Preamble

Terms & Definitions

Context

Leadership

Planning

Support

Operation

Performance Evaluation

Improvement

• • •

Reference Standards
ISO14001:2015 &
ISO45001:2016
Clause 10.1: Opportunities For Continual Improvement; Nonconformity and Corrective Action.
Clause 10.2: Continual Improvement.
Clause 8.2: Management of Change.
OHSAS18001:2007
Clause 4.5.3.2: Nonconformity, Corrective and Preventive Action.

This Section's Objectives

- Take action to improve HSE System and achieve intended outcomes.
- Investigate an incident for its root cause determination to avoid recurrence.
- Control nonconformities and take appropriate corrective & preventive actions.
- Enhance the suitability, adequacy, and effectiveness of HSE System.

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Associated Documents

- Preliminary Incident Report
- CPR Form
- CPR Log / Register
- Register of Occupational Illnesses and Injuries
- Employee's Workplace Exposure & Health (WEH) Record
- Engineering Change Request (ECR)

Applicable Documents

-- Nil --

Opportunities For Continual Improvement
OGM/P-HSE-9.1

Management of Change
OGM/P-HSE-9.2

Incident Investigation
OGM/P-HSE-9.3

9.1 Opportunities For Continual Improvement

OGM/P-HSE-9.1(07) Revision Number 7

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Change/ Revision Log

#	Description of Change
1	Incident Investigation portion has been separated from this procedure.

Associated Documents Approval & Issue

Related Document/ Record	Initiated by	Reviewed by	Checked/ Verified / Approved by
OGF – HSE – 047 CPR	Any Employee	Location HSE Rep.	Location IC
OGF – HSE – 048 CPR Log	Location HSE Rep.	Location HSE IC	Location IC/ Location HSE IC

1.0 Mechanism for Identifying Opportunities For Continual Improvement

- Workforce members at all levels shall be encouraged to identify opportunities for continual improvements to improve the reliability of operations, processes, services with respect to HSE management system.
- Following activities shall provide mechanism for identifying opportunities for continual improvement, but not limited to:
  a) Observation visits / walkthroughs / STOP Card Logs
     (unsafe conditions and unsafe behaviors)
  b) Performance trends against the objectives and targets
  c) Identification of a system deviation or failure that may result in non-fulfillment of HSE related contractual, legal or regulatory requirement
  d) HSE audit findings
  e) HSE performance reports (KPIs analysis)
  f) Inspection and test records
     (esp. when performance of personal protective, safety critical and emergency equipment falls below desirable level)
  g) Repetitive operational failures or near hits of similar nature that have tendency to cause incident
  h) HSE related complaints / feedback from customers
  i) HSE MRC meetings

2.0 Corrective and Preventive Actions

- Corrective and preventive actions shall be taken to eliminate the causes of non-conformities to prevent their recurrence and to eliminate any potential causes of non-conformity using CPR template as follows:
  - Location HSE IC shall review and classify the reported-issue, sort out Primary Surface Cause and discusses the nature of problem and corrective & preventive action with the concerned Sectional IC
  - HSE Section shall enter CPR description into CPR Log
  - Concerned Sectional IC shall determine the Contributing Surface Cause(s) and Design Root Cause after thorough investigation in consultation with all the stakeholders
  - HSEQ Section in consultation with the relevant ICs shall formulate the Problem Solving Team and get endorsement by Location IC
  - HSEQ Section shall forward copies of CPR to Problem Solving Team due to whom the issue has fundamentally arisen or who are responsible to rectify
  - Problem Solving Team shall:
    - Propose actions in the presence of HSEQ Rep.
    - Agree on the decision regarding the final action(s) to be taken, fully endorsed by Location IC
    - Allocate Completion-Time to correct / prevent the issue (to be concurred in the presence of Location IC),
    - Take appropriate action(s), and
    - Timely intimate HSE Section of the actions taken.

    Note: Concerned IC could also be the part of Problem Solving Team.
  - When a corrective and preventive action is decided upon, it may be implemented on trial basis and the results shall be closely monitored. Further measures or changes shall be made where required during the trial period until satisfactory results are attained.
  - The corrective and preventive measures where deem fit shall be made by incorporating changes in the HSE system in the relevant documents such as drawings, specifications, operating procedures, work instructions and / or templates.
  - Where the corrective and preventive action identifies new or changed hazards or need for new or changed controls, the proposed actions shall be implemented ensuring that the risk(s) reassessed accordingly.
  - On, or immediately after, the due date of implementation of a corrective

and preventive action, HSE Rep. shall follow up to determine if the corrective and preventive action has been implemented and whether it is effective.

