INCIDENT INVESTIGATION REPORT

TEMPLATE

< Mention Title of Incident Here >

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1. CONSTITUTION OF INCIDENT INVESTIGATION COMMITTEE

Ref. Section 1.3 of Incident Investigation Procedure.

2. SUMMARY OF INCIDENT

- DATE, TIME, AND SPECIFIC LOCATION OF INCIDENT
- NAMES, JOB TITLES, AND EMPLOYEES / CONTRACTORS INVOLVED AND IMMEDIATE SUPERVISOR(S)
- NAMES AND STATEMENTS OF WITNESSES
- EVENTS LEADING UP TO INCIDENT
- EXACTLY WHAT EMPLOYEE / CONTRACTOR WAS DOING AT THE MOMENT OF THE ACCIDENT
- ENVIRONMENTAL CONDITIONS
- CIRCUMSTANCES (INCLUDING TASKS, EQUIPMENT, TOOLS, MATERIALS, PPE, ETC.)
- SPECIFIC INJURIES (INCLUDING PART(S) OF BODY INJURED AND NATURE AND EXTENT OF INJURIES)
- TYPE OF TREATMENT FOR INJURIES
- DAMAGE TO ENVIRONMENT, EQUIPMENT, MATERIALS, ETC.
- FLOWCHARTS / SKETCHES / PICTURES

3. 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)

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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	
1.1.	Violation by individual	2.1.	Improper use of equipment	3.1.	Lack of knowledge of hazards present	4.1.	Improper decision making or lack of judgment
1.2.	Violation by group	2.2.	Improper use of tools	3.2.	Personal protective equipment not used	4.2.	Distracted by other concerns
1.3.	Violation by supervisor	2.3.	Use of defective equipment (aware)	3.3.	Improper use of proper personal protective equipment	4.3.	Inattention to footing and surroundings
1.4.	Operation of equipment without authority	2.4.	Use of defective tools (aware)	3.4.	Servicing of energized equipment	4.4.	Horseplay
1.5.	Improper position or posture for the task	2.5.	Improper placement of tools, equipment or materials	3.5.	Equipment of materials not secured	4.5.	Acts of violence
1.6.	Overexertion of physical capability	2.6.	Operation of equipment at improper speed	3.6.	Disabled guards, warning systems or safety devices	4.6.	Failure to warn
1.7.	Work or motion at improper speed	2.7.	Servicing of equipment in operation	3.7.	Removal of guards, warning systems or safety devices	4.7.	Use of drugs or alcohol
1.8.	Improper lifting	2.8.	Other	3.8.	Personal protective equipment not available	4.8.	Routine activity without thought
1.9.	Improper loading			3.9.	Other	4.9.	Other
1.10.	Shortcuts						
1.11.	Other						

Conditions

5.0 Protective System		6.0 Tools, Equipment and Vehicles		7.0 Work Exposure To		8.0 Workplace Environment / Layout	
5.1.	Inadequate guards or protective devices	6.1.	Defective equipment	7.1.	Fire or explosion	8.1.	Congestion or restricted motion
5.2.	Defective guards or proactive devices	6.2.	Inadequate equipment	7.2.	Noise	8.2.	Inadequate or excessive illumination
5.3.	Inadequate personal protective equipment	6.3.	Improperly prepared equipment	7.3.	Energized electrical systems	8.3.	Inadequate ventilation
5.4.	Defective personal protective equipment	6.4.	Defective tools	7.4.	Energized systems, other than electrical	8.4.	Unprotected height
5.5.	Inadequate warning	6.5.	Inadequate tools	7.5.	Radiation	8.5.	Workplace layout

	systems						controls
5.6.	Defective warning systems	6.6.	Improperly prepared tools	7.6.	Temperature extremes	-	*displays less than adequate*
5.7.	Inadequate isolation of process or equipment	6.7.	Defective vehicle	7.7.	Hazardous chemicals	-	*labels less than adequate*
5.8.	Inadequate safety devices	6.8.	Inadequate vehicle for the purpose	7.8.	Mechanical hazards	-	*locations out of reach or sight*
5.9.	Defective safety devices	6.9.	Improperly prepared vehicle	7.9.	Clutter or debris	-	*conflicting information presented*
5.10.	Other	6.10	Other	7.10	Storms or acts of nature	8.6.	Other
				7.11	Slippery floors or walkways		
				7.12	Other		

