



NATIONAL CONTINGENCY PLAN

FOR

INDUSTRIAL AND TECHNICAL DISASTERS

Rehearse

Rescue

Relief

Recover

Rebuild

Rehab

Review

2026

This document has been prepared under the patronage of
Lieutenant General Inam Haider Malik HI(M), Chairman NDMA

EDITORIAL TEAM

Brigadier Kamran Ahmed, [Member \(Operations & Logistics\); NDMA](#)

Colonel Manzoor Ahmed

[Director \(Logistics\)](#)

Squadron Leader Ghazanfar Bashir

[Deputy Director \(Logistics\)](#)

Mr. Salman Amjad

[Manager \(Logistics\)](#)

Mr. Shanawar Sultan Awan

[Deputy Manager \(Logistics\)](#)

Mr. Zaid Nawaz Malik

[Assistant Manager \(Logistics\)](#)

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LIST OF ACRONYMS

Acronym	Full Form
NDMA	National Disaster Management Authority
NEOC	National Emergency Operations Centre
PDMA	Provincial Disaster Management Authority
DDMA	District Disaster management Authority
PEOC	Provincial Emergency Operations Centre
NCOP	National Common Operating Picture
EOC	Emergency Operations Centre
NGO	Non-Governmental Organization
INGO	International Non-Governmental Organization
BBB	Build Back Better
AAR	After-Action Review
SEZ	Special Economic Zone
SITREP	Situation Report
EPA	Environmental Protection Agency
ICS	Incident Command System
NEOC	National Emergency Operations Centre
GCOP	Global Common Picture
HazMat	Hazardous Materials

INTRODUCTION

1. Pakistan's industrial and technical sectors have expanded significantly due to rapid industrialization, urbanization, infrastructure development, energy projects, mining activities and establishment of Special Economic Zones (SEZs). This growth has resulted in development of industrial estates, refineries, power plants, ports, logistics hubs and extensive hazardous material transportation networks across the country. While industrial growth contributes to economic progress, it also increases exposure to industrial and technical hazards. Industrial fires, explosions, chemical spills, hazardous material releases, structural failures, mining accidents and critical infrastructure disruptions can cause significant human, environmental, economic and operational consequences.
2. The National Contingency Plan for Industrial & Technical Disasters was developed before the promulgation of National Disaster Management Authority (NDMA) Act, 2010, under which disaster management became a devolved subject. This fundamentally redefined Pakistan's disaster management architecture, establishing District Administrations/ District Disaster Management Authorities (DDMAs) as first responders, Provincial Governments/ Provincial Disaster Management Authorities (PDMAs) as second-tier responders and NDMA as the national coordinating, facilitating and policy-guiding authority.
3. In view of evolving industrial risk landscape, expanding industrial base and changing institutional framework, National Contingency Plan for Industrial & Technical Disasters 2026 has been developed to provide a coordinated national framework for preparedness, prevention, response, stabilization and early recovery. The Plan strengthens federal-provincial coordination, establishes escalation mechanisms and promotes integrated preparedness among all stakeholders.
4. Provincial Governments, PDMAs, District Administrations, regulatory authorities and industrial operators are encouraged to develop and periodically update their respective contingency plans in accordance with this framework and share them with NDMA for coordination and harmonization. This will enhance interoperability, readiness and coordinated response across all tiers. Effective implementation of this Plan requires sustained commitment, regulatory compliance, capacity development, regular exercises and close coordination among all stakeholders. Through a coordinated and risk-informed approach, Pakistan can strengthen industrial safety, protect communities and critical infrastructure and enhance national resilience against industrial and technical disasters.
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EXECUTIVE SUMMARY

1. **Context.** Pakistan's expanding industrial base, urbanization, energy infrastructure, SEZs and increasing movement of hazardous materials have significantly elevated risk of industrial and technological disasters, including fires, explosions, toxic releases, hazardous material incidents, environmental contamination and critical infrastructure failures.
2. **Purpose.** National Contingency Plan for Industrial & Technical Disasters 2026 establishes a unified national framework for preparedness, prevention, response, recovery and capability development. Developed under National Disaster Management Act, 2010, it strengthens national resilience while supporting safe and sustainable industrial growth.
3. **Response Framework.** Plan adopts three tiered response mechanism whereby industrial operators, District Administrations, DDMA's and emergency services serve as first responders; Provincial Governments and PDMA's provide operational support and resource augmentation; while NDMA performs national-level coordination, facilitation and strategic support during major emergencies. Incident Command System (ICS) serves as standard framework for command, control and coordination.
4. **Strategic Focus Areas.** Plan focuses on industrial risk assessment, emergency preparedness, firefighting and Hazardous Material (HazMat) response, environmental protection, recovery and rehabilitation, capability development, strategic resource positioning, training and exercises, multi-agency coordination and institutional learning. It further promotes industrial safety, community awareness, public information management and critical infrastructure resilience.
5. **Way Forward.** With industrial and technological risks expected to grow, effective implementation of this Plan will require sustained coordination, strengthened provincial and district capacities, improved industrial safety culture, regular exercises and continued commitment by all stakeholders to enhance national preparedness and resilience.

CHAPTER - 1

NATIONAL CONTEXT & SCOPE

1. **Overview.** Chapter establishes national context, rationale, scope, objectives and guiding principles of National Contingency Plan for Industrial & Technical Disasters 2026. It defines intent of Plan and provides foundation for a coordinated national framework to manage industrial and technical emergencies in Pakistan.

2. **National Industrial Growth and Emerging Risk Landscape.** Pakistan's industrial

and technical landscape has expanded significantly over last two decades due to rapid urbanization, industrialization, infrastructure development, energy expansion, mining activities, establishment of SEZs and increased movement of hazardous materials across the country. Major industrial estates, refineries, petrochemical installations, power generation facilities, mining operations, storage terminals, transport corridors, ports and logistics

Technical & Industrial Disasters in Pakistan



hubs form a critical component of national economic growth and strategic infrastructure. While industrial growth contributes to economic development, employment generation, energy security and trade facilitation, it simultaneously increases exposure to industrial and technological hazards capable of causing large-scale human, environmental, economic and infrastructural losses. Pakistan's industrial risk profile is further intensified by expansion of industrial zones near densely populated urban areas, hazardous material transportation through major cities and corridors, aging industrial infrastructure in certain sectors, limited compliance with industrial safety standards in some facilities, increasing energy and fuel transportation requirements, climate-related stresses on industrial systems including flooding and extreme heat and uneven emergency preparedness capacities across regions.

3. **Nature and Complexity of Industrial & Technical Disasters.** Industrial and technical disasters differ fundamentally from natural disasters due to their sudden onset and rapid escalation, high intensity and concentrated impact, requirement for specialized technical response, potential for cascading and compound effects, long-term environmental and public health consequences and immediate disruption of critical infrastructure and essential services. Industrial accidents involving toxic gas releases, chemical spills, industrial fires, explosions, structural failures, pipeline ruptures, hazardous material transport

accidents, mining collapses and energy system failures can overwhelm district and provincial capacities within minutes if not managed through coordinated preparedness and response mechanisms. In view of these realities, a modern, coordinated and operationally aligned national contingency framework is essential to strengthen preparedness, support provincial response systems, protect communities and ensure continuity of critical national functions during industrial and technical disasters.

4. **Rationale for National Contingency Plan.** National Contingency Plan for Industrial & Technical Disasters 2026 has been developed to provide a unified national framework for coordinated preparedness, response, stabilization and early recovery during industrial and technical emergencies. Earlier contingency framework was developed prior to the promulgation of NDMA Act, 2010, when disaster management was not a devolved subject. Following these legal and constitutional developments, disaster management responsibilities are now exercised through a devolved governance structure where District Administrations and DDMA's function as first responders, Provincial Governments and PDMA's function as second-tier responders and NDMA functions as national coordinating, facilitating and policy-guiding authority. Industrial and technical disasters frequently require specialized HazMat response capabilities, advanced firefighting and containment systems, technical engineering expertise, toxicology and burn-care support, environmental monitoring and decontamination, inter-provincial coordination mechanisms and rapid mobilization of national resources. In absence of a harmonized national framework, response operations may suffer from delayed mobilization of specialized assets, fragmented coordination among agencies, duplication of efforts, information management gaps, inconsistent command and reporting systems and weak interoperability between federal and provincial stakeholders. This Plan therefore establishes a nationally coordinated system that supports provincial response structures while enabling timely federal facilitation and strategic coordination during major large scale industrial disasters.

5. **Aim/ Objectives of Plan.** Aim of this Plan is to establish a unified national framework for coordinated preparedness, response, stabilization and early recovery during industrial and technical disasters in Pakistan. Objectives of National Contingency Plan are to establish a clear national coordination framework for industrial and technical disasters, define roles and responsibilities of relevant stakeholders in support of provincial and district authorities, standardize command, control, communication and reporting arrangements, enable rapid mobilization of specialized national capabilities and technical resources, facilitate inter-provincial coordination and mutual support mechanisms, strengthen preparedness, prevention and risk reduction measures, improve integration between regulatory authorities, emergency services and industry operators, facilitate coordinated

public information and warning mechanisms, institutionalize lessons learned, exercises and continuous improvement processes and support safe industrial development and protection of critical infrastructure.

6. **Scope and Applicability.** Plan applies to industrial and technical disasters that exceed coping capacity of a district or province, require federal coordination or technical assistance, have actual or potential cross-jurisdictional impacts, threaten critical infrastructure or essential services, require inter-provincial resource mobilization, or require international technical or humanitarian assistance. Scope includes chemical and toxic substance releases, industrial fires and explosions, pipeline ruptures and terminal incidents, structural failures of industrial facilities, hazardous materials transport accidents, power generation and technical failures, mining and underground incidents, large-scale industrial contamination events, major port and logistics terminal incidents and industrial accidents with cascading multi-sector impacts. This Plan applies to incidents occurring at industrial estates and SEZs, refineries and petrochemical facilities, storage depots and fuel terminals, ports and logistics hubs, energy infrastructure installations, mining and extractive sites, hazardous material transport corridors, manufacturing and processing facilities. Plan covers preparedness, immediate response, stabilization and early recovery coordination phases of industrial disaster management, while long-term reconstruction, compensation mechanisms and sector-specific reforms remain responsibility of relevant ministries, provincial governments and regulatory authorities.

7. **Guiding Principles.** Implementation of Plan shall be guided by principles including subsidiarity and local primacy, whereby response operations are initiated at lowest appropriate level with district and provincial authorities retaining primary responsibility; coordination aspects at Federal level to reinforce provincial systems without superseding authority; tiered escalation based on severity, complexity and resource shortfalls; unity of effort to ensure coherence of actions and effective resource utilization; protection of life, environment and critical infrastructure as foremost priority; risk-informed decision-making based on technical assessments, situational awareness; transparency and accountability in information sharing/ communication; multi-stakeholder coordination integrating government institutions, regulators, industry operators, emergency services and technical agencies.

