiveness of Direct Assessment.
27	SCHEDULE-5	**New Clause**	**5.1.4 Other Integrity Assessment Methodology** Other proven integrity assessment methods for pipeline may exist for use in managing the integrity of pipeline. For the purpose of these regulations, it is acceptable for an operator to use these inspections as an alternative to pressure testing or direct assessment (and where ILI is not feasible due to operational or other constraints)
28	SCHEDULE-5		**5.2 MONITORING AND SURVEYS** *(new heading)*
29	SCHEDULE-5	**5.2 Cathodic Protection (CP) Monitoring** Following cathodic protection monitoring methods are available: (i) Pipe to Soil Potential Survey / Closed Interval Potential Logging Survey. (ii) Transformer Rectifier Unit / Cathodic Protection Power Supply Module - current and voltage monitoring method (iii) Coating Health Surveys (Current Attenuation Test, Direct Current Voltage Gradient survey and Pearson) (iv) Pipeline Interference Survey	**5.2.1 Cathodic Protection (CP) Monitoring** Following cathodic protection monitoring methods are available: (i) Pipe to Soil Potential Survey (ii) Transformer Rectifier Unit / Cathodic Protection Power Supply Module - current and voltage monitoring method (iii) Closed Interval Potential Logging Survey (iv) Coating Health Surveys (Current Attenuation Test, Direct Current Voltage Gradient survey and) (v) Pipeline AC/DC Interference Survey* including survey at Foreign Pipeline Crossings, Power Transmission line crossings / parallelism and other Stray current sources * It shall be mandatory on all the entities involved to facilitate conduct studies / surveys and take mitigation measures

30	SCHEDULE-5	**5.6 Thickness assessment and periodic review against baseline values** For all sections of the pipelines above ground, all pipeline skids and pressure vessels, a periodic thickness assessment and comparison with baseline values may be done and employed as Integrity Assessment tool. The operator of a pipeline ....A suggested chart is placed at APPENDIX –III	**5.2.2 Thickness assessment and periodic review against baseline values** For all sections of the pipelines above ground, all pipeline skids and pressure vessels, a periodic thickness assessment and comparison with baseline values may be done and employed as Integrity Assessment tool. The Paragraph moved at the start of schedule 5
31	SCHEDULE-5	**5.7** Pipeline equipment Health Monitoring	**5.2.3** Pipeline equipment Health Monitoring
32	SCHEDULE-5	**5.3 Surveillance** I. Patrolling / Ground Survey II. Integrated Surveillance System for critical stretches : III. Awareness Programme:	**5.3 Surveillance** 5.3.1 Patrolling / Ground Survey 5.3.2 Integrated Surveillance System for critical stretches : 5.3.4 Awareness Programme: *(only changes in heading numbers)*
33	SCHEDULE-5	**5.8 Review of existing pipeline Class Locations:** Whole Section	Moved and modified at Section 6.1.6 (C)
34	SCHEDULE-6	**6.1 Pipeline integrity management Plan** Figure 1: Pipeline Integrity Management Plan - Flow Diagram	**6.1 Pipeline integrity management Plan** ASME B31.8S-2018, Figure 2.1-2 Integrity Management Plan Process Flow Diagram
35	SCHEDULE-6	**6.1.2 (I) Time Dependent Threats:** 1) External Corrosion 2) Internal Corrosion • Internal corrosion due to off spec. gas* also to be considered 3) Stress Corrosion Cracking *Refer the Petroleum and Natural Gas Regulatory Board (Access Code for Common Carrier or Contract Carrier Natural gas pipelines) Regulations, 2008.	**6.1.2 (I) Time Dependent Threats:** 1) External Corrosion 2) Internal Corrosion 3) Stress Corrosion Cracking