- When there is objective evidence that the corrective and preventive action is effective, CPR shall be closed out. If more work is needed to fully implement the action, a new follow up date shall be agreed upon.
- HSE Section shall enter the final status of the CPR into the CPR Log and maintain the original CPR form as record.

9.2 Management of Change (MoC)

OGM/P-HSE-9.2(6A) Revision Number 6(A)

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Change/ Revision Log

#	Description of Change
1	Scope of MoC has been elaborated; Modus Operandi has been defined in generic terms applicable to all Locations.
2	Added: Engineering Change Request process, flowchart and a new template introduced.
3	Added: A scenario matrix on how approval of MoC shall be taken from the concerned competent authorities.
4	Added: New scenario "change to be affecting risk rating" has been added in the above scenario matrix.
5	Added: Risk register to be reviewed/ revised after processing ECR.

Associated Documents Approval & Issue

Related Document/ Record	Initiated by	Reviewed by	Checked/ Verified / Approved by
OGF – HSE – 051 Engineering Control Request	Any Employee	Location IC, Sectional IC, Location HSE Rep.	Respective HOD, Area Manager, Location IC

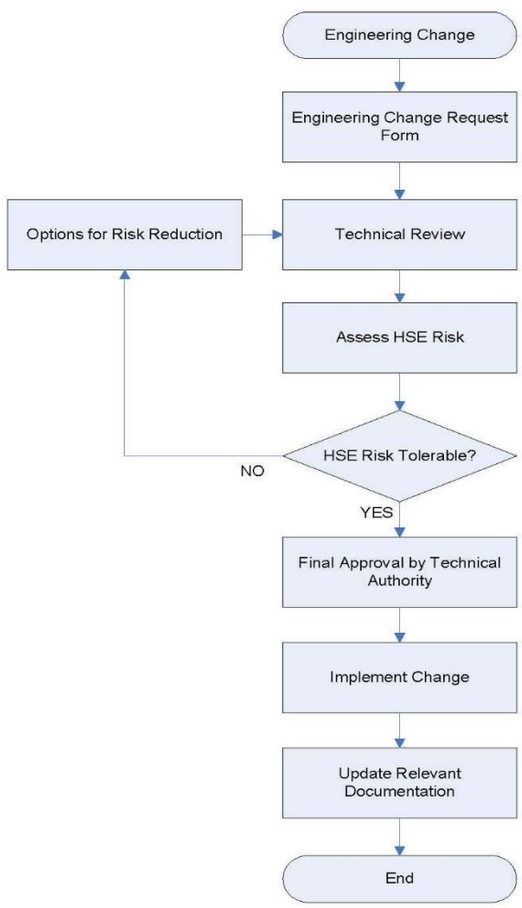
9.2.1 Scope of Management of Change (MoC)

- Management of Change, or MoC, is a practice used to ensure that safety, health and environmental risks are controlled when a company makes changes in their facilities and operations; When decisions and changes are made rapidly, safety and health risks can increase resulting in disasters such as deflagrations and/or explosions.
- A MoC shall be used to ensure that all changes to operating processes are properly reviewed and any hazards introduced by the change are identified, analyzed, and controlled before start-up and/or before resuming the production process.
- Engineering Change are any modifications that differ from the current facilities design basis. It applies to facilities in operation and in the development phase. This procedure mandates that OGDCL management shall control the change regarding any modification whether temporary or permanent, to plant and equipment, process materials, operating procedure, operating conditions which is outside the normal methods of operation and maintenance. Few examples of modifications are as follows:
  - Any change in the approved method of operation (as defined in the standard operating procedures).
  - A repair to or replacement of an existing item of equipment or component which represents a departure from the existing engineering specification.
  - A change in the means of support of plant items, pipe-work or fittings or a change to a structure, which could affect its load bearing capabilities.
  - A change, irrespective of its magnitude, that affects the engineering line diagram.
  - A change in the material of construction, size or shape of any component which is in contact with process fluid or utility stream or which could affect the flow rate, temperature, pressure or composition of a process fluid or utility stream.
  - A change to the setting of an alarm or trip.
  - A change to the setting or capacity of a relief stream or device.
  - A change to a control system including the overriding of control action in the field by forcing actuated valves to a particular position.
  - A change to any hardware or software trip or interlock system, including controllers / indicators, etc. This includes any override or defeat of a trip or interlock system unless the override/defeat is an integral part of the system design e.g. a key override or purpose-designed faceplate for software overrides/defeats.
  - Introduction of any new substance into any part of the process or plant equipment including any change in formulation, change in ratio of ingredients or change in source of supply.
  - An alteration to the flow-rate, temperature, pressure or composition of a process fluid or utility stream outside the defined operating parameters.
  - Any change or alteration in layout of an operating field building or building services.
  - Any change in approved project /design specification during field implementation
  - Any change in Operating, maintenance, inspection and testing procedures
  - Change in duty or operation from original design intent even though physical changes are not required, e.g. load increase
  - Temporary installation of contracted / hired equipment which impacts on the process or any safety critical element
  - Temporary changes for a limited time e.g. box-up of leak, plant performance test outside original design envelope
  - Replacement manufactured equipment or spare parts supplied with a different specification from the design basis

