**INCIDENT INVESTIGATION REPORT TEMPLATE**

< Mention Title of Incident Here >

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1. **CONSTITUTION OF INCIDENT INVESTIGATION COMMITTEE**

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| Ref. Section 1.3 of Incident Investigation Procedure. |

1. **SUMMARY OF INCIDENT**

|  |
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1. **FAILED / MISSING BARRIER(S)**

** SWISS CHEESE DIAGRAM  BOWTIE DIAGRAM**

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

**PROBABLE ACTIVE FAILURES (PRIMARY SURFACE CAUSES)**

**PROBABLE PRECONDITIONS (CONTRIBUTORY CAUSES)**

**LATENT FAILURES (DESIGN ROOT CAUSES)**

**SELECT MOST PROBABLE ACTIVE FAILURES (PRIMARY SURFACE CAUSES)**

|  |
| --- |
| **Actions** |
| **1.0 Following Procedures** | **2.0 Use of Tools or Equipment** | **3.0 Use of Protective Methods** | **4.0 Inattention / Lack of Awareness** |
|  | Violation by individual |  | Improper use of equipment |  | Lack of knowledge of hazards present |  | Improper decision making or lack of judgment |
|  | Violation by group |  | Improper use of tools |  | Personal protective equipment not used |  | Distracted by other concerns |
|  | Violation by supervisor |  | Use of defective equipment (aware) |  | Improper use of proper personal protective equipment |  | Inattention to footing and surroundings |
|  | Operation of equipment without authority |  | Use of defective tools (aware) |  | Servicing of energized equipment |  | Horseplay |
|  | Improper position or posture for the task |  | Improper placement of tools, equipment or materials |  | Equipment of materials not secured |  | Acts of violence |
|  | Overexertion of physical capability |  | Operation of equipment at improper speed |  | Disabled guards, warning systems or safety devices |  | Failure to warn |
|  | Work or motion at improper speed |  | Servicing of equipment in operation |  | Removal of guards, warning systems or safety devices |  | Use of drugs or alcohol |
|  | Improper lifting |  | Other |  | Personal protective equipment not available |  | Routine activity without thought |
|  | Improper loading |  |  |  | Other |  | Other |
|  | Shortcuts |  |  |  |  |  |  |
|  | Other |  |  |  |  |  |  |
| **Conditions** |
| **5.0 Protective System** | **6.0 Tools, Equipment and Vehicles** | **7.0 Work Exposure To** | **8.0 Workplace Environment / Layout** |
|  | Inadequate guards or protective devices |  | Defective equipment |  | Fire or explosion |  | Congestion or restricted motion |
|  | Defective guards or proactive devices |  | Inadequate equipment |  | Noise |  | Inadequate or excessive illumination |
|  | Inadequate personal protective equipment |  | Improperly prepared equipment |  | Energized electrical systems |  | Inadequate ventilation |
|  | Defective personal protective equipment |  | Defective tools |  | Energized systems, other than electrical |  | Unprotected height |
|  | Inadequate warning systems |  | Inadequate tools |  | Radiation |  | Workplace layoutcontrols  |
|  | Defective warning systems |  | Improperly prepared tools |  | Temperature extremes | - | *displays less than adequate* |
|  | Inadequate isolation of process or equipment |  | Defective vehicle |  | Hazardous chemicals | - | *labels less than adequate* |
|  | Inadequate safety devices |  | Inadequate vehicle for the purpose |  | Mechanical hazards | - | *locations out of reach or sight* |
|  | Defective safety devices |  | Improperly prepared vehicle |  | Clutter or debris | - | *conflicting information presented* |
|  | Other | 6.10 | Other |  | Storms or acts of nature |  | Other |
|  |  |  |  |  | Slippery floors or walkways |  |  |
|  |  |  |  |  | Other |  |  |