36	SCHEDULE-6	**6.1.2 (III)** 9)Weather related and outside force: i.Weather related ii.Lightening iii.Heavy Rains or Floods iv.Earth Movements Besides the above, certain other threats may be applicable based upon the land pattern: i.Creek area effects ii.Muddy land effects iii.River bed movements	**6.1.2 (III)** 9)Weather related and outside force: i.Weather related ii.Lightening iii.Hydro technical: water-related threats including, but not limited to, liquefactions, flooding, channeling, scouring, erosions, floatation, breaches, surges, inundations, tsunamis, ice jams, frost heaves, and avalanches, creek area effects, river meandering, river bed / bank movement iv.Geotechnical: earth movement threats including, but not limited to, subsidence, extreme surface loads, seismicity, earthquakes, fault movements, mining, and mud and landslides, muddy land effects v.High wind

37	SCHEDULE-6	6.1.3 Consequence and Impact Analysis: Once the hazardous events are identified, the next step in the risk analysis is to analyse their consequences, that is, estimate the magnitude of damage to the public, property and environment of all the identified threats. These consequence may include leak, fire, explosion, gas cloud etc. Consequence estimation can be accomplished by using mathematical models e.g. consequence modelling. Identification of High-consequence area (HCA): Locations along the pipeline system meeting the criteria for High-Consequence Areas are identified. Generally, these are high-population-density areas, difficult-to-evacuate facilities (such as hospitals or schools), and locations where people congregate (such as places of worship, office buildings, or fields). Clause no. 3.2 of ASME B 31.8 S may be referred for detailed information regarding potential impact area.	6.1.3 Consequence and Impact Analysis: Once the hazardous events are identified, the next step in the risk analysis is to analyse their consequences, that is, estimate the magnitude of damage to the public, property and environment of all the identified threats. These consequence may include leak, fire, explosion, gas cloud etc. Potential Impact Area: Generally, these are high-population-density areas, difficult-to-evacuate facilities (such as hospitals or schools), and locations where people congregate (such as places of worship, office buildings, or fields).
38	SCHEDULE-6	6.1.4.1 Developing a Risk Assessment Model:	6.1.4.1 Developing a Risk Assessment Approach:
39	SCHEDULE-6	6.1.4.2 Risk Assessment for the pipeline system: The risk assessment is continuous and repetitive process. System wide risk assessment shall be carried out at least every year by pipeline operators	6.1.4.2 Risk Assessment for the pipeline system: The risk assessment is continuous and repetitive process. System wide risk assessment shall be carried out every year by pipeline operators .....
40	SCHEDULE-6	6.1.5 Integrity Assessment: A plan shall be developed to address the most significant threats and risks as per previous section and determine appropriate integrity assessment methods to assess the integrity of the pipeline segment. The following methods can be used for Integrity Assessment: ▪Hydro testing before commissioning at test pressure as per T4S standard ▪ Inline inspection (ILI) ▪ External & Internal Corrosion Direct Assessment(ECDA/ICDA) ▪Various forms of pipeline surveillance and monitoring e.g. patrolling Integrated Surveillance System (ISS) etc	6.1.5 Integrity Assessment: A plan shall be developed to address the most significant threats and risks as per previous section and determine appropriate integrity assessment methods to assess the integrity of the pipeline segment. The following methods can be used for Integrity Assessment: ▪Pressure testing ▪ Inline inspection (ILI) ▪ Direct Assessment (ECDA, ICDA & SCCDA) ▪ Any other Integrity Assessment methodology
41	SCHEDULE-6	6.1.5 Integrity Assessment: *Para starting with* The operator of a pipeline system shall develop a chart of most suited integrity assessment method and assessment interval for each threat and risk. The operator shall	6.1.5 Integrity Assessment: *Para starting with* The operator of a pipeline system shall develop a chart of most suited integrity assessment method and assessment interval, prevention and mitigation measures for each threat and risk. The operator shall .....
