1 · DANGER_ZONE_INTRUSION

Work Instruction

1 . Purpose

To standardize the real-time detection, control, and reporting procedures when any person—employee, contractor, or visitor—enters a designated danger-zone (ROI polygon), thereby preventing personnel injury.

2 . Scope

Applies to every danger-zone monitored by SafeGuard AI across all facilities and to all site personnel and visitors.

3 . Detection & Alerting

- Edge-deployed AI cameras continuously detect human silhouettes inside the ROI polygon.
- Upon detection, a first-pass inference is executed on the camera; event metadata and the snapshot are forwarded to the cloud analytics platform.
- The platform reassesses risk and issues multi-channel alerts: dashboard pop-up, SMS, and on-premise beacon/siren.

4 . Immediate Response Procedure

Step	Responsible	Action	Completion Target
① Acknowledge Alarm	Zone Guard	Confirm visual and audible alarm; declare “Safety Code RED.”	≤ 1 min
② Block Access	Zone Guard & Nearby Workers	Broadcast verbal warning; deploy physical barrier tape.	ROI cleared
③ Verify Situation	Safety Team	Dual check (camera + direct sight); assess injuries.	Checklist signed
④ Neutralize Hazard	Maintenance Team	De-energize machinery or halt process.	Interlock active
⑤ Report	Control Room	Submit EHS incident report via portal.	≤ 10 min

5 . Follow-Up Actions

- Root-cause analysis meeting within 24 h.

- If repeated, redesign ROI boundary and add cameras; push OTA configuration update.

6 . Records & Training

- Logs auto-archived in DynamoDB for five years; KPI review monthly.
- Incorporate this instruction into new-hire safety orientation.

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2 · VEHICLE_ENTERED

Work Instruction

1 . Purpose
To prevent collisions and crush injuries when forklifts, trucks, or other vehicles enter zones designated for pedestrian-only traffic.

2 . Risk Scenario
Vehicle enters congested aisle → blind spot → potential pedestrian strike.

3 . Detection & Alerting

- AI camera identifies vehicle object, type, and license plate.
- Dashboard highlights vehicle ID; edge device triggers siren and red beacon in the aisle.

4 . Immediate Response Procedure

1. Control Room – Dispatch traffic marshal; track vehicle via CCTV hand-off chain.
2. Traffic Marshal – Guide pedestrians to refuge area; enforce ≤ 5 km/h speed.
3. Driver – Obey marshal instructions; stop if deviating from route.
4. Safety Team – Investigate root cause (work order error, route design flaw).

5 . Follow-Up & Metrics

- Install boom gate or LED warning signs if recurrence observed.
- KPI: “Unplanned vehicle entries” maintained at 0 per month.

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3 · UNAUTHORIZED_ACCESS

Work Instruction

1 . Purpose
To protect critical assets and prevent process disruption when an un-badged or unregistered individual approaches a secured area.

2 . Detection Criteria

- Facial features, attire, or helmet RFID do not match access database.
- AI forwards image to cloud, where facial/badge verification runs against HR and security DBs.

3 . Immediate Response Procedure

Seq.	Actor	Action	Time Limit
① Receive Alert	Control Room	Lock camera view; begin live tracking.	30 s
② Interdict	Security Guard	Detain person; request ID.	2 min
③ Verify Identity	HR / Security	Cross-check HR system.	5 min
④ Report	Security Lead	File security incident report.	30 min

4 . Post-Incident Management

- Update access privileges; weekly security sweep.
- Push new employee photos to edge devices for model refresh.

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4 · FIRE_ALERT

Work Instruction

1 . Purpose
To minimize loss of life and property when smoke, flames, or abnormal temperature rise are detected.

2 . Detection & Alerting

- Multispectral AI cameras (smoke/flame) plus temperature sensor fusion.
- “FIRE ALERT” triggers: SMS blast, evacuation siren, and automatic sprinkler activation.

3 . Emergency Response Flow

1. On-Site Workers – Hit emergency stop; evacuate via marked routes.
2. Fire Captain – Deploy extinguishers/hydrants; classify fire grade.
3. Control Room – Notify Fire Department (119); engage equipment interlocks.
4. EHS Team – Archive video/logs to S3; initiate incident investigation.

4 . Recovery & Restart

- Re-entry only after Fire Department declares “All-Clear,” toxic gas levels tested, and equipment passes safety check.
- Restart approval chain: Plant Manager → EHS → Production.

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5 · NO_ENTRY_VIOLATION

Work Instruction

1 . Purpose
To prevent high-risk incidents when personnel enter a strictly prohibited area.

2 . Detection Logic

- Camera ROI + PPE analytics produce event when combination “No-Entry + Human” is true.
- If edge-calculated risk ≥ High, event is sent to cloud and dashboard flashes red marker.

3 . Immediate Response Steps

Step	Responsible	Action	Note
① Alarm	On-Site PA System	Siren + audio warning	Auto
② Evacuate	Workers & Guard	Move outside no-entry line	≤ 1 min
③ Eliminate Hazard	Maintenance	Isolate energy; apply Lockout/Tagout (LOTOTO).	LOTOTO

Step	Responsible	Action	Note
④ Document	Control Room	Verify event log; issue incident card.	DynamoDB

4 . Education & Prevention

- Monthly “ZERO No-Entry Violations” campaign.
- Reevaluate ROI and camera placement every six months.

Common References

- Data Retention: All event logs are stored in S3/DynamoDB for five years; vector data indexed in OpenSearch to retrain generative AI models.
- Performance Validation: Pilot deployment achieved 75 % reduction in safety incidents and average response time of 2 minutes.
- Document Control: These work instructions are registered in the Quality Management System (QMS); any revision triggers coordinated AI camera firmware updates.

How to Use

Copy each block into your A4 company form, adjust branding or numbering as needed, and circulate to relevant teams. Because every instruction shares a unified structure, employees will quickly recognize the format and understand the required actions for each abnormal condition.