8. **Relationship with Provincial and District Plans.** Plan does not replace Provincial or District Contingency Plans and Provincial Governments, PDMAAs and District Administrations remain responsible for preparedness and operational response within their jurisdictions. National Contingency Plan provides national coordination mechanisms, common operational terminology and standards, federal support and escalation procedures, inter-provincial coordination arrangements, information sharing and reporting formats and

mechanisms for mobilization of national capabilities. Provincial Governments shall develop and maintain compatible contingency plans aligned with national policy parameters and operational standards.

9. **Intended Users of Plan.** Plan is intended for use by NDMA, Federal Ministries and Divisions, PDMA, DDMA, emergency services and first responders, regulatory and technical agencies, Armed Forces and specialized support providers, industry operators and critical infrastructure managers, development partners and humanitarian organizations, training and academic institutions involved in disaster management.

10. **Review and Updating Mechanism.** Plan is a living document and shall be reviewed periodically to reflect emerging industrial and technological risks, expansion of industrial infrastructure and corridors, lessons learned from incidents and exercises, technological advancements and evolving response capabilities and changes in legal, institutional and regulatory arrangements. NDMA shall maintain version control and coordinate periodic review and updating of Plan in consultation with federal ministries, provincial authorities, regulators and technical stakeholders.

CHAPTER - 2

POLICY, LEGAL MANDATE & FEDERAL - PROVINCIAL INTERFACE

1. Overview

- a. Industrial and technical disasters constitute one of the most complex categories of emergencies due to their sudden onset, high intensity, cascading consequences, environmental implications and requirement for highly specialized response capabilities. Pakistan's rapidly expanding industrial landscape - comprising SEZs, industrial estates, oil and gas infrastructure, ports, refineries, mining zones, chemical industries, fertilizer plants, energy corridors, hazardous material transport networks and dense urban-industrial interfaces has significantly increased national exposure to technological and industrial hazards.
- b. Industrial emergencies including toxic gas releases, chemical spills, industrial fires, explosions, pipeline failures, structural collapse, hazardous material transport accidents, refinery incidents, mining accidents and energy system failures can rapidly overwhelm local response capacities within minutes and may result in mass casualties, environmental contamination, infrastructure disruption, displacement of populations, economic losses and long-term public health impacts.
- c. This chapter establishes legal, institutional, policy, operational and coordination framework for industrial and technical disaster management in Pakistan. It defines the mandates, coordination responsibilities, escalation mechanisms and operational relationships among federal, provincial, district, industrial, regulatory and local stakeholders under NDMA Act, 2010.
- d. The framework promotes a combined approach (government as well as society) based on preparedness, prevention, mitigation, anticipatory action, industrial compliance, technological integration, interoperability, resilience-building and coordinated response management.

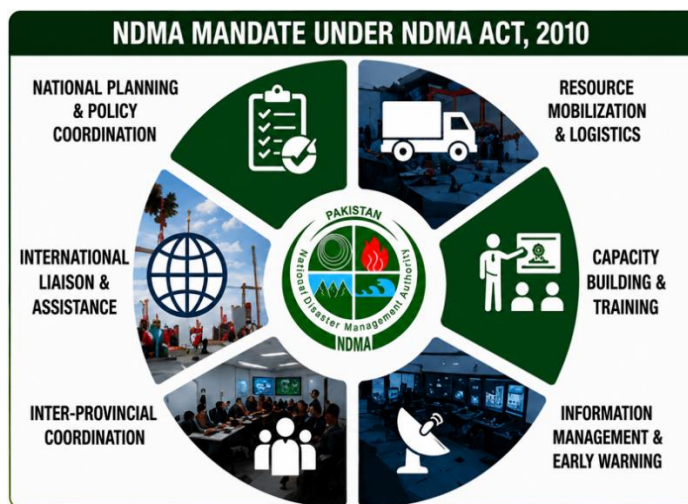
2. National Disaster Management Architecture

- a. Pakistan's disaster management system operates under NDMA Act, 2010 through a three-tiered institutional structure comprising federal, provincial and district levels. System integrates disaster management authorities with industrial regulators, technical institutions, emergency responders, environmental agencies, infrastructure operators, hazardous industries and humanitarian stakeholders.

- b. At federal level, NDMA serves as apex national authority responsible for policy formulation, strategic coordination, capacity development, standardization, inter-provincial coordination, resource mobilization and international cooperation in disaster management.
- c. At provincial and regional level, PDMAs, SDMA, GBDMA and CES are responsible for operational planning, preparedness, resource management, response coordination and support to district authorities.
- d. At district level, DDMA, operating through district administrations, serve as primary operational entities for local preparedness, emergency response, evacuation management, public safety and coordination of field-level operations.
- e. Industrial and Technical Disaster Management requires coordinated engagement of the following stakeholders:
- (1) **NDMA, PDMAs/ SDMA/ GBDMA, CES & DDMA**. Responsible for policy implementation, coordination, preparedness, response management, resource mobilization and recovery support at their respective levels.
 - (2) **Industrial Regulators and Technical Authorities**. Responsible for regulation, licensing, inspection, enforcement of safety standards, hazardous material management and technical oversight of industrial operations.
 - (3) **Emergency Response Organizations**. Including rescue services, fire brigades, civil defence, emergency medical services, law enforcement agencies and specialized HazMat response units responsible for emergency interventions and life-saving operations.
 - (4) **Armed Forces**. Provide specialized capabilities including search and rescue, aviation support, engineering assistance, communications, logistics, mobility and surge response during major emergencies.
 - (5) **Local Governments and Municipal Authorities**. Responsible for civic services, emergency sanitation, debris clearance, shelter support, traffic management and restoration of essential community services.
 - (6) **Industry and Critical Infrastructure Operators**. Including industrial facilities, energy installations, refineries, transport networks, ports, storage terminals, industrial estates and SEZs responsible for on-site preparedness, emergency response arrangements, business continuity and regulatory compliance.

- (7) **Academia, Non-Governmental Organization (NGOs), International Non-Governmental Organization (INGOs) and Community Organizations.** Support research, risk awareness, training, volunteer mobilization, community resilience, humanitarian assistance and public outreach initiatives.

3. **NDMA Mandate under NDM Act, 2010.** Under National Disaster Management Act, 2010, NDMA serves as the apex federal coordination authority for disaster management in Pakistan. In industrial and technical disasters, NDMA's role remains strategic, coordinative, facilitative and supportive, while operational command at incident sites remains with provincial and district authorities unless otherwise directed by the Federal Government. NDMA's major functions include:-



a. **National Planning and Policy Coordination**

- (1) Prepare long term National Disaster Management Plans, Annual National Disaster Response Plans, industrial contingency frameworks.
- (2) Coordinate implementation of national disaster management policies.
- (3) Develop national guidelines, SOPs, standards, preparedness protocols.
- (4) Harmonize federal and provincial disaster management mechanisms.
- (5) Integrate industrial risk reduction into national planning frameworks.

b. **Coordination and Response**

- (1) Coordinate federal response during threatening disaster situations or major industrial emergencies.
- (2) Mobilize specialized national capabilities and federal resources.
- (3) Coordinate inter-provincial support mechanisms.
- (4) Facilitate deployment of HazMat response assets, engineering support, urban search and rescue teams, medical surge support and logistics resources.
- (5) Coordinate international technical assistance and humanitarian support where required.

c. **Technical Assistance and Capacity Building**

- (1) Provide technical assistance to provincial and district authorities.
- (2) Promote industrial disaster awareness and preparedness.

- (3) Support hazard mapping, vulnerability assessment and industrial risk analysis.
- (4) Conduct national-level training, simulations and exercises.
- (5) Facilitate institutional strengthening and capability development.

d. **Information Management and Early Warning**

- (1) Support multi-hazard monitoring and industrial risk information systems.
- (2) Coordinate dissemination of early warnings and advisories.
- (3) Maintain centralized databases, lessons-learned systems and incident repositories.

4. **Federal-Provincial Interface.** NDMA Act, 2010 significantly enhanced provincial autonomy in sectors directly linked with industrial and technical disaster management including industries, labour, environment, health, local government, occupational safety, emergency services and municipal administration accordingly:-

- a. Provinces retain primary operational responsibility for disaster management within their jurisdictions.
- b. District administrations and DDMA function as first responders.
- c. PDMA act as second-tier coordinating authorities for provincial response management.
- d. NDMA functions primarily as a coordinating, facilitating, harmonizing and policy-guiding authority at national level.
- e. Federal intervention supplements provincial efforts without replacing provincial authority.
- f. Provincial industrial contingency plans shall remain aligned with national frameworks to ensure interoperability and coordinated response.
- g. This framework promotes cooperation through shared responsibilities, coordinated preparedness and unified national resilience.

5. **Provincial, District and Local Responsibilities**

a. **Provincial Disaster Management Authorities (PDMA).** PDMA are responsible for provincial-level industrial and technical disaster management and shall:-

- (1) Formulate provincial contingency plans and develop capabilities of rescue services for industrial and technical disasters.
- (2) Coordinate implementation of national and provincial disaster management policies.
- (3) Conduct provincial industrial hazard and vulnerability assessments.
- (4) Coordinate provincial emergency response operations.

- (5) Manage provincial stockpiles and specialized emergency resources.
 - (6) Coordinate with industrial departments, rescue agencies and district administrations.
 - (7) Disseminate warnings and advisories.
 - (8) Conduct industrial disaster simulations, exercises and awareness programs.
 - (9) Coordinate with NDMA for federal support and specialized assistance.
 - (10) Ensure communication operational readiness and coordination systems.
- b. **District Disaster Management Authorities (DDMAs).** DDMAs function as frontline response authorities and are responsible for:-
- (1) Preparation of district industrial emergency response plans.
 - (2) Hazardous facilities mapping identification and vulnerable populations.
 - (3) Coordination of evacuation, rescue support and public safety measures.
 - (4) Coordination with industries, rescue agencies, hospitals and law enforcement authorities.
 - (5) Dissemination of emergency warnings and public advisories.
 - (6) Identification of emergency shelters and relief centres.
 - (7) Traffic control and access management during emergencies.
 - (8) Local damage assessments and operational reporting.
 - (9) Conduct of local preparedness drills and awareness campaigns.
 - (10) Ensuring local implementation of national and provincial guidelines.
- c. **Tehsil and Local Governments.** Local governments support industrial disaster management through:-
- (1) Maintenance of essential municipal services.
 - (2) Emergency sanitation and water supply support.
 - (3) Temporary shelter and relief facilitation.
 - (4) Restoration of damaged civic infrastructure and utilities.
 - (5) Enforcement of land-use and local building regulations.
 - (6) Public awareness and community coordination.

6. **Industrial Risk Landscape and Regulatory Framework**

- a. Pakistan's industrial risk environment is influenced by rapid industrialization, movement and storage of hazardous materials, urban-industrial proximity, aging infrastructure in certain sectors and varying levels of regulatory compliance. Major industrial hazard exposures are associated with chemical industries, petroleum and gas installations, fertilizer plants, power generation

facilities, mining operations, transport corridors, refineries, storage terminals, ports, industrial estates and SEZs.