42	SCHEDULE-6	6.1.6 Mitigation and Response (Repair and Prevention) After the completion of assessment like inline inspection, and coating health surveys etc., the results shall be evaluated and the necessary repairs and preventive actions shall be undertaken to eliminate the threat to pipeline integrity.	6.1.6 Mitigation and Response (Repair and Prevention) After the completion of Integrity assessment like inline inspection, coating health surveys etc., the results shall be evaluated and the necessary repairs and preventive actions shall be undertaken to eliminate the threat to pipeline integrity.
43	SCHEDULE-6	6.1.6 (A) (a) iii) Metal loss indication affecting a detected longitudinal seam, if that seam was formed by direct current or low frequency electric resistance welding or by electric flash welding.	6.1.6 (A) (a) iii) Metal loss indication affecting longitudinal seam, if that seam was formed by direct current or low frequency electric resistance welding or by electric flash welding.

44	SCHEDULE-6	**5.8 Review of existing pipeline Class Locations:** If class location changes are perceived due to demographic changes along the existing pipelines, population density survey may be carried out to ascertain the changes in class location. To address the changes in class location of a pipeline from lower to higher class, the provisions mentioned in Technical Standards and Specifications including Safety Standards /ASME B31.8 shall be considered. The one or multiple following mitigation measures may also be considered till same is mitigated as per Technical Standards and Specifications including Safety Standards /ASME B 31.8 requirements -	**6.1.6 (C) Review of existing pipeline Class Locations:** If class location changes are perceived due to demographic changes along the existing pipelines, population density survey may be carried out to ascertain the changes in class location. The change in Location Class shall be evaluated in accordance with relevant provisions of ASME B31.8 and where action is indicated on account of such change, risk assessment of the impacted pipeline section shall be carried out considering the increase in population density and appropriate mitigation actions shall be taken if required. The mitigation actions should include as many of the following but as a minimum shall include those indicated in the table given underneath the list of actions:
45		**5.8 Review of existing pipeline Class Locations: (continued)** a) Section to be declared as vulnerable and frequency of patrolling to be increased as per new class location. b) Intelligent pigging/ Direct Assessment frequencies to be increased. c) CP monitoring frequencies to be increased including provision of continuous data/PSP logging at the location. d) Corrosion monitoring probes to be installed to monitor the corrosion rate. e) Provision of carbon fiber wrapping/ composite sleeves/ concrete slabs.	**6.1.6 (C) Continued** (a) The concerned pipeline section shall be declared as vulnerable and frequency of patrolling to be increased as per new Location Class. (b) Awareness program among local populace. (c) Warning Markers shall be installed at lesser interval of distances (minimum every 100 m) (d) Pipeline cover survey and Mitigation (min every 5 years) (e) CP monitoring and surveys shall be carried out more rigorously (PSP Off survey – every 6 months) (f) Frequency of Integrity Assessment shall be increased to a minimum of once in 7 (seven) years or as indicated by risk assessment whichever is more frequent. (g) Engineering Critical Assessment of the impacted section and mitigation of identified vulnerabilities. (h) Pipeline barrier protection shall be provided by installing concrete slabs / concrete coating / composite wraps / sleeves etc.
46			**6.1.6 (c) continued** **Minimum Required Action after Risk Assessment** Changes from lower to higher location class 2: (a) to (d) Changes from lower to higher location class 3: (a) to (g) Changes from lower to higher location class 4: (a) to (h) In addition to above, any other actions indicated by risk assessment shall be taken.
47	SCHEDULE-6	6.2 Performance Evaluation Plan: Every pipeline operator shall define suitable performance indicators which can be monitored to give a picture of the integrity levels of various aspects of the operator's pipeline assets. Refer ASME B 31.8S table no 8 and 9 for finalizing performance measures and performance matrix respectively. Monitoring of these indicators on a periodic basis	6.2 Performance Evaluation Plan: Every pipeline operator shall define suitable performance indicators which can be monitored to give a picture of the integrity levels of various aspects of the operator's pipeline assets. Monitoring of these indicators on a periodic basis .....