- New fabricated or manufactured equipment which are to be installed on the facilities
- Any pressure containing or load bearing piping, structure and pressure vessels, which are to be drilled, cut, subject to fusion joining processes or will have properties changed
- Computer software changes to start-up sequences, control logic, trip settings or shutdown sequences (including new software or replacement with updated versions)
- Hard wired or printed circuit board changes to start-up sequences, control logic, trip settings or shutdown sequences
- Mechanical, pneumatic or hydraulic system changes to start-up sequences, control logic, trip settings or shutdown sequences
- Alterations in routing or protective shielding to electrical and instrument cables, and instrument impulse and control lines
- Changes to electrical: area classification, distribution, protective and back-up systems
- Changes to electrical bonding and earthing arrangements
- Changes to telecommunication, navigation and radar systems
- Change to active fire protection systems
- Alterations to fire walls, blast walls, protective coatings, insulation or heat trace systems
- Changes that impact on dispersal of substances to air, land or water courses
- Changes to hazardous drain systems
- Change in location of safety and lifesaving appliances
- Changes to temporary refuge, evacuation, escape, recovery and rescue systems
- Introduction of new materials or chemicals
- Third party (external) changes which could cause an increase in risk e.g. another operating facility or new housing/roads being built adjacent to the existing facility

Whereas the following type of activities shall "not" constitute modification:

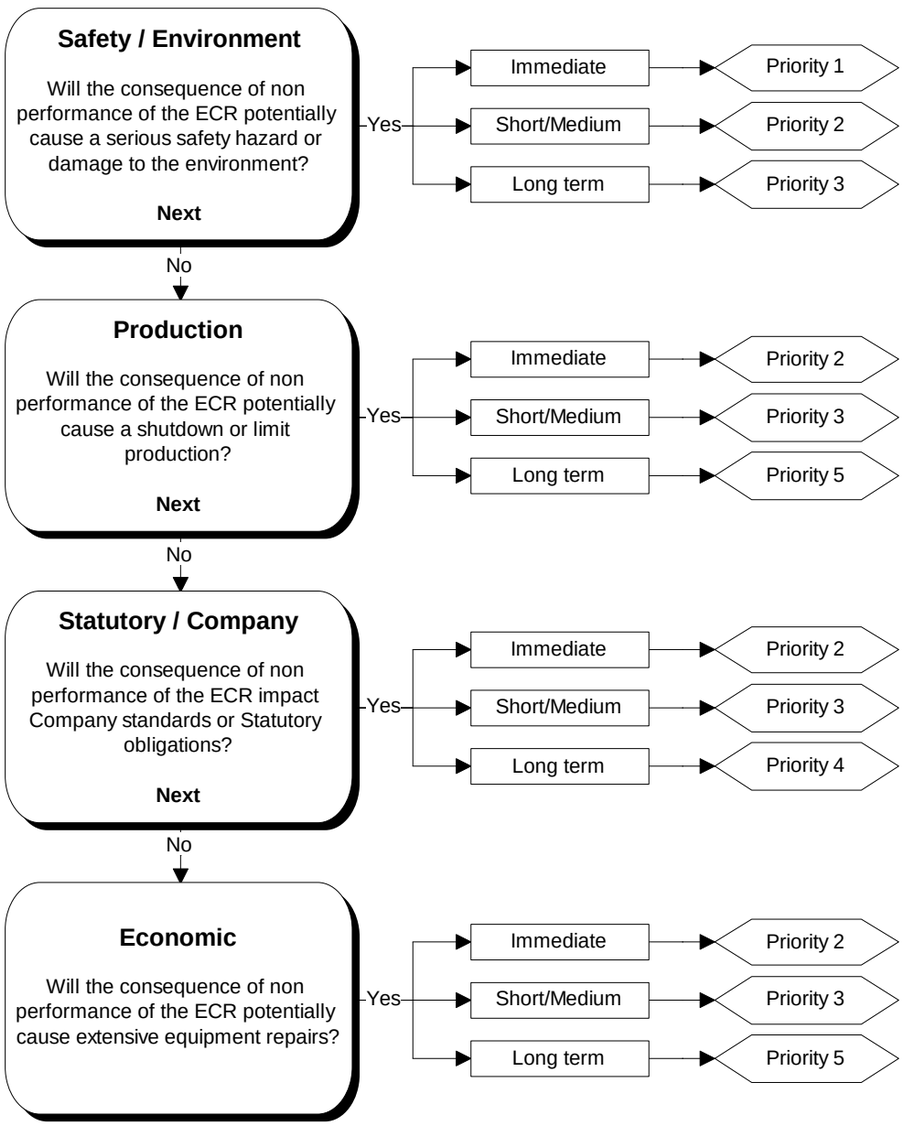
- Replacement of similar kind of piping, mechanical parts, instruments or electrical components that are identical to the existing ones.
- Change in operating parameters within safe operating limits as specified in the design conditions or the operating manuals.
- Routine repairs and services carried out by maintenance or other groups.
- Modifications that are adequately covered by existing control procedures or do not affect the integrity of the facilities are excluded from the scope of this standard. Typically, these would be as follows: -
  - Changes to domestic and office equipment, and consumables
  - Temporary isolations for servicing, examination and testing of equipment within the planned maintenance program
  - Routine servicing for lube oil, filters, etc.



- Like for like replacements, e.g. gas detector, floor grating, loose lifting gear
- Temporary changes covered by permit to work or standing order procedures.

9.2.2 Engineering Change Request

- All Engineering Change Request shall be raised via **Engineering Change Request Form**. Engineering Change Request can be raised by any OGDCL employee when any change as per above section is required.
- An ECR Committee shall be formulated at each location comprising minimum of Location IC, Sectional ICs and Location HSE Representative. The committee shall conduct Monthly ECR Review to review change proposals and minutes of meetings shall be documented. The meeting shall:
  - Review all Engineering Change Requests (ECR) and give a priority status (1-5) in accordance with flowchart provided below:



Immediate	=	Within one month
Short / medium	=	One - six months
Long term	=	>six months

- Assign technical authority (role) for each ECR for further assessment. Technical authority (role) shall be an employee (Location or Head office) who is deemed competent to analyze and conduct Hazard / Risk Analysis of Engineering Change Request.
- Review ECR priorities where questions exist
- Review all other ECR priorities in view of the current status and backlog.

- Review overall ECR progress and agree measures to address any resultant issues.
- Recommend ECR's for cancellation shall be identified in the meeting minutes and the originator shall be advised. The reason for cancellation will be documented.

Note:- In special circumstances an ECR may need to be progressed very rapidly. In this instance, Location IC shall convene Emergency ECR meeting.

- The assigned person(s) shall technically review the ECR and shall:
  - Comment upon the requirement for the change
  - Evaluate hazards associated with the change (e.g. increased noise levels)
  - Assess risks (safety, environmental, business)
  - Assess maintenance and operational requirements
  - Consider whether a better solution should be implemented
  - Estimate the pre-implementation costs i.e. design costs
  - Estimate the total ECR costs i.e. Design, Materials, Installation (±25%)
  - Conduct and document Risk Assessment for the planned change and provide any steps /action necessary before proceeding with the Job.
- Approval of Modification Job (change) shall be taken from the concerned competent authority(ies) based on various scenarios as given below:

MoC Scenarios	Executive Director	General Manager	Area Manager	Location IC	Sectional IC
Change to be affecting operations	Complete shutdown of operations, affecting production	Partial shutdown of operations, affecting production	Complete shutdown of sub-unit, not affecting production	Partial shutdown of sub-unit, not affecting production	No shutdown
Change which would require regulatory/ 3rd party approvals or intimation	approved project/ design is affected	new sub-unit is required	safety critical equipment is affected	permissible / allowance operating limits are violated	N/a
Costing	As per delegation of financial powers				
Change to be made after an emergency	Catastrophic (5)	Critical (4)	Major (3)	Marginal (2)	Negligible (1)
Change to be affecting risk rating(afterwards)	Low/ Medium to High		Low to Medium		No effect

- The ECR shall be considered as complete based on following:
  - All work detailed in ECR is completed
  - Satisfactory commissioning and testing has been conducted
  - Personnel have been trained
  - Completion of all as building, revision and updating of all affected drawings, manuals and procedures
  - Issue to field of all affected drawings, manuals and procedures
  - Development and approval of any new procedures required as a consequence of the engineering change
  - Confirmation of receipt from site that all affected drawings, manuals and procedures have been received and filed (copies of transmittals showing field acknowledgement to be placed in ECR file); Filing into ECR file copies of all affected drawings, manuals and procedures
  - Purchase of spare parts
  - Close out of all statutory requirements
  - ECR form is completed and signed off.

9.2.3 Mandatory Requirement For MoC

- Persons involved in Technical review should be experienced in the area that is being assessed
- The cost of change will not necessarily be proportional to the risk impact. In all cases an HSE risk screen shall be used to determine the resources required

to fully evaluate the impact of the change. Ranking of changes using financial criteria shall not be done

- The cumulative effects of change shall be considered. For example a small change, when looked at in isolation, may be rated a relatively low and insignificant risk. However, when combined with other changes the overall risk profile may be intolerable
- HSE Department/ Section shall be consulted to ensure adequate assessment of the HSE risks
- Resources shall be made available to ensure the change is implemented as planned
- Where new skills, technology or greater responsibilities are required, then training and development programs shall be included for persons who may be impacted by the change
- Communication of change during all phases of the change from inception through to completion is obligatory. Special emphasis shall be placed on using feedback during the communication process in order that the persons impacted by the change have the opportunity to suggest improved methods of implementing the change. This will have the benefit of encouraging ownership of the change, overcome inherent resistance to change, and increasing the probability that the change will be successfully implemented
- Close out of completed changes shall always include a full update of the relevant documentation in hard copy and electronic format, as appropriate.

- All changes are properly documented, however with engineering changes there are specific types of documents that should be controlled and subject to revision and formal approval. These include but are not limited to:
  - Risk register
  - Operating, maintenance, inspection, test procedures and work instructions
  - Emergency response procedures/notices
  - Layouts, process flow diagrams, P&IDs, isometrics and utility line diagrams
  - Instrument loop diagrams, cause and effect diagrams, piping isometrics
  - Safety and lifesaving appliance location diagrams
  - QA / QC plans

9.3 Incident Investigation

OGM/P-HSE-9.3(00) Revision Number 00

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THIS REVISION : --

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Change/ Revision Log

#	Description of Change
1	Incident Investigation portion of the Procedure has been separated from the Opportunities For Improvement Procedure # OGM/P-HSE-9.1(06) and new Procedure has been put in place.
2	For assigning jurisdiction to the activity related to the incident, three categories i.e. Controlled Activity, Monitored Activity and Uncontrolled Activity have been included.
3	Active failures i.e. Primary Surface Causes has been included as Actions and Conditions.
4	Pre-Conditions i.e. Contributory Causes has been included as Personal Factors and Job Factors.
5	A standardized Incident Investigation Report (IIR) format has been made part of this procedure.

Associated Documents Approval & Issue

Related Document/ Record	Initiated by	Reviewed by	Checked/ Verified / Approved by
OGF – HSE – 046 Preliminary Incident Report (PIR)	Any Employee	Location IC Location HSE Rep.	Location IC
OGF – HSE – 046A Incident Investigation Report (IIR)	Investigation Committee	Investigation Committee	Investigation Committee
OGF – HSE – 049 Register of Occupational Illnesses and Injuries	Location Medical Rep.	Location Medical Rep.	Location Medical Rep.
OGF – HSE – 050 Employee's Workplace Exposure & Health (WEH) Record	Location Medical Rep.	Location Medical Rep.	Location Medical Rep.