- b. National industrial regulatory framework is administered through federal and provincial authorities responsible for industrial safety, occupational health, environmental protection, hazardous materials management, transportation safety, mining regulation, energy sector oversight and infrastructure safety. Key stakeholders include Labour Departments, Environmental Protection Agencies (EPAs), Oil and Gas Regulatory Authority (OGRA), Mines and Minerals Departments, Transport Authorities, Building Control Authorities, Port and Aviation Authorities, Civil Defence Organizations and other sector-specific regulators.
- c. Relevant regulators and technical authorities shall support industrial risk management through inspections, compliance monitoring, licensing, safety audits, incident investigations, environmental assessments, enforcement actions and post-incident corrective measures.
- d. Industries handling hazardous materials or undertaking high-risk operations shall maintain:-
 - (1) On-site emergency response and contingency plans.
 - (2) Emergency shutdown, isolation and containment systems.
 - (3) Trained emergency response and safety management teams.
 - (4) Hazardous material inventories, safety data sheets and risk information systems.
 - (5) Adequate firefighting, spill containment and emergency response equipment.
 - (6) Coordination mechanisms with DDMA's, emergency services and relevant regulatory authorities.
 - (7) Periodic safety audits, inspections, emergency drills and business continuity arrangements.
- e. All industrial establishments shall comply with applicable national and provincial laws, regulations, standards and licensing requirements governing industrial safety, occupational health, environmental protection, hazardous materials management and emergency preparedness.

7. **National Industrial Hazard Profile**

- a. Pakistan's industrial risk profile includes five major hazard categories:-
 - (1) Fire Breakouts.
 - (2) Explosions.

- (3) Toxic e.g gas or liquid Releases.
- (4) Environmental Hazards.
- (5) Health Hazards.
- b. The assessment further highlighted risks associated with:-
 - (1) Petroleum and petrochemical industries.
 - (2) Chemical and fertilizer industries.
 - (3) Oil and gas fields and storage facilities.
 - (4) Hazardous material transportation.
 - (5) Energy and power generation systems.
 - (6) Heavy manufacturing industries.
 - (7) Mining and extractive operations.
 - (8) Ports, depots and industrial storage facilities.
- c. Industrial accidents arising from fires, explosions, structural failures, hazardous material releases and occupational safety incidents, while recognizing that industrial incidents may remain under-reported in certain sectors. Priority national industrial risk scenarios include:-
 - (1) Toxic gas releases near populated areas.
 - (2) Large-scale industrial fires and explosions.
 - (3) Pipeline ruptures affecting multiple districts.
 - (4) Hazardous material transportation accidents.
 - (5) Structural failures in industrial facilities.
 - (6) Mining collapses and underground incidents.
 - (7) Power plant and energy system failures.
 - (8) Large-scale environmental contamination incidents.

8. **Coordination Mechanisms and Command Architecture**

- a. **Incident Command System (ICS)**. A standardized ICS shall be adopted across all tiers to ensure interoperability, clear command structures, scalable response management and effective coordination during industrial emergencies.
- b. **Emergency Operations Centres (EOCs)**. National, provincial and district EOCs shall function as coordination hubs for preparedness, information sharing, resource coordination, warning dissemination and operational management during both disaster and non-disaster periods.
- c. **National Emergencies Operation Centre (NEOC)**. NEOC serves as an integrated ICT-enabled national coordination platform supporting industrial risk

monitoring, predictive analysis, early warning dissemination, operational coordination and strategic decision-making. NEOC functions include:-

- (1) Develop National/ Global Common Operating Pictures (NCOP/ GCOP).
 - (2) Real-time situational awareness and information fusion.
 - (3) Risk communication and public warning dissemination.
 - (4) Coordination with ministries, industries, technical agencies, armed forces, humanitarian partners and international stakeholders.
 - (5) Operational coordination of national-level response support.
- d. **Provincial Emergency Operation Centres (PEOCs)**. PEOCs shall replicate NEOC structures at provincial level to support coordination, monitoring, field operations, emergency communication and operational management.
- e. **Inter-Agency Coordination Forums**. Regular coordination forums shall be conducted among NDMA, PDMAs, industrial regulators, rescue agencies, Armed Forces, industries, NGOs, INGOs, UN agencies, academia and technical institutions to strengthen preparedness, interoperability and response coordination.

9. **Escalation and Federal Support Principles**

- a. Industrial and technical disasters may require escalation beyond district and provincial capacities due to the specialized nature of response requirements. The escalation framework shall be guided by:-
- (1) Subsidiarity and local primacy.
 - (2) Tiered escalation mechanisms.
 - (3) Unity of effort.
 - (4) Timely information sharing.
 - (5) Needs-based federal support.
 - (6) Respect for constitutional mandates.
- b. A three-tier response model shall apply:-
- (1) **Tier-1: Local Response**. Industry operators, rescue services, district administration, DDMA manage immediate containment and response.
 - (2) **Tier-2: Provincial Response**. PDMA coordinates expanded provincial response operations and mobilization of provincial capabilities.
 - (3) **Tier-3: National Support**. NDMA activates federal coordination, inter-provincial support and international facilitation where required.
- c. Federal support may be activated when:-
- (1) Local and provincial capacities are exceeded.
 - (2) Incidents involve mass casualties or large off-site impacts.

- (3) Critical national infrastructure is threatened.
- (4) Multi-provincial implications exist.
- (5) Burn care, engineering, or environmental capabilities are required.
- (6) International assistance becomes necessary.

10. **Legal and Policy Enablers.** To strengthen implementation of this Plan, the following policy enablers shall be institutionalized:-

- a. **Legal Anchoring and Harmonization.** Provincial contingency plans and industrial emergency frameworks shall remain aligned with national disaster management policies and standards.
- b. **Build Back Better (BBB) and Industrial Resilience.** Recovery and reconstruction shall incorporate resilient infrastructure standards, industrial safety improvements, environmental safeguards, risk-informed development principles.
- c. **Disaster Risk Financing.** Contingency financing, climate finance, insurance mechanisms, anticipatory financing and emergency funding systems shall be promoted to strengthen preparedness and operational readiness.
- d. **Mandatory After-Action Reviews (AARs).** Structured AARs, lessons-learned exercises and operational evaluations shall be conducted following major industrial incidents.
- e. **National Industrial Incident Repository.** NDMA shall maintain centralized national databases for industrial incidents, hazard information, international best practices, lessons learned and operational best practices.
- f. **Transparency and Accountability.** Transparent reporting, compliance monitoring, operational audits and evidence-based corrective mechanisms shall be institutionalized across all tiers.
- g. This legal, institutional and governance framework establishes the basis for coordinated preparedness, interoperability, accountability, resilience-building and effective management of industrial and technical disasters across Pakistan.

CHAPTER - 3

NATIONAL INDUSTRIAL RISK LANDSCAPE

1. **Purpose of the Chapter.** Chapter provides a comprehensive overview of Pakistan's industrial and technical risk environment, identifies major high-risk sectors and geographic concentrations and outlines the national industrial risk profile relevant to contingency planning, preparedness, response coordination and capability development. Chapter supports risk-informed planning and prioritization of preparedness investments by identifying major industrial hazard zones, vulnerable populations, critical infrastructure dependencies and emerging technological risks associated with Pakistan's expanding industrial footprint.

2. **Overview of Pakistan's Industrial Landscape**

- a. Pakistan's industrial and technical landscape has expanded significantly over the past two decades due to rapid urbanization, industrial growth, energy demand, infrastructure development, transport expansion, mining activities and establishment of SEZs. Major industrial sectors include chemical and petrochemical industries, oil and gas infrastructure, power generation and transmission systems, mining and extractive industries, manufacturing and processing facilities, industrial estates, logistics hubs, ports, storage terminals and transport corridors handling hazardous materials.
- b. While these sectors are critical for economic growth and national development, they also generate significant industrial and technological risks capable of causing mass casualties, environmental degradation and disruption of essential services, infrastructure failures and long-term socioeconomic impacts. Industrial growth has increasingly brought hazardous facilities closer to densely populated urban areas, thereby increasing exposure and vulnerability of surrounding communities.



- c. Pakistan's industrial expansion, increasing hazardous material movement and limited industrial safety compliance in certain sectors have elevated the national industrial risk profile. Assessment further observed that industrial accidents involving fires, explosions, toxic releases, infrastructure failures and occupational safety incidents continue to pose significant risks to public safety and national resilience.

3. **Major Industrial Risk Sectors**

- a. **Chemical, Petrochemical and Hazardous Industrial Sectors.** Pakistan's chemical and petrochemical industry constitute one of the highest-risk sectors due to the handling, processing, storage and transportation of hazardous substances including chlorine, ammonia, petroleum products, acids, volatile chemicals and toxic compounds. Chemical plants, fertilizer industries, refineries, petrochemical installations, storage depots and industrial processing facilities remain vulnerable to toxic gas releases, industrial fires, explosions, chemical spills, corrosive exposure and long-term environmental contamination. Industrial incidents involving hazardous chemicals may rapidly escalate localized emergencies into large-scale disasters, particularly in urban-industrial interfaces and densely populated areas. Risks associated with petroleum infrastructure, fertilizer industries, oil and gas facilities, heavy manufacturing industries, industrial storage areas and hazardous industrial processes involving toxic, corrosive, flammable and reactive materials.
- b. **Energy, Power and Critical Infrastructure Risks.** Energy and power infrastructure also represent a major source of industrial risk. Power generation facilities, oil and gas installations, fuel depots, transmission systems and energy corridors involve combustible fuels, high-pressure systems, complex electrical networks and interconnected mechanical infrastructure. Technical failures in these systems may trigger large-scale fires, explosions, cascading infrastructure failures and prolonged disruption of essential national services affecting large populations and critical economic activities. Bulk fuel depots, gas storage facilities, industrial warehouses and chemical terminals further constitute high-consequence risk zones due to storage of large quantities of hazardous and flammable materials. Such facilities may generate high-intensity fires, toxic plume formation, environmental contamination and secondary impacts on nearby infrastructure and surrounding communities during emergencies.

- c. **Mining and Extractive Industry Risks.** Mining and extractive industries present significant risks including tunnel collapses, structural failures, underground explosions, gas accumulation, flooding, machinery accidents and delayed rescue operations due to difficult terrain and remote locations. The remoteness of many mining areas increases operational complexity and limits rapid access to emergency response resources and specialized rescue teams. These operational constraints may significantly delay life-saving interventions and increase casualty risks during industrial emergencies.
- d. **Hazardous Material Transportation and Logistics Risks.** Transport and logistics systems handling hazardous materials create moving industrial risk corridors across the country. Hazardous cargo transported through roads, railways, ports, airports and pipelines may result in toxic exposure, fires, explosions, environmental contamination, supply chain disruptions, traffic paralysis and public panic in case of accidents. Urban transport corridors carrying hazardous materials remain particularly vulnerable due to high population density and limited emergency evacuation capacity. Increasing industrial connectivity and fuel transportation requirements further elevate the complexity and frequency of hazardous material movement across national and provincial transport networks.



4. **Geographic Distribution of Industrial Risks**

- a. Industrial risk is unevenly distributed across Pakistan and remains concentrated around major industrial and economic zones including industrial estates, SEZs, port cities, coastal industrial hubs, oil and gas corridors, mining regions, urban-industrial clusters, energy generation systems and major logistics routes.