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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**	
9.1.	Vision deficiency	10.1.	Previous injury or illness	11.1.	Poor judgment	12.1.	Preoccupied with problems	13.1	Improper performance is rewarded	14.1.	Inadequate assessment of required skills
9.2.	Hearing deficiency	10.2.	Fatigue	11.2.	Memory failure	12.2.	Frustration	-	*saves time or effort*	14.2.	Inadequate practice of skill
9.3.	Other sensory deficiency	-	*due to workload*	11.3.	Poor coordination or reaction time	12.3.	Confusing directions/demands	-	*avoids discomfort*	14.3.	Infrequent performance of skill
9.4.	Reduced respiratory capacity	-	*due to lack of rest*	11.4.	Emotional disturbance	12.4.	Conflicting Directions demands	-	*gains attention*	14.4.	Lack of coaching on skill
9.5.	Other permanent physical disabilities	-	*due to sensory overload*	11.5.	Fears or phobias	12.5.	Meaningless or degrading activities	13.2	Improper supervision	14.5.	Insufficient review of instruction to establish skill
9.6.	Temporary disabilities	10.3.	Diminished performance	11.6.	Low mechanical aptitude	12.6.	Emotional overload	13.3	Inadequate identification of critical safe behaviors	14.6.	Other
9.7.	Inability to sustain body positions	-	*due to temperature extremes*	11.7.	Low learning aptitude	12.7.	Extreme judgment decisions/demands	13.4	Inadequate reinforcement of critical safe behaviors		
9.8.	Restricted range of body movement	-	*due to oxygen deficiency*	11.8.	Influenced by medication	12.8.	Extreme concentration/ perception demands	-	*proper performance is criticized*		
9.9.	Inadequate size or strength	-	*due to atmospheric pressure variation*	11.9.	Other	12.9.	Extreme boredom	-	*Inappropriate peer pressure*		
9.10.	Substance sensitivities or allergies	10.4.	Blood sugar insufficiency			12.10	Other	-	*inadequate performance feedback*		
9.11.	Diminished capacity due to medication	10.5.	Impairment due to use of drug					-	*inadequate disciplinary process*		

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			or alcohol
9.12.	Other	10.6.	Other

13.5	*Inappropriate aggression*
13.6	Improper use of production incentives
13.7	Supervisor implied haste
13.8	Employee perceived haste
13.9	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	
15.1.	Inadequate knowledge transfer	16.1.	Conflicting roles/ responsibilities	17.1.	Lack of contractor pre-qualifications	18.1.	Inadequate technical design	19.1.	Inadequate work planning
-	*inability to comprehend*	-	*unclear reporting relationships*	17.2.	Inadequate contractor pre-qualifications	-	*design input obsolete*	19.2.	Inadequate preventive maintenance
-	*inadequate instruction Qualifications*	-	*conflicting reporting relationships*	17.3.	Inadequate contractor selection	-	*design input not correct*	-	assessment of needs
-	*inadequate training equipment*	-	*unclear assignment of responsibility*	17.4.	Use of non-approved contractor	-	*design input not available*	-	lubrication/ servicing
-	*misunderstood instructions*	-	*conflicting assignment of responsibility*	17.5.	Lack of job oversight	-	*design output inadequate*	-	adjustment/ assembly
15.2.	Inadequate recall of training material	-	*improper or insufficient delegation of authority*	17.6.	Inadequate oversight	-	*design input feasible*	-	clearing/ resurfacing
-	*training not reinforced on the job*	16.2.	Inadequate leadership	17.7.	Other	-	*design output unclear*	19.3.	Inadequate repair
-	*inadequate refresher*	-	*standards of*			-	*design output*	-	*communication*

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	training frequency		*performance missing or not enforced*		*not correct*		*of needed repair*
15.3.	Inadequate training effort	-	*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*	18.2.	Inadequate standards, specifications, and/or design criteria	-	*parts substitution*
-	*inadequate new employee orientation*	-	*inadequate safety Promotion*	18.3.	Inadequate assessment of potential failure	19.4.	Excessive wear and tear
-	*inadequate initial training*	16.3.	Inadequate correction of prior hazard / incident	18.4.	Inadequate ergonomic design	-	*inadequate planning for use*
-	*inadequate means to determine if qualified for job*	16.4.	Inadequate identification of worksite/ job hazards	18.5.	Inadequate monitoring of construction	-	*extension of service life*
15.4.	No training provided	16.5.	Inadequate management of change system	18.6.	Inadequate assessment of operational readiness	-	*improper loading*
-	*need for training not Identified*	16.6.	Inadequate incident reporting/ investigation system	18.7.	Inadequate monitoring of initial operation	-	*use by untrained people*
-	*training records incorrect or out of date*	16.7.	Inadequate or lack of safety meetings	18.8.	Inadequate evaluation and/or documentation of change	-	*use for wrong purpose*
-	*new work methods introduced without training*	16.8.	Inadequate performance measurement and assessment	18.9.	Other	19.5.	Inadequate reference materials or publications