48	SCHEDULE-6	6.3.1 External Communication: ..... (II) General Public near pipeline route	6.3.1 External Communication: ..... (II) General Public / Public institutions like schools, hospitals etc. near pipeline route
49	SCHEDULE-6	6.5 Quality Control All the entities shall prepare and maintain documented procedure and records as per the requirement of this standard which can also be made part of existing Quality programme (e.g. ISO-9001-2001) maintained by the entities. The following activities shall be made part of quality control programme:	6.5 Quality Plan All the entities shall prepare and maintain documented procedure and records as per the requirement of this standard which can also be made part of existing Quality Management programme (e.g. ISO-9001) maintained by the entities. The following activities shall be made part of quality control programme:

50	SCHEDULE-6	**Clause 6.5** *Text start* Internal Audits of the Pipeline Integrity .... Prevention, mitigation and repair criteria have been established, met and documented. *Text End*	Moved and modified at Section 9.2
51	SCHEDULE-7	7.1 MANAGEMENT APPROVAL: • Step#1: Prepared by In-house team or Consultant • Step#2: Checked by In-house team Head or Consultant head • Step#3: Provisionally approved by Head of Operation team of the entity • Step#4: Conformity of IMS document with the Regulation by Third Party Inspection Agency (TPIA)	7.1 MANAGEMENT APPROVAL: • Step#1: Prepared by In-house team or Consultant • Step#2: Checked by In-house team Head or Consultant head • Step#3: Provisionally approved by Head of Operation / Maintenance of the entity • Step#4: Verification of conformity of IMS document with the Regulation by Third Party Inspection Agency (TPIA)
52	SCHEDULE-7	7.2 ACCEPTANCE BY PETROLEUM AND NATURAL GAS REGULATORY BOARD (PNGRB) • Step#5: Acceptance by the Board	Deleted
53	SCHEDULE-7	7.3 APPROVAL FOR IMPLEMENTATION • Step#6: Approval of Integrity Management System document for implementation by the Board for the first time and approval of subsequent periodic review by CEO or Full-time Director of the entity.	• Step#5: Approval of Integrity Management System document for implementation by the Board of the entity for the first time and approval of subsequent periodic review by CEO or Full-time Director of the entity.
54	SCHEDULE-7	Note: A certificate regarding the approval of Integrity Management System document duly approved as specified at clause no. 7.1 above shall be submitted to the Board that the Pipeline Integrity Management system is in line with the requirements of the various regulations issued by the Board from time to time and has been approved by the CEO or full time Director of the company.	• Step#6: Approved IMS document along with confirmation from entity of its implementation shall be submitted to the Board.
55	SCHEDULE-8	Conformity of Integrity Management System document with regulation by Third Party Inspection Agency. 3 months from the approval by Head of Operation team of the entity.	Conformity of Integrity Management System document with regulation by Third Party Inspection Agency. 3 months from the approval by Head of Operation / Maintenance of the entity.