- b. High-risk areas are generally characterized by dense industrial concentration, heavy movement of hazardous materials, critical infrastructure dependencies, high population exposure and limited buffer zones between industrial facilities and residential settlements. Urban-industrial interfaces are particularly vulnerable where residential communities, schools, hospitals, commercial markets and public infrastructure exist in close proximity to hazardous industrial installations.
- c. Coastal industrial hubs face additional compound risks where industrial accidents may coincide with flooding, cyclones, maritime incidents, storm surges or port-related emergencies. Similarly, industrial corridors linked with ports, fuel depots, pipelines and transport terminals create interconnected risk zones capable, generating cascading impacts across multiple districts/ sectors.
- d. There is a need for geo-spatial mapping, industrial hazard zoning, vulnerability analysis and identification of industrial hotspots to support national-level preparedness planning and prioritization of emergency response resources.

5. **Hazardous Materials and Industrial Supply Chains**

- a. Pakistan's industrial economy depends heavily on continuous storage, processing, transportation and handling of hazardous materials including flammable liquids and gases, toxic industrial chemicals, corrosive substances, explosives, reactive compounds, petroleum products, industrial waste and hazardous by-products. These materials move through interconnected national supply chains linking ports, storage terminals, refineries, industrial estates, transport corridors, energy installations and major consumption centres.
- b. Disruptions or accidents involving hazardous materials may generate cascading impacts including environmental contamination, shortages of essential commodities, disruption of fuel supplies, interruption of industrial production, threats to public safety and economic losses affecting multiple sectors simultaneously. Effective contingency planning therefore requires national visibility of hazardous material flows, critical transport corridors, storage locations, industrial nodes and vulnerable population centres.
- c. Pakistan imports and transports significant quantities of hazardous chemicals and petrochemicals to support industrial and energy requirements. Risks therefore exist not only within industrial facilities but also during transportation, storage, transfer operations and movement through populated areas and national transport networks.

6. **Population Exposure and Vulnerability**

- a. Population vulnerability to industrial and technical disasters is influenced by settlement patterns, infrastructure limitations, industrial proximity, public awareness levels, socioeconomic conditions and access to emergency services. Major vulnerability drivers include residential encroachment near industrial facilities, informal settlements within industrial zones, weak enforcement of land-use regulations, limited evacuation routes in urban centres, occupational exposure of industrial workers and inadequate public awareness regarding industrial hazards.
- b. Industrial disasters may disproportionately affect vulnerable populations including children, elderly persons, persons with disabilities, low-income communities, industrial workers and marginalized groups due to limited mobility, reduced access to information and inadequate preparedness arrangements. Urban-industrial communities located near hazardous facilities remain particularly exposed to toxic releases, fires, explosions and environmental contamination.
- c. Risk-informed planning must therefore integrate community awareness programs, evacuation planning, public warning dissemination systems, industrial safety awareness, protection of vulnerable groups and community-level preparedness measures to reduce population exposure and strengthen resilience.

7. **Historical Trends and Emerging Risk Drivers**

- a. Past industrial incidents (in Pakistan and international) demonstrate recurring operational gaps including delayed incident detection and reporting, weak industrial safety compliance, inadequate on-site preparedness, poor coordination between industries and emergency responders, limited HazMat and specialized firefighting capabilities and weak public communication and evacuation arrangements.
- b. Industrial accidents in Pakistan includes fires, explosions, occupational safety failures, infrastructure collapse, toxic substance exposure and operational negligence. Available assessments and incident records further indicate under-reporting of industrial incidents in certain sectors, weaknesses in enforcement mechanisms and varying levels of compliance with industrial safety standards.
- c. Pakistan's industrial risk landscape continues to evolve due to rapid industrial expansion, increasing movement of hazardous materials, aging infrastructure in certain industrial sectors, climate-related stress on industrial systems,

increasing technological complexity and growing dependence on interconnected infrastructure systems. Climate-induced hazards including flooding, extreme heat, severe weather events and urban flooding may further intensify industrial vulnerabilities by damaging infrastructure, disrupting operations and increasing the likelihood of industrial accidents and hazardous releases.

8. **National Risk Prioritization and Strategic Implications**

- a. Based on sectoral exposure, population vulnerability, infrastructure concentration and operational complexity, priority national industrial risk areas include high-risk industrial zones near densely populated areas, hazardous material transport corridors, fuel depots and storage terminals, energy and petrochemical infrastructure, major ports and logistics hubs, mining regions with limited emergency access and critical infrastructure systems with cascading failure potential.
- b. National industrial risk profile highlights the urgent requirement for strengthened industrial safety compliance, improved environmental monitoring systems, enhanced public warning mechanisms, specialized HazMat and firefighting capabilities, better inter-agency coordination, strategic pre-positioning of emergency resources, standardized incident reporting systems and development of unified situational awareness platforms. Joint preparedness exercises, technical training programs, industrial safety audits and risk-informed contingency planning are essential to strengthen operational readiness and national resilience against industrial and technical disasters.
- c. This risk-informed approach enables prioritization of preparedness investments, capability development, industrial safety improvements, emergency planning and coordinated national response arrangements for industrial and technical disasters across Pakistan.

CHAPTER - 4

THREAT SCENARIOS & RISK PRIORITIZATION

1. Introduction

- a. Pakistan's rapidly expanding industrial base, increasing urbanization, concentration of hazardous industries near populated areas, growth of energy infrastructure and movement of hazardous materials across national transport corridors have significantly increased the likelihood and consequences of industrial and technological disasters. Industrial incidents may trigger localized emergencies, large-scale humanitarian crises, environmental degradation and disruption of critical infrastructure, economic losses and cross-provincial cascading impacts.
- b. Chapter identifies major industrial and technological threat scenarios relevant at national level and establishes a framework for national risk prioritization to support preparedness, contingency planning, operational coordination, capability development and response arrangements under this National Contingency Plan. Chapter adopts a scenario-based planning approach to assist Federal Ministries, NDMA, PDMA, DDMA, industrial regulators, emergency responders and critical infrastructure operators in planning for credible industrial and technological emergencies.



2. National Industrial Hazard Categories

- a. Based on national industrial risk assessments, industrial profiles, hazard mapping, historical incidents and expert consultations, several broad categories of industrial and technological hazards have been identified as priority national concerns. Fire hazards remain among the most frequent industrial risks and may involve petroleum storage facilities, chemical plants, LPG installations, textile industries, warehouses, industrial estates, power

generation facilities, port infrastructure and fuel transportation systems. Industrial fire incidents may result in mass casualties, toxic smoke release, secondary explosions, destruction of industrial infrastructure, urban fire spread, prolonged firefighting operations and disruption of critical services.

- b. Explosion hazards constitute another major category of industrial emergencies and may originate from LPG bottling plants, fertilizer industries, gas pipelines, chemical reactors, industrial pressure vessels, explosives manufacturing facilities and fuel storage depots. Such incidents may generate blast waves, structural collapse, secondary fires, toxic releases, widespread panic and severe infrastructure damage.
- c. Toxic and hazardous material releases may occur during industrial processing, transportation accidents, storage failures, tanker incidents, chemical leakages, pipeline ruptures or improper disposal of industrial waste. These incidents may create public health emergencies, air and water contamination, long-term environmental degradation and large-scale evacuation requirements.
- d. Environmental emergencies linked with industrial activity may include industrial effluent discharge, oil spills, hazardous waste contamination, coastal pollution, industrial runoff, air pollution events and contamination of rivers and water systems. Such incidents may severely affect drinking water systems, fisheries, agriculture, ecosystems, public health and livelihoods.
- e. Technological and infrastructure failures also represent emerging industrial risks and may result from power grid collapse, industrial automation malfunction, industrial cyber disruption, damaged control systems, failure of safety mechanisms or collapse of critical infrastructure. Such failures may generate cascading disruptions across interconnected sectors including transportation, communication, energy, health services, industrial operations.

3. **Industrial Fire, Explosion and Hazardous Material Emergencies**

- a. A number of industrial and technological threat scenarios have been identified as priority national-level emergencies requiring coordinated preparedness, specialized capabilities and integrated response arrangements. A major industrial fire occurring within a densely populated industrial estate or urban-industrial interface may rapidly spread across multiple facilities and surrounding settlements. Such incidents may result in mass casualties, collapse of local emergency services, urban evacuation, air quality emergencies, destruction of industrial assets and prolonged firefighting operations. High-risk industrial clusters include Karachi industrial zones,

Lahore industrial areas, Faisalabad industrial clusters, SITE industrial estates and port-adjacent industrial facilities.

- b. Major toxic release from chemical storage facilities, industrial processing plants, transportation systems or hazardous material depots may expose nearby populations and infrastructure to dangerous substances. Such incidents may result in toxic inhalation, mass exposure, long-term health consequences, water contamination, large-scale evacuation and multi-district public health emergencies. Explosion or fire at an oil refinery, fuel terminal or large storage depot may severely affect national energy supply chains and surrounding communities. Potential impacts include secondary explosions, critical infrastructure damage, prolonged industrial fires, environmental contamination, disruption of fuel distribution systems and economic losses.
- c. Hazardous material transportation incidents may occur during road, rail, maritime, pipeline or air transportation of dangerous goods. Such incidents may result in fires, explosions, toxic releases, environmental contamination, transport disruption, river pollution, highway closures and cross-jurisdictional response requirements. Urban transport corridors handling hazardous cargo remain particularly vulnerable due to high population density/ traffic congestion.

4. **Compound Disasters and Port - Related Emergencies**

- a. Natural hazards including floods, earthquakes, cyclones, landslides and severe weather events may also trigger secondary industrial disasters. Examples include refinery fires following earthquakes, chemical leakage during flooding, damaged gas infrastructure, industrial contamination during cyclones and hazardous releases caused by structural failure. Such compound emergencies represent a major national disaster risk due to simultaneous pressure on emergency response systems and critical infrastructure.
- b. Industrial incidents occurring at ports and coastal terminals may involve hazardous cargo fires, oil spills, chemical leakage, fuel terminal explosions and maritime hazardous material emergencies. Such incidents may disrupt national trade, damage marine ecosystems, contaminate coastal areas and require international coordination support. Pakistan's major ports and coastal industrial infrastructure therefore remain highly sensitive to both industrial and climate-induced emergencies.

5. **Critical Infrastructure and Cascading System Failures.** Critical infrastructure failures including power system collapse, communication disruption, industrial control system malfunction, cyber-enabled industrial emergencies and major pipeline failures may further

create cascading national-level consequences affecting transportation systems, hospitals, emergency coordination mechanisms, industrial operations and public services. Failures within interconnected infrastructure systems may significantly disrupt governance functions, emergency response coordination, economic activities and continuity of essential national services, thereby increasing the complexity and duration of industrial and technical disaster response operations.