1.0 Incident Reporting

- First-hand information of an incident shall be transmitted by Location IC to all concerned at Head Office within 01 hour of the incident through available communication channels like telephonically, cellular messaging, email, etc.
- Location IC shall submit **Preliminary Incident Report (PIR)** on the prescribed format to HSEQ Department and concerned HOD at Head Office on immediate basis but not later than 12 hours.
- Location IC shall assign jurisdiction of the activity in the **Preliminary Incident Report (PIR)** as follows:

Controlled Activities: This is an activity in a work environment (as a condition of employment i.e. physical location, equipment, material or vehicle) related to OGDCL workforce member where OGDCL can set HSE policies, standards and procedures (PSP) and directly supervise and enforce its application. Incidents arising from controlled activities are reported, investigated, tracked and included in OGDCL HSE performance measures. *Examples of controlled activities include:*

- OGDCL's workforce member performing job or driving company-owned vehicle within or outside OGDCL site boundaries
- Diseases to OGDCL's workforce member that may be caused by inhalation, absorption, ingestion or direct contact with workplace hazard
- OGDCL's workforce member becoming ill by ingesting food contaminated by workplace contaminants (such as lead), or gets food poisoning from food supplied by the company
- OGDCL hired bowsers / carriage services under contractual obligation within OGDCL site boundaries impacting OGDCL workforce member and / or asset
- Service company, contractor or sub-contractor crew performing job or driving vehicles as per contractual obligation within OGDCL site boundaries impacting OGDCL workforce member and / or asset
- OGDCL workforce member traveling to or from his fixed or temporary residence to or from his fixed or temporary work place in either company-hired or personal vehicle inside OGDCL site boundaries

Monitored Activities: This is an activity where OGDCL can influence but cannot set HSE policies, standards and procedures (PSP) and cannot directly supervise and enforce its application. Incidents arising from monitored activities are reported, investigated (where possible) and tracked but are not included in OGDCL HSE performance measures. *Examples of monitored activities include:*

- Outsourced / hired company's seismic and drilling crew performing job or driving vehicle within or outside OGDCL Block / Lease
- OGDCL hired bowsers / carriage services under contractual obligation outside OGDCL site boundaries
- Service company, contractor or sub-contractor crew performing job or driving vehicles as per contractual obligation within OGDCL site boundaries, but not impacting OGDCL workforce member and / or asset
- Outsourced company's gas processing crew performing job or driving vehicle as per contractual obligation
- OGDCL workforce member traveling to or from his fixed or temporary residence to or from his fixed or temporary work place in either company-hired or personal vehicle outside OGDCL site boundaries
- The injury or illness involves signs or symptoms that surface at work but result solely from a non-work-related event or exposure that occurs outside the work environment
- The injury or illness results solely from voluntary participation of OGDCL workforce member in a wellness program or in a medical, fitness, or recreational activity such as blood donation, physical examination, vaccination, organized social event, gym, swimming, jogging, or other sports activities within or outside OGDCL site boundaries
- The injury or illness solely the result of OGDCL workforce member eating, drinking, or preparing food or drink for personal consumption within OGDCL site boundaries
- The injury or illness solely the result of personal grooming, self-medication for a non-work-related condition, or is intentionally self-inflicted by OGDCL workforce member within OGDCL site boundaries
- The illness is the common cold or flu affecting OGDCL workforce member within OGDCL site boundaries

Uncontrolled Activities: If an activity is not controlled or monitored, it is an uncontrolled activity. This is an activity where OGDCL does not set or influence HSE policies, standards and

procedures (PSP) and does not supervise HSE performance. Incidents arising from uncontrolled activities are neither reported, investigated or tracked; although these incidents should be assessed for potential learning that could be applied within OGDCL. *Examples of uncontrolled activities include:*

- Activities in OGDCL's non-operated Joint Venture Partner's field by its own or contractors workforce members
- Service company, contractor or sub-contractor crew performing job or driving vehicles as per contractual obligation outside OGDCL site boundaries

Note-1:
A work related injury or illness incurred to individuals of following categories working / visiting controlled areas and declared medically unfit to attend duty on the next calendar day shall not be considered as OGDCL's lost time:

- *Hired driver*
- *Visitor*
- *Third party auditor*
- *Supplier*
- *Customer*
- *Service companies crew*
- *Contractor crew*
- *Regulator*

Incident caused to above categories shall be reported and investigated keeping in view the level and potential of incident and shall be considered in the HSE Performance only if the root cause is operational control or equipment failure but not due to individual's mistake.