-	*decision made not to Train*

16.9. Other

15.5. Other

19.6.	Inadequate audit/ inspection/ monitoring
-	*no documentation*
-	*no correction responsibility assigned*
-	*no accountability for corrective action*
19.7.	Inadequate job placement
-	*appropriate personnel not identified*
-	*appropriate personnel not available*
-	*appropriate personnel not provided*

19.8. 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	
20.1.	Incorrect Items Received	21.1.	Inadequate assessment of needs and risks	22.1.	Lack of PSP for the task	23.1.	Inadequate horizontal communication between peers
-	*inadequate specifications to vendor*	21.2.	Inadequate human factors / ergonomics considerations	-	*lack of defined responsibility for PSP*	23.2.	Inadequate vertical communication between supervisor and person
-	*inadequate specifications on requisition*	21.3.	Inadequate standards or specifications	-	*lack of job safety Analysis*	23.3.	Inadequate communication between different organizations
-	*inadequate control on changes to orders*	21.4.	Inadequate availability	-	*inadequate job safety analysis*	23.4.	Inadequate communication between work groups
-	*unauthorized Substitution*	21.5.	Inadequate adjustment / repair / maintenance	22.2.	Inadequate development of PSP	23.5.	Inadequate communication between shifts
-	*inadequate product Acceptance requirements*	21.6.	Inadequate salvage and reclamation	-	*inadequate coordination with process / equipment design*	23.6.	Inadequate communication methods

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-	*no acceptance verification performed*	21.7.	Inadequate removal / replacement of unsuitable items	-	*inadequate employee involvement in the development*	23.7.	No communication method available
20.2.	Inadequate research on materials / equipment	21.8.	No equipment record history	-	*inadequate definition of correction actions*	23.8.	Incorrect instructions
20.3.	Inadequate mode or route of shipment	21.9.	Inadequate equipment record history	-	*inadequate format for easy use*	23.9.	Inadequate communication due to job turnover
20.4.	Improper handling of materials	21.10	Other	22.3.	Inadequate implementation of PSP, due to deficiencies	23.10.	Inadequate communication of safety and health data, regulations or guidelines
20.5.	Improper storage of materials or spare parts			-	*contradictory requirements*	23.11.	Standard terminology not used
20.6.	Inadequate material packaging			-	*confusing format*	23.12.	Verification / repeat back techniques not used
20.7.	Material shelf life exceeded			-	*more than one action per step*	23.13.	Messages too long
20.8.	Improper identification of hazardous materials			-	*no check-off spaces provided*	23.14.	Speech interference
20.9.	Improper salvage and/or waste disposal			-	*inaccurate sequence of steps*	23.15.	Other
20.10	Inadequate use of safety and health data			-	*confusing instructions*		
20.11	Other			-	*technical error / missing steps*		
				-	*excessive references*		
				-	*potential situations not covered*		
				22.4.	Inadequate enforcement of PSP		
				-	*inadequate monitoring of work*		
				-	*inadequate supervisory knowledge*		
				-	*inadequate reinforcement*		
				-	*non-compliant not corrected*		
				22.5.	Inadequate communication of PSP		
				-	*incomplete distribution*		

	to work groups
-	*inadequate translation to appropriate languages*
-	*incomplete integration with training*
-	*out of date revisions still in use*

22.6. 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
a.	Leadership, Commitment & Accountability	
b.	Risk Assessment and Management	
c.	Training, Competence and Fitness	
d.	Documented Information and Communication	
e.	Design, Engineering and Construction	
f.	Operations & Maintenance	
g.	Contractors Management	
h.	Management of Change	
i.	Crisis & Emergency Preparedness and Planning	
j.	Incident Investigation and Analysis	
k.	Performance Measurement, Audit, Management Reviews and Improvement	

4. 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.

5. RECOMMENDATIONS

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

6. ANNEXURES