6. **Cascading and Compound Risks**

- a. Industrial and technological disasters frequently generate cascading and compound impacts across interconnected infrastructure systems and economic sectors. Single industrial emergency may trigger multiple secondary emergencies that significantly increase operational complexity and overwhelm local response capacities. Examples include explosions causing urban fire spread, toxic releases contaminating water systems, industrial fires disrupting power infrastructure, oil spills affecting fisheries and livelihoods or earthquakes simultaneously triggering refinery fires and chemical leakage.
- b. Compound emergencies involving multiple hazards may require provincial, federal or international assistance due to the scale of operational requirements, technical complexity and cross-sector impacts. Accordingly, all response agencies shall incorporate cascading risk considerations into contingency planning, simulation exercises, resource mobilization arrangements and emergency coordination frameworks.

7. **Risk Mapping and Impact Zoning**

- a. NDMA, in coordination with Federal Ministries, PDMAs, regulators, industrial operators and technical agencies, shall support national and provincial industrial hazard mapping initiatives to improve preparedness and operational planning. Risk mapping may include industrial hazard zones, population exposure mapping, toxic dispersion modelling, fire and blast impact zones, hazardous material transportation corridors, environmental sensitivity mapping and critical infrastructure exposure analysis.
- b. For operational planning purposes, industrial emergencies may broadly be divided into three operational zones based on the level of risk and response requirements. The innermost zone represents the immediate danger area with severe life-threatening hazards requiring specialized protective measures. The intermediate zone serves as the controlled operational area where response activities are conducted under prescribed safety restrictions. The outermost zone constitutes safe support and coordination area used for command,

logistics, staging, resource management and other operational support functions. The extent of these zones may vary depending on the nature of hazard, meteorological conditions, terrain, industrial processes involved and population density.

8. **National Risk Prioritization Criteria**

- a. For national preparedness and response planning, industrial risks shall be prioritized based on factors including potential loss of life, population exposure, hazard severity, environmental consequences, critical infrastructure impact, economic disruption, cross-provincial implications and operational complexity. Particular emphasis shall be placed on incidents capable of causing mass casualties, widespread toxic exposure, long-term environmental damage, disruption of energy systems, transportation paralysis, interruption of water supply, communication breakdown and major economic losses.
- b. Risks requiring specialized HazMat response, technical rescue, environmental management, military support, or inter-provincial coordination shall receive higher national preparedness priority due to the complexity and scale of operational response requirements.

9. **Scenario-Based Planning Approach**

- a. National Contingency Plan adopts a scenario-based planning methodology to improve operational preparedness, capability assessment, inter-agency coordination and emergency response management. Scenario-based planning supports resource estimation, evacuation planning, capability development, public safety planning, exercise design and coordination among federal, provincial, district, industrial and humanitarian stakeholders.
- b. Federal Ministries, PDMAs, DDMA's, industrial operators, emergency responders and critical infrastructure operators are encouraged to develop detailed provincial and local threat scenarios based on industrial profiles, hazard exposure, population density, critical infrastructure dependencies, historical incidents, emerging technological risks and environmental vulnerabilities. Such planning approaches strengthen operational readiness and support evidence-based preparedness investments.

10. **Strategic Considerations**

- a. Pakistan's industrial and technological risk profile is expected to continue evolving due to expansion of industrial estates, growth of SEZs, increasing energy demand, urban-industrial expansion, rising hazardous material

transportation, technological dependency, automation and climate-induced industrial vulnerabilities.

- b. Accordingly, industrial and technological risk assessment shall remain a continuous national priority requiring periodic review, multi-sectoral coordination, strengthened industrial safety compliance, integration of emerging technological risks and incorporation of industrial risk reduction measures into national disaster management and development planning frameworks. Continuous investment in preparedness, specialized capabilities, environmental monitoring, public warning systems, industrial safety standards and operational coordination mechanisms will remain essential to strengthen Pakistan's resilience against industrial and technical disasters.

CHAPTER - 5

PREPAREDNESS, PREVENTION & RISK REDUCTION

1. **Introduction.** Preparedness, prevention and risk reduction are fundamental pillars of industrial and technological disaster management. Effective implementation of preventive and preparedness measures significantly reduces likelihood of industrial incidents and minimizes human, environmental, operational and economic consequences. Chapter outlines national framework for strengthening industrial safety preparedness, reducing industrial risk exposure, enhancing regulatory readiness, improving coordination mechanisms and promoting risk-informed industrial development across Pakistan. It provides strategic guidance to Federal Ministries, Provincial Governments, PDMAs, DDMA, industrial regulators, industrial operators, emergency services and critical infrastructure agencies for coordinated implementation of industrial disaster risk reduction measures.
2. **Strategic Objectives.** Strategic objectives of preparedness, prevention and risk reduction measures under this Plan are to reduce likelihood of industrial and technological disasters; minimize exposure of populations, infrastructure and environment to industrial hazards; strengthen industrial emergency preparedness capacities at all levels; improve early identification, monitoring and reporting of industrial risks; enhance coordination between regulatory, response and industrial stakeholders; promote safe industrial growth and risk-informed development planning; and strengthen national resilience against industrial and technological emergencies.
3. **Industrial Safety and Emergency Preparedness**
 - a. Industrial operators shall establish and maintain industrial safety systems proportional to the nature and scale of hazards associated with their facilities. Industries handling hazardous materials should periodically undertake the process of safety assessments, fire risk assessments and environmental risk assessments to identify operational vulnerabilities and strengthen preventive measures. Industrial facilities should also establish internal safety management systems addressing process safety, occupational safety, hazardous material handling, permit-to-work systems, equipment maintenance, incident reporting, safety audits and emergency shutdown procedures.
 - b. Industries shall maintain appropriate safety infrastructure including fire suppression systems, detection and alarm systems, gas monitoring arrangements, spill containment mechanisms, emergency isolation systems, ventilation systems, backup power systems and protective equipment. In addition, critical industrial equipment including pressure vessels, boilers, pipelines, storage tanks, electrical systems and fire protection systems shall

undergo periodic inspection, testing and maintenance in accordance with applicable standards and regulatory requirements.

- c. Industries handling hazardous materials or high-risk industrial processes shall further develop and maintain On-Site Emergency Plans defining emergency organizational structures, incident command arrangements, alarm and notification procedures, evacuation mechanisms, firefighting arrangements, hazardous material response procedures, emergency shutdown systems, medical response arrangements and coordination procedures with local authorities. Such plans should be periodically reviewed, tested through drills, updated following operational changes and integrated with district-level contingency arrangements where appropriate.



4. Off-Site Preparedness and Community Safety

- a. PDMAs, DDMAAs, local administrations, emergency services and industrial regulators shall support the development of Off-Site Emergency Arrangements for high-risk industrial zones. Off-site preparedness measures may include public warning systems, evacuation planning, traffic management plans, shelter arrangements, medical surge planning, hazard communication procedures, public information mechanisms and mutual aid coordination arrangements. Special attention should be given to densely populated industrial areas, industrial estates, ports, refineries, SEZs and hazardous material transportation corridors.
- b. Communities residing near hazardous industrial facilities are often the first affected during industrial emergencies; therefore, public awareness and community preparedness remain essential components of industrial risk reduction. Relevant authorities and industrial operators should support public awareness campaigns, hazard communication initiatives, community safety

education, evacuation awareness programs, public reporting mechanisms, school safety awareness and community emergency drills. Awareness materials should be prepared in local languages and adapted according to local hazard profiles and community vulnerabilities.



5. Early Warning, Monitoring and Hazardous Material Management

- a. Relevant agencies shall strengthen systems for early detection, monitoring, reporting and warning of industrial hazards. Monitoring mechanisms may include gas detection systems, environmental monitoring systems, industrial surveillance systems, remote sensing technologies, industrial telemetry systems, pipeline monitoring systems, fire detection systems and weather and atmospheric monitoring systems. Early warning arrangements should support rapid hazard detection, timely reporting, public warning dissemination, implementation of protective actions and inter-agency coordination during industrial emergencies.
- b. Special arrangements shall also be maintained for safe handling, storage, movement and disposal of hazardous materials. Hazardous material safety management measures may include hazard classification systems, Material Safety Data Sheets (MSDS), hazard labelling systems, storage segregation arrangements, safe loading and unloading procedures, spill control measures, transportation safety protocols and disposal procedures. Regulation of hazardous materials responsible authorities shall coordinate with emergency response agencies to strengthen preparedness/ response capacities.

6. Critical Infrastructure Protection and Regulatory Readiness

- a. Protection of critical infrastructure is essential for ensuring continuity of national functions during industrial and technological emergencies. Critical infrastructure requiring protection may include energy infrastructure, oil and gas facilities, ports and terminals, communication systems, water supply

systems, hospitals, transportation networks and industrial control systems. Risk reduction measures may include redundancy systems, physical security arrangements, fire protection systems, cybersecurity measures, backup communication systems, protective zoning and access control systems.

- b. Relevant Federal and Provincial authorities shall promote enforcement of industrial safety, environmental protection, occupational safety and hazardous material regulations. Regulatory preparedness measures may include safety inspections, licensing systems, compliance audits, enforcement mechanisms, safety certification systems, environmental monitoring and emergency preparedness reviews. Coordination among regulatory bodies should be strengthened to avoid duplication and improve industrial oversight and compliance monitoring.

7. **Risk-Informed Development and Industrial Zone Preparedness**

- a. Industrial and urban development planning shall incorporate industrial risk considerations to reduce exposure and vulnerability. Relevant authorities should promote industrial zoning regulations, buffer zone requirements, land-use planning controls, environmental impact assessments, strategic environmental assessments, population exposure reduction measures and safe site selection criteria. Development planning should discourage establishment of hazardous industries near densely populated settlements, schools, hospitals, environmentally sensitive areas and critical infrastructure.
- b. Industrial Estates and SEZs shall develop coordinated emergency preparedness mechanisms appropriate to their hazard profiles. Preparedness measures may include estate-level emergency plans, shared firefighting resources, common warning systems, mutual aid arrangements, joint emergency drills, centralized emergency coordination mechanisms and common hazardous material management systems. Relevant authorities should encourage integrated industrial safety frameworks in industrial clusters.

8. **Capacity Building, Data Management and Coordination**

- a. Federal Ministries, PDMAs, DDMA's, industrial operators, emergency services and regulators shall promote capacity building for industrial emergency management. Capacity development measures may include specialized industrial safety training, HazMat response training, fire and rescue training, environmental emergency management training, joint simulation exercises, technical workshops and academic and research collaboration. Technical

institutions and professional organizations may also be engaged to strengthen national industrial safety expertise.

- b. Authorities should support development of centralized industrial risk information systems for industrial geo-tagging, hazard mapping, incident reporting, resource inventory, risk monitoring, exposure and vulnerability analysis. Data sharing protocols between relevant stakeholders should be strengthened to improve situational awareness and planning capacities.
- c. Preparedness and prevention of industrial disasters require coordinated efforts between Federal Ministries, Provincial Governments, PDMAs/ DDMAAs, industrial regulators, emergency services, industrial operators, environmental agencies, academia, civil society and private sector stakeholders. NDMA may facilitate strategic coordination and harmonization of national industrial disaster risk reduction initiatives.

9. **Strategic Considerations.** Pakistan's industrial and technological risk environment continues to evolve due to rapid industrialization, increasing hazardous material movement, urban-industrial expansion, energy infrastructure growth and climate-related stressors. Preparedness and prevention measures shall therefore remain dynamic, risk-informed and continuously updated to address emerging industrial and technological risks. Strengthening preparedness and prevention capacities at national, provincial, district and industrial levels remain essential for reducing disaster losses, protecting communities, safeguarding the environment and ensuring sustainable industrial development.