56	SCHEDULE-8	4 Submission of Integrity Management System document to Petroleum and Natural Gas Regulatory Board 1 month from the conformity of Integrity Management System by Third Party Inspection Agency	Deleted
57	SCHEDULE-8	5 Approval for implementation by the entity Within 3 months from the acceptance of Integrity Management System document by Petroleum and Natural Gas Regulatory Board	4 Approval for implementation by the Board of the entity for the first time and approval of subsequent periodic review by CEO or Full-time Director of the entity Within 3 months from the conformity assessment by Third Party Inspection Agency (TPIA)
58	SCHEDULE-8	6 Start of Implementation Immediately after approval at Sr. No. 5 above	5 Start of Implementation Immediately after approval at Sr. No. 4 above
59	SCHEDULE-8		6 Submission of Integrity Management System document to Petroleum and Natural Gas Regulatory Board 1 month from the approval as mentioned at Sr. No. 4 above

60	SCHEDULE-8	7 Submission of Compliance Statement to Petroleum and Natural Gas Regulatory Board Shall be submitted within 1 year to Petroleum and Natural Gas Regulatory Board	7 Submission of Compliance Statement to Petroleum and Natural Gas Regulatory Board Shall be submitted every year to Petroleum and Natural Gas Regulatory Board
61	SCHEDULE-8	Note: Steps for implementation to be followed as described in Schedule-7	Note: Steps for implementation to be followed as described in Schedule-7 For new pipelines, the above shall be complied within one year of date of commissioning
62	SCHEDULE-9	**REVIEW OF THE INTEGRITY MANAGEMENT SYSTEM** **9.1 Periodicity of review of Integrity Management System** Entities shall review their existing Integrity Management System every 3 years based upon the: (i) Revised Baseline data (ii) Critical Inputs from various departments	**REVIEW OF THE INTEGRITY MANAGEMENT SYSTEM** **9.1 Periodicity of review of Integrity Management System** Entities may review their existing Integrity Management System from time to time but not exceeding an interval of every 3 years and update the same if required in accordance with the provisions of Schedule 7 based on the performance of Integrity Management Program and /or changes if any in the statutory / regulatory requirements. However, changes of dynamic nature such as addition, deletion, modification of assets, key personnel, interfaces with other utilities etc. may not require revision in the IMS and the same can be kept updated periodically by the concern entity
63	SCHEDULE-9	**From clause 6.5** Internal Audits of the Pipeline Integrity Management System shall be performed on a regular basis. The purpose of the audits is to ensure compliance with the policies and procedures as outlined in these regulations. Recommendations and corrective actions taken shall be documented and incorporated into the Pipeline Integrity Management System. Internal audits are conducted by the audit group nominated by Head of the Operations Team of the entity at least once in a year. Internal audits aim to ensure that the Integrity Management System's framework is being followed. The following essential items will be focused for any internal and external audit of the entire Integrity Management System: • Ensure that the Baseline Plan is being updated and followed and that the baseline inspections are carried out. • Verify qualifications of O&M personnel and contractors based on education qualification (Appendix-IV), formal training received through in-house or external programme, demonstrated practical skills, and experience records in the relevant areas. Refer ASME B31Q for guidance. • Ensure adequate documentation is available to support decisions made. • Determine if annual performance measures have been achieved. • A written integrity management policy and programme for all elements. • Written Integrity Management System procedures and task descriptions are up to date and readily available. • Activities are performed in accordance with the Integrity Management System. • A responsible individual has been assigned for each task. • All required activities are documented. • All action items or non-conformances are closed in a timely manner. • The risk criteria used have been reviewed and documented. • Prevention, mitigation and repair criteria have been established, met and documented.	**9.2 Integrity Management System Audit** Audit of the Pipeline Integrity Management System shall be performed on a regular basis. The purpose of the audits is to ensure compliance with the policies and procedures as outlined in these regulations. Recommendations and corrective actions taken shall be documented and incorporated into the Pipeline Integrity Management System. The following essential items will be focused for any internal and external audit of the entire Integrity Management System: • IMS document is developed, approved and is valid. • Activities are performed in accordance with the Integrity Management System. • Verify if annual performance measures have been evaluated • All action items or non-conformances are closed in a timely manner. • The risk criteria used have been reviewed and documented. • Prevention, mitigation and repair criteria have been established, met and documented.

64	SCHEDULE-9	9.2 Review of Internal and External Audit There shall be a system for ensuring compliance to the provisions of these regulations by conducting following audits during operation phase: (a) Internal Audit as per the checklist for natural gas pipelines provided by Petroleum and Natural Gas Regulatory Board shall be carried out by the management of operator every year. (b) External Audit (EA) by third party, approved by the Board, as per the methodology specified by the Petroleum and Natural Gas Regulatory Board every 3 years.	9.3 Frequency of Internal and External Audit There shall be a system for ensuring compliance to the provisions of these regulations by conducting following audits during operation phase: (a) Internal Audit - Every year. (b) External Audit - Every 3 years in-line with the approved IMS by third party empaneled by the Board
65	SCHEDULE-10	Entity will have to address the requirement of manpower for different stages of project, namely: Design, construction, commissioning, operation and maintenance. The entity which is preparing Integrity Management System should address the manpower requirement for its present and future operations. The qualification of such manpower shall conform to Appendix-IV.	Entity shall have a written plan / philosophy of manning the installations based on activities required for compliance to this regulation. Entity shall address the requirement of manpower for different stages of project, namely: Design, construction, commissioning, operation and maintenance in the above plan.