Note-2:
For further clarification, HSEQ Department Head Office may be consulted.

- Location IC shall give severity to the incident in the **Preliminary Incident Report (PIR)** from the table provided in the overleaf of PIR template.

1.2 Classifying and Registering Injuries

- The Location Medical Rep. shall classify the injuries / illnesses *(in case there is some confusion, Field HSE Rep may be consulted)* and note the extent and severity of each case as follows:

First Aid Case: Work related injuries or illnesses that involve a single treatment of minor bruises, cuts, burns, scratches etc. and not requiring medical care of the level to take the patient to the Hospital. This includes injuries / illnesses that require minor treatment, e.g. any one-time treatment, cleansing, application of bandages / band-aids, treatment of minor scratches, cuts, burns, splinters, etc.

Medical Treatment Case (MTC): An injury severe enough to require treatment by a medical practitioner (a physician or nurse), but does not cause the worker to miss any work.

Restricted Workday Case (RWC): A RWC is a work related injury or illness which results in the OGDCL's or contractor's workforce member being unable; (1) to perform one or more routine duties, or (2) to work the full day on, or the next calendar day after the day of injury/illness. A RWC occurs when the injured person is temporarily assigned to do other, less strenuous work (than the normal job) e.g. an injured maintenance technician doing light office work. This also includes situations where the worker does perform his routine duties but for less period of time than normal shift timings because of restriction of work.

Lost Time Injury (LTI): A work related injury or illness which results in the OGDCL's or contractor's workforce member declared medically unfit to attend duty on the next calendar day (24 hrs) after the day of injury. The criteria "24 hours" include rest days, weekend days, scheduled holidays, public holidays or subsequent days after ceasing employment; However, if medical practitioner declares that the injured person is fit to attend office within 24 hours, then the injury shall not be LTI.

Permanent Partial Disability (PPD): Any work related injury or illness which results in complete loss, or permanent loss of use, of any part(s) of the body or any permanent impairment of function or parts of body, regardless of any pre-existing disability of the injured member of impaired body function. A PPD is not related to the ability of the injured person to do is normal work, e.g. it is classified as a PPD if he has lost a finger, toe, arm, limb, etc. but (upon recovery) is still able to do his normal work or any other work that permits for the partial disability.

Permanent Total Disability (PTD): Any work-related injury or illness, which permanently incapacitates an employee from doing any work and results in termination of employment.

Fatality: Death of OGDCL's or contractor's workforce member caused by a work related incident, regardless of the time intervening between injury and death.

1.3 Constitution and Eligibility Criteria of Investigation Committee

- The investigation should be led by a person independent of the activities being investigated.
- Incident Investigation Committee for the Significant Incidents shall comprise of:
  - Investigation Committee Chairman
  - Investigation Committee Member-I (Operation)
  - Investigation Committee Member-II (HSE/ HR)
  - Investigation Committee Member-III (Optional; Workers' (Staff) Representative)
- The formation, constitution and eligibility criteria of the Investigation Committee is explained below:

Severity Level	Committee Appointed By	Eligibility		
		Committee Chairman	Committee Member-I	Committee Member-II
Catastrophic (5)	MD/ CEO	Executive Director	GM Operations	GM HSE
Critical (4)	MD/ CEO /CFO	Executive Director	GM/ Manager Operations	GM/ Manager HSE
Major (3)	Executive Director	GM HSE	Manager/ Chief Operations	Manager/ Chief HR Directorate
Marginal (2)	GM HSE	Manager/ Chief Operations	Medical Rep.	HSE Rep.
Negligible (1)	Location IC	Section IC	Medical Rep.	HSE Rep.

- Investigation Committee members must successfully complete formal training on Incident Investigation.
- Investigation Committee shall formulate the investigation report on a prescribed format attached with this procedure titled **Incident Investigation Report (IIR).**

2.0 Investigation Process

2.1 Planning

- The investigation Committee should conduct formal planning prior to collecting data and interviewing personnel. The following provide an overview of activities, but not limited to, that needs to be conducted:
  - The planning stage may normally commence with a presentation from the Location Management giving an overview of the incident sequence and operation of the site. This presentation is not to be used to draw preliminary conclusions but is used only to familiarize the investigation Committee with the operations and the event sequence.
  - A site visit by the investigation Committee should be conducted before the information collection begins.
  - Physical evidence should be collected, protected, preserved, evaluated and recorded to ultimately determine how and why failures occurred.
  - Evidence should be documented (sketched, mapped, photographed, video), preserved and secured by the investigating Committee.
  - Prior to the removal of any evidence, the exact location and orientation must be recorded or referenced to the incident location.
  - If the scene of incident is declared a crime scene, no evidence can be removed.
  - Facts and data gathering should be initiated as soon as possible after an incident to limit the information "decay" with time.