CHAPTER - 6

COMMAND, CONTROL & COORDINATION MECHANISM

1. **Introduction.** Effective management of industrial and technological disasters requires a clear command structure, coordinated decision-making, efficient information flow and rapid multi-agency response arrangements. Industrial emergencies frequently involve multiple stakeholders including Federal Ministries, Provincial Governments, emergency services, industrial operators, regulators, Armed Forces, humanitarian agencies and technical response organizations. Chapter establishes national framework for command, control, coordination, information management and operational activation during industrial and technological emergencies to ensure unity of effort, coordinated decision-making, efficient resource utilization, timely information sharing and scalable response management.

2. **Guiding Principles for Coordination and Response.** Command and coordination arrangements under this Plan shall be guided by key principles, including a tiered response approach, whereby incidents are managed initially at the lowest appropriate level, with escalation to higher levels when local capacities are exceeded. Coordination mechanisms shall promote a unified approach to prevent duplication of effort and conflicting actions, whilst maintaining a clear command structure with defined roles and responsibilities throughout all phases of the response. Timely and accurate information sharing amongst stakeholders, interoperability through compatible procedures and communication systems and the flexibility and scalability to adapt coordination structures according to the nature, scale and complexity of an incident shall remain central to all response operations.



3. **National Coordination Framework and ICS**

- a. Industrial and technological emergencies may require coordination at district, provincial or national levels depending on the scale of the incident, hazard type, population exposure, resource requirements and geographic spread. National coordination framework under this Plan shall involve NDMA, PDMAs, DDMA's, Federal Ministries, Provincial Departments, emergency services, Armed Forces, law enforcement agencies, industrial regulators, industrial operators and technical agencies.

- b. ICS shall serve as primary operational framework for management of industrial and technological emergencies by providing standardized command arrangements, scalable coordination structures and integrated incident management. ICS structure may include an Incident Commander supported by Operations, Planning, Logistics and Finance and Administration Sections, along with Safety, Liaison and Public Information functions. Scale and structure of ICS shall remain proportional to the nature and complexity of the incident.
4. **Role of District Administration and DDMA.** District Administration and DDMA shall serve as first tier of coordinated civil response during industrial emergencies within district jurisdiction. Their responsibilities include initial coordination, evacuation management, public warning, resource mobilization, local emergency response and coordination among district stakeholders. DDMA may coordinate with rescue and fire services, police, health authorities, municipal authorities, environmental agencies and industrial operators. Where incidents exceed district capacity, support requested from Province and PDMA.
5. **Role of Provincial Governments and PDMA.** PDMA shall coordinate provincial-level support during industrial and technological emergencies, including inter-district coordination, provincial resource mobilization, specialized response coordination, public information management and support to affected districts. Provincial Governments may activate relevant departments including Home, Health, Environment, Industries, Transport, Irrigation and Civil Defence departments. PDMA may also facilitate mutual aid arrangements, technical assistance and overall provincial emergency coordination.
6. **Role of NDMA and National-Level Coordination.** NDMA shall perform national-level coordination functions during major industrial and technological emergencies requiring federal support, inter-provincial coordination and national resource mobilization. Responsibilities include strategic coordination, federal resource mobilization, inter-provincial coordination, international coordination, information consolidation, national situational awareness and support to Provincial Governments. NDMA may coordinate with Federal Ministries, Armed Forces, national emergency response agencies, international humanitarian partners and specialized technical organizations and may support national-level consequence management during catastrophic incidents.
7. **Multi-Agency Coordination and Role of Industrial Operators**
- a. Industrial emergencies frequently require simultaneous involvement of multiple specialized agencies including fire and rescue services, HazMat response teams, health and medical authorities, environmental agencies, law enforcement, industrial regulators, utility providers, transport and port authorities, Armed Forces and Civil Defence organizations. Unified

coordination arrangements shall therefore be promoted to ensure common operational priorities, coordinated action planning, efficient resource allocation and integrated public messaging.

- b. Industrial operators shall remain responsible for immediate on-site emergency management within their facilities. They shall activate internal emergency plans, initiate immediate response measures, notify relevant authorities, provide technical information, support hazard assessment and facilitate responding agencies. Operators should maintain close liaison with district authorities, emergency services, regulators and nearby communities.

8. **Emergency Operations Centres and Information Management**

- a. EOCs may be activated at district, provincial and national levels to support / coordination, information management, resource tracking, operational planning, communication and decision-making. EOCs may operate at DDMA, PDMA, NDMA, or facility-specific levels depending on the scale of incident. Key functions include situation reporting, resource coordination, incident tracking, public information coordination, inter-agency communication and operational support.
- b. Timely and accurate information management is critical during industrial emergencies. Agencies shall establish procedures for incident notification, operational reporting, hazard assessment, casualty reporting, resource tracking and situational analysis. Information management systems should support operational decision-making, public safety, coordination and strategic planning, with standardized reporting formats.

9. **Public Information, Warning and Escalation Procedures**

- a. Timely dissemination of public information is essential to reduce panic, support protective actions and ensure public safety. Authorities may issue emergency warnings, evacuation instructions, shelter guidance, health advisories and safety updates. Communication must remain accurate, timely, coordinated and consistent, utilizing electronic media, mobile alerts, siren systems, social media, local administration channels and community networks.
- b. Industrial incidents may escalate rapidly, requiring higher-level coordination and resource mobilization. Escalation may be considered when local capacity is exceeded, multiple districts are affected, specialized resources are required, population exposure is extensive, critical infrastructure is threatened, or national implications emerge. Activation levels may include local, provincial and national activation, with detailed procedures outlined in operational annexures.

10. **Coordination with Armed Forces and International Partners**

- a. Subject to Government authorization, Armed Forces may provide support during major industrial emergencies, including specialized response capabilities, aviation support, engineering assistance, evacuation, logistics, communication and technical support. Civil-military coordination shall be facilitated through established national coordination mechanisms.
- b. In large-scale emergencies requiring international assistance, Government of Pakistan may coordinate through appropriate federal channels. International support may include technical expertise, environmental response support, hazardous material management assistance, humanitarian aid and specialized equipment. NDMA may facilitate coordination with international partners in accordance with Government policy and established national procedures.

11. **Continuity of Coordination and Strategic Considerations**

- a. Authorities shall ensure continuity of coordination through backup communication systems, alternate coordination locations, redundant information systems and continuity planning measures to maintain critical functions during prolonged or complex emergencies.
- b. Industrial and technological emergencies are becoming increasingly complex due to urban-industrial expansion, interconnected infrastructure systems, hazardous material movement and emerging technological dependencies. Effective command, control and coordination therefore require regular exercises, interoperable systems, institutional coordination and continuous capacity enhancement. Strengthening integrated coordination arrangements at all levels remains essential for ensuring timely, organized and effective management of industrial and technological emergencies in Pakistan.

CHAPTER - 7

NATIONAL RESPONSE OPERATIONS FRAMEWORK

1. Overview

- a. Industrial and technological disasters require rapid, coordinated and realistic response arrangements aligned with operational capacities available at district, provincial and national levels. Due to technical nature of industrial emergencies, response operations may simultaneously involve firefighting, hazardous material containment, evacuation, medical response, environmental protection, infrastructure restoration and public safety management.
- b. Chapter outlines the national operational response framework for industrial and technological emergencies in Pakistan based on a tiered response concept and existing national response capacities. The framework emphasizes practical coordination, scalable response mechanisms, efficient resource utilization and phased escalation of support arrangements.

2. **Tiered National Response Framework.** Industrial emergencies shall be managed through a tiered response mechanism based on scale, complexity and consequences of the incident.



- a. **Tier-1: Local/ District Response.** Minor and localized industrial incidents shall primarily be managed at district level through industrial facility response teams, district administration, Rescue services, local fire services, police, health authorities and municipal agencies. Most industrial incidents are expected to be managed within this operational tier.
- b. **Tier-2: Provincial Response.** Where district resources are insufficient, Provincial Governments and PDMAs may coordinate inter-district support, specialized rescue assets, provincial firefighting support, environmental response measures, medical surge support, provincial resource mobilization.
- c. **Tier-3: National/ Federal Support.** Federal support may be requested for catastrophic industrial disasters, multi-provincial incidents, strategic infrastructure emergencies, large-scale hazardous material incidents, or

emergencies requiring national capabilities. National-level support may include NDMA coordination, Armed Forces assistance, aviation support, logistics and federal technical coordination.

3. **Initial Response and Incident Stabilization**

- a. First operational priority during industrial emergencies shall be protection of life and stabilization of incident. Initial response actions may include incident notification, activation of emergency plans, establishment of incident command, hazard identification, perimeter control, evacuation or shelter-in-place decisions, firefighting, rescue operations and emergency medical support.
- b. Industrial operators shall immediately notify relevant authorities upon occurrence of major incidents involving fire, explosion, toxic release, structural collapse, or hazardous material leakage.

4. **Fire and Rescue Operations**

- a. Fire and rescue operations during industrial incidents shall primarily be conducted by local fire services, Rescue services, industrial firefighting teams, Civil Defence and other designated responders. Operational priorities may include life rescue, containment of fire spread, cooling operations, protection of surrounding infrastructure and prevention of secondary explosions.
- b. Industrial facilities handling hazardous materials should maintain internal firefighting capability, emergency water systems, foam systems and fire suppression equipment. Large-scale industrial fires may require mutual aid support, provincial reinforcement, or Armed Forces assistance.

5. **Hazardous Materials (HazMat) Response**

- a. Pakistan currently possesses limited dedicated HazMat response capability; therefore, hazardous material response arrangements under this Plan shall remain realistic and scalable. Initial HazMat response priorities may include identification of hazardous substances, isolation of affected areas, containment of leakage, responders protection, implementation of public safety measures.
- b. Specialized technical response may be coordinated through industrial operators, EPAs, Civil Defence, Rescue services and technical agencies. During major hazardous material incidents, operational emphasis shall focus on containment, evacuation, exposure reduction and consequence management. Development of specialized HazMat capacities shall remain a progressive national objective.

6. **Medical Response, Evacuation and Public Safety**

- a. Health response during industrial emergencies shall be coordinated by relevant health authorities in coordination with district administration and emergency responders. Medical response priorities may include triage, stabilization, emergency treatment, decontamination support, casualty evacuation and hospital surge management. Public health concerns may include toxic inhalation, chemical burns, contaminated water exposure, smoke inhalation and long-term environmental health impacts. Hospitals located near high-risk industrial zones should maintain basic preparedness for burn casualties, chemical exposure incidents and mass casualty emergencies.
- b. Evacuation decisions shall be based on hazard type, wind direction, toxic dispersion patterns, fire spread, blast risk and population exposure. District Administration and law enforcement agencies may coordinate evacuation routes, traffic management, perimeter control, public warning and temporary shelter arrangements. Where evacuation is not feasible, shelter-in-place measures may be implemented. Special attention should be given to schools, hospitals, vulnerable populations and densely populated settlements located near industrial facilities.