**SELECT MOST PROBABLE PRECONDITIONS (CONTRIBUTORY CAUSES)**

|  |
| --- |
| **Personal Factors** |
| **9.0 Physical Capability** | **10.0 Physical Condition** | **11.0 Mental State** | **12.0 Mental Stress** | **13.0 Behavior** | **14.0 Skills** |
|  | Vision deficiency |  | Previous injury orillness |  | Poor judgment |  | Preoccupied withproblems |  | Improper performance isrewarded |  | Inadequate assessmentof required skills |
|  | Hearing deficiency |  | Fatigue |  | Memory failure |  | Frustration | - | *saves time or effort* |  | Inadequate practice ofskill |
|  | Other sensory deficiency | - | *due to workload* |  | Poor coordination or reaction time |  | Confusingdirections/demands | - | *avoids discomfort* |  | Infrequent performanceof skill |
|  | Reduced respiratorycapacity | - | *due to lack of rest* |  | Emotional disturbance |  | ConflictingDirectionsdemands | - | *gains attention* |  | Lack of coaching onskill |
|  | Other permanentphysical disabilities | - | *due to sensory**overload* |  | Fears or phobias |  | Meaningless ordegrading activities |  | Improper supervision |  | Insufficient review ofinstruction to establishskill |
|  | Temporary disabilities |  | Diminished performance |  | Low mechanicalaptitude |  | Emotional overload |  | Inadequate identificationof critical safebehaviors |  | Other |
|  | Inability to sustain bodypositions | - | *due to temperature**extremes* |  | Low learning aptitude |  | Extreme judgmentdecisions/demands |  | Inadequatereinforcement of criticalsafe behaviors |  |  |
|  | Restricted range of bodymovement | - | *due to oxygen**deficiency* |  | Influenced bymedication |  | Extreme concentration/perception demands | - | *proper performance is**criticized* |  |  |
|  | Inadequate size or strength | - | *due to atmospheric pressure variation* |  | Other |  | Extreme boredom | - | *Inappropriate peer**pressure* |  |  |
|  | Substance sensitivitiesor allergies |  | Blood sugarinsufficiency |  |  |  | Other | - | *inadequate**performance feedback* |  |  |
|  | Diminished capacity dueto medication |  | Impairment due to use of drugor alcohol |  |  |  |  | - | *inadequate disciplinary**process* |  |  |
|  | Other |  | Other |  |  |  |  |  | *Inappropriate**aggression* |  |  |
|  |  |  |  |  |  |  |  |  | Improper use ofproduction incentives |  |  |
|  |  |  |  |  |  |  |  |  | Supervisor impliedhaste |  |  |
|  |  |  |  |  |  |  |  |  | Employee perceivedhaste |  |  |
|  |  |  |  |  |  |  |  |  | Other |  |  |
| **Job Factors** |
| **15.0 Training / Knowledge Transfer** | **16.0 Management / Supervision Employee Leadership** | **17.0 Contractor Selection****and Oversight** | **18.0 Engineering / Design** | **19.0 Work Planning** |
|  | Inadequate knowledgetransfer |  | Conflicting roles/responsibilities |  | Lack of contractor pre-qualifications |  | Inadequate technicaldesign |  | Inadequate workplanning |
| - | *inability to**comprehend* | - | *unclear reporting**relationships* |  | Inadequate contractor pre-qualifications | - | *design input obsolete* |  | Inadequate preventivemaintenance |
| - | *inadequate instruction**Qualifications* | - | *conflicting reporting**relationships* |  | Inadequate contractor selection | - | *design input not correct* | - | assessment of needs |
| - | *inadequate training**equipment* | - | *unclear assignment of**responsibility* |  | Use of non-approvedcontractor | - | *design input not**available* | - | lubrication/ servicing |
| - | *misunderstood**instructions* | - | *conflicting assignment of responsibility* |  | Lack of job oversight | - | *design output**inadequate* | - | adjustment/ assembly |
|  | Inadequate recall oftraining material | - | *improper or**insufficient delegation**of authority* |  | Inadequate oversight | - | *design input feasible* | - | clearing/ resurfacing |
| - | *training not reinforced**on the job* |  | Inadequate leadership |  | Other | - | *design output unclear* |  | Inadequate repair |
| - | *inadequate refresher**training frequency* | - | *standards of**performance missing or not enforced* |  |  | - | *design output not**correct* | - | *communication of**needed repair* |
|  | Inadequate trainingeffort | - | *inadequate**accountability* |  |  | - | *design output inconsistent* | - | *scheduling of work* |
| - | *inadequate training**program design* | - | *inadequate or incorrect**performance feedback* |  |  | - | *no independent design**Review* | - | *examination of parts* |
| - | *inadequate training**goals/ objectives* | - | *inadequate work site**walk-through* |  |  |  | Inadequate standards,specifications, and/ordesign criteria | - | *parts substitution* |
| - | *inadequate new**employee orientation* | - | *inadequate safety**Promotion* |  |  |  | Inadequate assessmentof potential failure |  | Excessive wear and tear |
| - | *inadequate initial**training* |  | Inadequate correction of prior hazard / incident |  |  |  | Inadequate ergonomic design | - | *inadequate planning**for use* |
| - | *inadequate means to**determine if qualified for job* |  | Inadequate identificationof worksite/ job hazards |  |  |  | Inadequate monitoringof construction | - | *extension of service**life* |
|  | No training provided |  | Inadequate managementof change system |  |  |  | Inadequate assessmentof operational readiness | - | *improper loading* |