2.2 Interviewing

- Those personnel directly involved with the incident, including contractors and temporary staff, should be interviewed.
- The Investigation Committee shall develop a standard set of interview questions and determine the most appropriate means of documenting interviews.
- The Investigation Committee may adopt the 5W1H technique (i.e. Who; What; When; Where; Why and How type questions) during investigation process.

2.3 Establishing Events Timeline

- Identify the main incident event. This should be a single line statement usually describing the point in time when the incident occurred.
- Progress backward in time to identify the pre-incident sequence of sub-events from the information collected.
- Progress forward in time from the incident to identify the post-incident sub-event sequence.
- For each sub-event, detail of relevant conditions at the time of that event to be noted.
- Each sub-event and condition to be discretely numbered so that the Timeline can be reconstructed.
- Events that require further investigation should be clearly marked so that the relevant information be acquired.

2.4 Identify Failed / Missing Barrier(s)

- For any incident to occur, multiple barriers may have weakened or failed. Investigation Committee should determine why the barriers weakened or failed by assessing following Comprehensive List of Causes (CLCs):

2.4.1 Active Failures (Primary Surface Causes)

- Active failure is a factor which directly caused the incident. It is also called Primary Surface Cause of the Incident.
- An active failure is an element of unsafe or unsatisfactory behavior or condition prior to an incident event which is significant in initiating the event.
- Investigation Committee should determine why the active failure occurred and linking the replies with the other evidence.
- Active failures (Actions and Conditions) can take a variety of forms and Investigation Committee shall identify the pertinent failures form the chart mentioned in the **Incident Investigation Report (IIR)** template.

2.4.2 Preconditions (Contributory Causes)

- Preconditions are those conditions under which work is undertaken and that directly influence human or equipment performance.
- These are also sometimes mentioned as Contributory Cause which directly contributes to Active Failure.
- For each Active Failure, there can be a multiple number of Preconditions (Contributory Causes) and Investigation Committee shall identify the pertinent failures form the chart mentioned in the **Incident Investigation Report (IIR)** template. *(Contributory Causes are assigned distinct color scheme to be linked with Design Root Causes)*

2.4.3 Latent Failures (Design Root Causes)

- Latent Failures are HSE Management System failures which led to the pre-conditions of the incident. They are also mentioned as Design Root Causes and often ascribed to Elements of Management Systems or Elements of Performance Standards.
- Latent Failures (Design Root Causes) are linked with Preconditions (Contributory Causes) using a distinct color scheme as visible from the list mentioned below:

Leadership, Commitment & Accountability	Risk Assessment and Management	Training, Competence and Fitness	Documented Information and Communication	Design, Engineering and Construction	Operations & Maintenance	Contractors Management	Management of Change	Crisis & Emergency Preparedness and Planning	Incident Investigation and Analysis	Performance Measurement, Audit, Management Review, and Improvement

- Investigation Committee shall identify and elaborate the pertinent failures, gaps or deviations as design root causes in the **Incident Investigation Report (IIR)**.

2.5 Findings and Report Writing

- Assessment of all failed & missing barriers i.e. active failures (primary surface causes), preconditions (contributory causes) and latent failures (design root causes) shall be correlated and a comprehensive root cause analysis shall be summarized as findings.
- Immediate corrective measures as well as long-term corrective & preventive actions shall be determined along with timeframe.
- Standardized **Incident Investigation Report (IIR)** format shall be used for all investigations**.**

2.6 Close Out of Corrective & Preventive Actions

- Concerned HOD(s) shall be responsible to ensure that corrective and preventive actions are implemented as per prescribed timeframe.
- Subsequently based upon satisfactory follow-ups on the effectiveness of actions taken, the Investigation Report shall be closed out by HOD, HSEQ Department.

2.7 Communication of Lessons Learned

- Investigation Report shall be retained as evidence of type / nature of the incidents that have occurred and the results of corrective & preventive actions taken, including their effectiveness.
- The lessons learned from the incident shall be communicated across the organization and with relevant stakeholders as well.