66	Appendix-II	GIS Mapping Implementation 2 years	GIS Mapping Implementation 2 years from the commissioning of pipeline
67	Appendix-III	SUGGESTIVE CHART FOR SELECTION OF INTEGRITY ASSESSMENT METHOD* WITH RESPECT TO SPECIFIC THREAT	SUGGESTIVE CHART FOR SELECTION OF INTEGRITY ASSESSMENT / MANAGEMENT METHODS* WITH RESPECT TO SPECIFIC THREAT
68	Appendix-III	**Column Heading** Threat Group Threat Integrity Assessment Method* Assessment interval	**Column Heading** Threat Group Threat Integrity Assessment / Management Method* Interval
69	Appendix-III	**External Corrosion** Inline inspection, External Corrosion Direct Assessment	**External Corrosion** Inline inspection / External Corrosion Direct Assessment (ECDA)/ Pressure Testing / Any other Integrity Assessment Methodology
70	Appendix-III	**Internal Corrosion** Inline inspection, Internal Corrosion Direct Assessment	**Internal Corrosion** Inline inspection / Internal Corrosion Direct Assessment (ICDA) / Pressure Testing / Any other Integrity Assessment Methodology
71	Appendix-III	**Stress Corrosion Cracking** Inline inspection, Stress Corrosion Cracking Direct Assessment	**Stress Corrosion Cracking** Inline inspection / Stress Corrosion Cracking Direct Assessment (SCCDA) / Pressure Testing / Any other Integrity Assessment Methodology
72	Appendix-III	**(B) Stable** **Defective Pipe Seam, Pipe, Girth Weld, fabrication Weld** Hydro-test (Post Construction), Inline inspection	**Defective Pipe Seam, Pipe, Girth Weld, fabrication Weld** Inline inspection / Pressure Testing / Any other Integrity Assessment Methodology
73	Appendix-III	**(C)Time-Independent** **Lightning** Surge diverters	**Lightning** Inspection of Surge diverters
74	Appendix-III	**Heavy rains or floods** Anti-buoyancy Inspection, Surveillance	**Heavy rains or floods** Inspection, Surveillance
75	Appendix-III	**Creek Area Effects** Surveillance, Pipe to Soil Potential surveys near creek, Leakage survey, Anti-Buoyancy Inspection, Integrated Surveillance System	**Creek Area Effects** Surveillance, Leakage survey, Inspection
76	Appendix-III	**Muddy/Marshy area effects** Surveillance, Pipe to Soil Potential surveys, Leakage survey, Cathodic Protection monitoring, Integrated Surveillance System	**Muddy/Marshy area effects** Surveillance, Leakage survey, Cathodic Protection monitoring

77	Appendix-III	**River Bed Movements** Surveillance, Pipe to Soil Potential surveys, Leakage survey, Cathodic Protection monitoring, Anti-Buoyancy Inspection, Integrated Surveillance System	**River Bed Movements** Surveillance, Leakage survey, Inspection
78	Appendix-III	* Some of the important Integrity Assessment Methods have been briefed in Schedule-5 of these regulations	* Some of the important Integrity Assessment/ Management Methods have been mentioned in Schedule-5 of these regulations.
79	Appendix-IV	Minimum Qualification and Experience for Field Personnel in Project Phase as well as O&M Stage	Appendix - IV Deleted