7. **Environmental Emergency Response.** Environmental protection measures shall be integrated into industrial response operations wherever feasible. Environmental response priorities may include spill containment, prevention of river contamination, air quality monitoring, hazardous waste isolation and environmental impact assessment. Relevant environmental agencies may support technical assessment, contamination monitoring, environmental advisories and remediation planning. Large-scale environmental emergencies may require coordinated federal and provincial support mechanisms.

8. **Logistics, Resource Mobilization and Mutual Aid**

- a. Logistics support during industrial emergencies may include firefighting equipment, rescue equipment, ambulances, protective equipment, medical supplies, transportation support, temporary shelter arrangements and fuel supply management. Districts shall utilize locally available resources as first priority, while industries, industrial estates, DDMA's and Provincial Governments shall maintain primary operational responsibility for emergency response resources within their respective jurisdictions.
- b. At federal level, NDMA presently does not maintain dedicated industrial firefighting resources, specialized rescue equipment, ambulances, industrial HazMat capability or operational protective equipment for direct deployment

during industrial emergencies. Accordingly, PDMAs, DDMAAs, industrial operators, industrial estates and local response agencies shall primarily rely on their own operational resources, mutual aid arrangements and provincial support mechanisms for immediate response operations.

- c. Where local and provincial capacities are exhausted or overwhelmed, NDMA may facilitate strategic support including medical supplies, transportation assistance, temporary shelter arrangements, relief support, fuel supply coordination, strategic logistics facilitation and inter-provincial resource coordination, subject to the scale and nature of emergency. Due to existing national resource constraints, operational emphasis shall remain on rapid mobilization, inter-agency coordination, realistic planning assumptions and strengthening provincial and district-level response capacities.
- d. Industrial emergencies frequently require simultaneous support from multiple agencies. Mutual aid arrangements may include neighbouring district support, industrial estate support systems, shared firefighting resources, provincial emergency reinforcement and technical assistance arrangements. Industrial operators are encouraged to establish voluntary mutual support arrangements within industrial clusters and industrial estates to improve collective emergency response capacity.

9. **Public Information During Response.** Public communication during industrial emergencies shall aim to reduce panic, provide protective instructions, counter misinformation and support public safety. Official information may include evacuation instructions, hazard warnings, road closure information, health advisories and safety updates. Public messaging should remain centralized, coordinated and factual to ensure consistency and public confidence during emergencies.

10. **Operational Challenges and Limitations.** Following operational limitations may affect industrial emergency response capacities in Pakistan:-

- a. Limited specialized HazMat capability.
- b. Inadequate industrial firefighting resources.
- c. Insufficient protective equipment.
- d. Limited environmental response capability.
- e. Urban congestion.
- f. Weak industrial compliance culture and limited district-level technical expertise.
- g. Accordingly, response planning under this Plan shall remain practical, scalable and resource-sensitive.

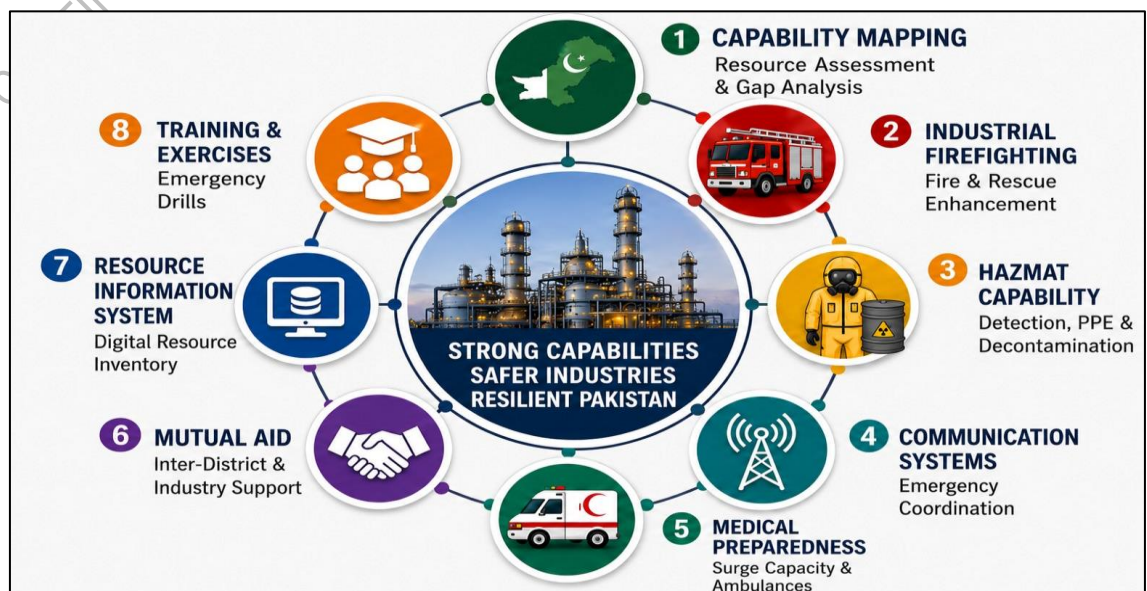
11. **Strategic Operational Priorities.** National operational approach shall prioritize:-
- a. Protection of life.
 - b. Incident stabilization.
 - c. Public safety.
 - d. Prevention of escalation.
 - e. Protection of critical infrastructure.
 - f. Environmental protection where feasible.
 - g. Rapid restoration of essential services.
 - h. Strengthening district/ provincial operational response capacities shall remain primary focus of future capability development initiatives under this Plan.

CHAPTER - 8

CAPABILITY DEVELOPMENT & STRATEGIC RESOURCES

1. Overview

- a. Effective management of industrial and technological disasters requires sustained development of provincial, district, institutional and industrial response capacities. Industrial emergencies often involve specialized operational requirements including hazardous material management, industrial firefighting, technical rescue, environmental monitoring, mass casualty management and coordinated multi-agency operations.
- b. Pakistan's current industrial emergency management capabilities remain uneven across regions and sectors. While some industrial facilities maintain internal response arrangements, district and provincial capacities for managing large-scale industrial emergencies remain limited in many areas. Dedicated industrial firefighting systems, specialized HazMat response resources, technical rescue equipment, environmental monitoring capability, emergency communication systems and protective equipment remain insufficient across several districts and industrial zones.
- c. Accordingly, primary operational preparedness and resource maintenance responsibilities shall remain with Provincial Governments, PDMAs, DDMAs, district emergency services, municipal authorities, industrial operators and industrial estates based on their respective jurisdictions and operational mandates. This chapter outlines the framework for capability development, strategic resource management, technical preparedness, operational readiness enhancement and phased strengthening of industrial and technological disaster management capacities in Pakistan.



2. **Capability Development Objectives**

- a. Capability development framework under this Plan aims to strengthen provincial and district industrial emergency response capacities, improve local preparedness for industrial incidents, enhance specialized response capabilities for hazardous industrial emergencies, promote coordinated resource planning and mutual support arrangements, improve operational readiness of relevant agencies, support development of sustainable and scalable response systems and encourage risk-informed investment in industrial emergency preparedness.
- b. Capability enhancement efforts under this Plan shall remain realistic, scalable and aligned with existing institutional capacities and resource availability. Emphasis shall be placed on strengthening provincial, district, industrial and mutual aid response arrangements rather than dependence upon centralized operational systems.

3. **National Capability Mapping and Readiness Assessment**

- a. Relevant authorities shall support periodic mapping and assessment of available industrial emergency response capabilities across the country. Capability mapping may include firefighting resources, rescue assets, ambulance and medical resources, HazMat response capability, environmental response resources, technical experts, industrial emergency equipment, specialized laboratories, aviation support and strategic logistics resources.
- b. Capability mapping should support response planning, resource gap identification, operational coordination and readiness assessment. Relevant authorities should also conduct periodic readiness assessments to evaluate operational capability, equipment availability, staffing levels, communication systems, training status and response preparedness at facility, district and provincial levels. Gap analysis should identify critical shortages, operational weaknesses, infrastructure limitations and priority investment areas requiring capability enhancement.
- c. Particular attention should be given to identified districts and industrial zones with limited operational capability, weak firefighting arrangements, insufficient rescue assets, limited medical surge capacity and inadequate hazardous material preparedness.

4. **District and Provincial Operational Capacities**

- a. District-level response remains the foundation of industrial emergency management in Pakistan. District capacities may include rescue services,

municipal fire services, civil defence, police, health services, local administration and industrial response teams. However, capability levels vary significantly across districts and many districts presently possess limited industrial firefighting capability, technical rescue resources, protective equipment, emergency communication systems and hazardous material response capacity.

- b. Priority areas for district capability enhancement may include industrial firefighting capacity, industrial rescue capability, emergency communication systems, evacuation management and ICS arrangements. High-risk industrial districts, major urban-industrial centres, energy infrastructure zones, industrial estates, ports and hazardous material transportation corridors should receive priority consideration for capability enhancement initiatives.
- c. Provincial Governments and PDMAs should progressively strengthen operational readiness through coordinated planning, specialized training, inter-district support mechanisms and development of scalable emergency response systems. Provincial resource planning should focus on practical and sustainable capability enhancement aligned with local hazard profiles, industrial exposure and operational realities.
- d. PDMAs, DDMAAs, district authorities, municipal emergency services, industrial operators and industrial estates shall maintain primary responsibility for development, maintenance and operational readiness of emergency response capacities within their respective jurisdictions and facilities.

5. **Specialized Response Assets and HazMat Capability Development**

- a. Certain industrial emergencies require specialized technical response resources beyond routine district capacities. Specialized assets may include industrial firefighting systems, foam tenders, breathing apparatus, gas detection systems, decontamination equipment, spill containment systems, technical rescue equipment and mobile command units. Currently, such specialized resources remain limited and concentrated within selected industrial facilities and major urban centres. Development of specialized capabilities should therefore follow a phased and risk-prioritized approach.
- b. Dedicated HazMat response capability in Pakistan remains limited and fragmented. Accordingly, gradual development of practical HazMat management capacity shall remain a priority for Provincial Governments, emergency services and industrial operators. Priority areas for capability enhancement may include HazMat awareness training, personal protective

equipment, basic decontamination capability, hazardous material identification systems, containment equipment and technical coordination mechanisms.

- c. Operational emphasis should initially focus on responder safety, isolation, containment and consequence reduction rather than highly advanced intervention capabilities that may not be operationally sustainable under existing conditions. Industrial operators handling hazardous materials are encouraged to maintain internal technical response arrangements proportional to their risk profile and hazard exposure.
- d. Provincial Governments, industrial estates and major industrial operators should progressively develop practical specialized response capabilities according to local industrial hazards and operational requirements.