| - | *need for training not**Identified* |  | Inadequate incidentreporting/ investigationsystem |  |  |  | Inadequate monitoringof initial operation | - | *use by untrained**people* |
| - | *training records**incorrect or out of date* |  | Inadequate or lack ofsafety meetings |  |  |  | Inadequate evaluationand/or documentation ofchange | - | *use for wrong purpose* |
| - | *new work methods**introduced without**training* |  | Inadequate performancemeasurement andassessment |  |  |  | Other |  | Inadequate referencematerials or publications |
| - | *decision made not to**Train* |  | Other |  |  |  |  |  | Inadequate audit/inspection/ monitoring |
|  | Other |  |  |  |  |  |  | - | *no documentation* |
|  |  |  |  |  |  |  |  | - | *no correction**responsibility assigned* |
|  |  |  |  |  |  |  |  | - | *no accountability for**corrective action* |
|  |  |  |  |  |  |  |  |  | Inadequate jobplacement |
|  |  |  |  |  |  |  |  | - | *appropriate personnel**not identified* |
|  |  |  |  |  |  |  |  | - | *appropriate personnel**not available* |
|  |  |  |  |  |  |  |  | - | *appropriate personnel**not provided* |
|  |  |  |  |  |  |  |  |  | Other |
| **Job Factors** |
| **20.0 Purchasing, Material****Handling and Material Control** | **21.0 Tools and Equipment** | **22.0 Work Rules (Policies, Standards & Procedures – PSP)** | **23.0 Communication** |
|  | Incorrect Items Received |  | Inadequate assessment of needs and risks |  | Lack of PSP for the task  |  | Inadequate horizontal communication between peers |
| - | *inadequate**specifications to vendor* |  | Inadequate human factors / ergonomics considerations | - | *lack of defined responsibility for PSP* |  | Inadequate vertical communication between supervisor and person |
| - | *inadequate specifications on requisition* |  | Inadequate standards orspecifications | - | *lack of job safety**Analysis* |  | Inadequate communication between different organizations |
| - | *inadequate control on changes to orders* |  | Inadequate availability  | - | *inadequate job safety analysis* |  | Inadequate communication between work groups |
| - | *unauthorized Substitution* |  | Inadequate adjustment / repair / maintenance |  | Inadequate development of PSP |  | Inadequate communication between shifts  |
| - | *inadequate product**Acceptance requirements* |  | Inadequate salvage and reclamation | - | *inadequate coordination with process / equipment design* |  | Inadequate communication methods |
| - | *no acceptance verification performed* |  | Inadequate removal / replacement of unsuitable items | - | *inadequate employee involvement in the development* |  | No communication method available |
|  | Inadequate research on materials / equipment |  | No equipment record history  | - | *inadequate definition of correction actions* |  | Incorrect instructions |
|  | Inadequate mode or route of shipment |  | Inadequate equipment record history | - | *inadequate format for easy use* |  | Inadequate communication due to job turnover |
|  | Improper handling of materials |  | Other |  | Inadequate implementation of PSP, due to deficiencies  |  | Inadequate communication of safety and health data, regulations or guidelines |
|  | Improper storage of materials or spare parts |  |  | - | *contradictory requirements* |  | Standard terminology not used |
|  | Inadequate materialpackaging |  |  | - | *confusing format* |  | Verification / repeat back techniques not used |
|  | Material shelf life exceeded |  |  | - | *more than one action per step* |  | Messages too long |
|  | Improper identificationof hazardous materials |  |  | - | *no check-off spaces provided* |  | Speech interference |
|  | Improper salvage and/or waste disposal |  |  | - | *inaccurate sequence of steps* |  | Other |
|  | Inadequate use of safety and health data |  |  | - | *confusing instructions* |  |  |
|  | Other |  |  | - | *technical error / missing steps* |  |  |
|  |  |  |  | - | *excessive references* |  |  |
|  |  |  |  | - | *potential situations not covered* |  |  |
|  |  |  |  |  | Inadequate enforcementof PSP |  |  |
|  |  |  |  | - | *inadequate monitoring**of work* |  |  |
|  |  |  |  | - | *inadequate supervisory**knowledge* |  |  |
|  |  |  |  | - | *inadequate**reinforcement* |  |  |
|  |  |  |  | - | *non-compliant not**corrected* |  |  |
|  |  |  |  |  | Inadequatecommunication of PSP |  |  |
|  |  |  |  | - | *incomplete distribution**to work groups* |  |  |
|  |  |  |  | - | *inadequate translation**to appropriate**languages* |  |  |
|  |  |  |  | - | *incomplete integration**with training* |  |  |
|  |  |  |  | - | *out of date revisions**still in use* |  |  |
|  |  |  |  |  | Other |  |  |

**ANALYSIS OF 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.**
* **Investigation Committee shall identify and elaborate the pertinent gaps or deviations as design root causes.**

|  |  |  |
| --- | --- | --- |
| **#** | **HSE System Element** | **Detail of Gap / Deviation** |
|  | **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 Reviews and Improvement** |  |

1. **FINDINGS**

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.

1. **RECOMMENDATIONS**

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| Immediate corrective measures as well as long-term corrective & preventive actions shall be jot down along with timeframe. |

1. **ANNEXURES**