6. **Strategic Resource Positioning and Emergency Stocks**

- a. Relevant authorities should encourage strategic positioning of emergency resources in proximity to high-risk industrial zones, ports, oil and gas infrastructure, industrial estates, SEZs and hazardous material transportation corridors. Strategic resource positioning may include firefighting resources, rescue equipment, medical support assets, spill response equipment, communication systems and emergency coordination facilities. Resource positioning should consider population exposure, industrial density, transportation access, operational accessibility and hazard profiles.
- b. Provincial Governments, PDMAs, DDMAAs, municipal authorities, industrial estates and industrial operators should progressively maintain emergency operational resources according to local hazard exposure, industrial density and operational requirements. Such resources may include firefighting systems, rescue equipment, protective equipment, emergency communication systems, ambulances, spill response equipment, fuel reserves and emergency logistics arrangements.
- c. Industries handling hazardous materials and high-risk industrial processes shall maintain internal emergency response arrangements proportional to their operational hazards and risk exposure. Industrial estates and major industrial clusters are encouraged to establish shared emergency support arrangements and coordinated operational resource systems where feasible.
- d. Strategic emergency reserves maintained by authorities may include emergency medical supplies, communication equipment, temporary shelter support items, fuel reserves, transportation support arrangements and emergency logistics assistance. However, operational planning under this Plan

shall remain primarily dependent upon district, provincial, industrial and mutual aid capacities rather than centralized national response resources.

- e. Where local and provincial resources are exhausted or overwhelmed during major emergencies, inter-provincial coordination, mutual aid support and strategic logistics facilitation may be coordinated through appropriate national mechanisms subject to operational availability and Government direction.

7. **Mutual Aid and Private Sector Participation**

- a. Mutual aid arrangements provide an important mechanism for enhancing emergency response capability without unnecessary duplication of resources. Mutual aid may involve neighbouring districts, industrial estates, industrial operators, emergency services and provincial authorities. Such arrangements may support firefighting reinforcement, technical expertise, rescue support, equipment sharing and logistics support. Industrial clusters and industrial estates are encouraged to establish coordinated mutual support arrangements for emergency response.
- b. Industrial operators and private sector stakeholders remain important contributors to industrial emergency preparedness and response. Private sector contributions may include internal emergency response capability, firefighting resources, technical expertise, logistics support, communication systems and mutual aid arrangements. Relevant authorities should encourage collaborative public-private preparedness initiatives for high-risk industrial sectors.
- c. As public-sector operational resources remain limited in several areas, industrial operators and industrial estates should progressively strengthen self-reliance, coordinated preparedness arrangements and internal emergency response capability proportional to their hazard exposure and operational risks.

8. **Technical Expertise, Resource Information Systems and Coordination**

- a. Industrial emergencies often require technical assessment and specialized scientific support. Technical expertise may be required for hazardous material identification, toxic exposure assessment, environmental monitoring, structural assessment, industrial process analysis and contamination management. Relevant authorities may coordinate with technical institutions, universities, professional bodies, industrial experts and scientific organizations to strengthen technical support mechanisms.
- b. Relevant agencies should maintain updated inventories of emergency response resources available within their jurisdictions. Resource inventories

may include equipment, vehicles, technical specialists, hospitals, laboratories, firefighting systems and emergency communication assets. Digital resource inventory systems should be encouraged where feasible to improve situational awareness, resource mobilization and operational coordination.

- c. Inter-agency coordination and resource information sharing shall remain essential for efficient mobilization of limited operational capacities during major industrial emergencies.

9. **Capability Development Priorities**

- a. Considering existing resource limitations, capability development efforts under this Plan should prioritize:-
 - (1) District-level operational preparedness.
 - (2) Industrial firefighting enhancement.
 - (3) Basic HazMat capability development.
 - (4) ICS implementation.
 - (5) Emergency communication improvement.
 - (6) Medical surge preparedness.
 - (7) Inter-agency coordination mechanisms.
 - (8) Industrial emergency exercises and training.
- b. Priority attention should be given to high-risk industrial districts, energy infrastructure zones, major ports, industrial estates and hazardous material transportation corridors.
- c. Operational capability enhancement should focus on practical and sustainable systems that can realistically be maintained and operated by Provincial Governments, district authorities, industrial operators and emergency services under prevailing resource conditions.

10. **Sustainability and Progressive Development**

- a. Capability enhancement for industrial disaster management shall follow a progressive and sustainable approach aligned with national priorities, available resources, institutional capacities and risk exposure. Relevant authorities should promote phased development, inter-agency cooperation, resource optimization and long-term institutional strengthening.
- b. Pakistan's industrial and technological risk environment is expected to increase in complexity due to industrial expansion, urbanization, energy infrastructure development, increasing hazardous material movement and emerging technological dependencies. Accordingly, strengthening practical and coordinated provincial, district, industrial and institutional response capabilities

remain essential for reducing industrial disaster risk and improving national preparedness. Long-term success will depend upon institutional coordination, sustained investment, realistic planning assumptions and enhancement of operational capacities at provincial, district, industrial and institutional levels.

NATIONAL CONTINGENCY PLAN FOR INDUSTRIAL AND TECHNICAL DISASTERS - 2026

CHAPTER - 9

RECOVERY, REHABILITATION & ENVIRONMENTAL MANAGEMENT

1. Overview

- a. Industrial and technological disasters may generate long-term humanitarian, environmental, economic and infrastructure consequences extending far beyond the immediate response phase. Recovery operations following industrial emergencies often involve restoration of critical services, environmental remediation, industrial rehabilitation, public health management, livelihood recovery and institutional review.
- b. Chapter outlines national framework for recovery, rehabilitation, environmental management and post-incident improvement following industrial and technological disasters in Pakistan. Framework promotes a coordinated and phased recovery approach aligned with scale of incident, environmental consequences, public safety requirements, available institutional capacities.
- c. Recovery planning under this Plan shall remain practical, scalable and aligned with prevailing institutional and resource capacities at district and provincial levels. Primary responsibility for local recovery, restoration, rehabilitation and environmental management shall remain with Provincial Governments, district authorities, relevant departments, utility providers, industrial operators and local service agencies.

2. Recovery Objectives

- a. Objectives of recovery and rehabilitation under this Plan are to restore essential services and public safety, minimize long-term environmental and socio-economic impacts, support recovery of affected communities and infrastructure, facilitate safe restoration of industrial operations where appropriate, conduct post-incident assessment and lessons learned analysis and strengthen future resilience through corrective actions and institutional improvements.
- b. Recovery operations should prioritize life safety, environmental protection, restoration of critical public services, stabilization of affected communities and reduction of future industrial risk exposure.

3. Early Recovery Coordination

- a. Early recovery activities may commence simultaneously with response operations where operationally feasible. Early recovery priorities may include restoration of access routes, debris clearance, stabilization of damaged areas, restoration of utilities, temporary shelter support and continuity of essential

public services. District Administration and Provincial Authorities shall coordinate early recovery activities in collaboration with relevant departments, industrial operators, utility providers and service agencies.

- b. Recovery coordination mechanisms should remain practical, scalable and proportionate to the scale and consequences of the incident. Where required during large-scale emergencies, coordination support and facilitation of federal assistance may be undertaken through appropriate national mechanisms subject to operational requirements and Government direction.

4. **Environmental Assessment and Remediation**

- a. Industrial emergencies may result in significant environmental contamination affecting air quality, rivers and water bodies, agricultural land, ecosystems and public health. Environmental assessment may therefore be required following toxic releases, chemical spills, oil spills, hazardous waste incidents and large industrial fires.

- b. Relevant environmental authorities may support contamination assessment, environmental monitoring, hazard evaluation and remediation planning. Environmental remediation measures may include containment of pollutants,



removal of contaminated materials, soil treatment, water quality restoration, hazardous waste disposal and environmental rehabilitation. Environmental restoration activities shall prioritize protection of public health, drinking water systems, agriculture and ecologically sensitive areas.

- c. Provincial EPAs, district authorities, industrial operators, municipal services and relevant technical departments shall maintain primary responsibility for environmental management and remediation activities within affected areas. Industrial operators responsible for hazardous releases should support environmental containment, remediation, restoration and safe waste management in accordance with applicable laws and regulatory requirements.

5. **Public Health Monitoring and Community Recovery**

- a. Certain industrial emergencies may create long-term public health concerns requiring continued monitoring and support. Potential health impacts may

include toxic exposure, respiratory illness, chemical contamination, burns, psychological stress and occupational exposure impacts. Health authorities may coordinate exposure monitoring, medical follow-up, public health advisories and health surveillance measures where required. Special attention may be required for vulnerable populations, emergency responders, nearby communities and industrial workers.

- b. Industrial disasters may also affect livelihoods, housing, employment, local businesses and community infrastructure. Relevant authorities may coordinate temporary relief support, rehabilitation assistance, restoration of local services and livelihood recovery support where feasible. Special consideration should be given to displaced populations, vulnerable groups and severely affected communities. Community engagement should be encouraged during recovery planning and rehabilitation processes.

6. **Restoration of Critical Services and Industrial Recovery**

- a. Restoration of essential public services remains a key recovery priority following industrial emergencies. Relevant authorities and service providers may coordinate restoration of electricity supply, water systems, transportation routes, communication systems, health services and municipal services. Priority should be given to restoration of services critical for life safety, emergency operations, hospitals and affected communities.
- b. Industrial disasters may significantly disrupt industrial production, supply chains, transportation systems and economic activities. Industrial operators may undertake phased restoration of operations following safety assessment, structural evaluation, environmental clearance and regulatory review where applicable. Relevant authorities should encourage safe recovery procedures, continuity planning, infrastructure rehabilitation and corrective safety measures before resumption of operations. Reactivation of damaged industrial facilities should not compromise public safety or environmental protection.
- c. Industrial operators shall maintain primary responsibility for restoration and rehabilitation of affected industrial facilities, operational continuity planning and implementation of corrective safety measures within their respective facilities.

7. **Waste Management and Debris Clearance**

- a. Industrial disasters may generate hazardous debris and contaminated waste requiring controlled handling and disposal. Waste management measures may include segregation of hazardous materials, safe transportation, temporary storage, decontamination and environmentally safe disposal. Relevant authorities should coordinate with environmental agencies, municipal services, industrial operators and technical experts where required. Improper disposal of hazardous waste following industrial incidents should be strictly avoided.
- b. Municipal authorities, Provincial EPAs, district administrations and industrial operators should coordinate debris clearance and hazardous waste management activities according to environmental safety requirements and operational priorities.

8. **Post-Incident Investigation and Lessons Learned**

- a. Major industrial and technological incidents should be subjected to post-incident review and investigation to identify root causes, operational failures, safety gaps, coordination issues and lessons learned. Investigations may involve relevant regulators, technical experts, industrial operators, law enforcement agencies and concerned authorities. Post-incident investigations should support corrective action, policy improvement, accountability and future risk reduction.
- b. Lessons identified from industrial emergencies should be documented and integrated into planning, training, preparedness measures, regulatory frameworks and operational procedures. Corrective actions may include revision of emergency plans, infrastructure upgrades, enhanced inspections, safety improvements, training enhancement and improved coordination mechanisms. Relevant authorities are encouraged to institutionalize periodic review of major industrial incidents for continuous improvement.

9. **Recovery Coordination Mechanisms and Financial Considerations**

- a. Recovery operations may involve coordination among District Administration, PDMA, EPAs, Health Departments, Industries Departments, Municipal Authorities, utility providers and industrial operators. Recovery coordination mechanisms should remain practical, scalable and proportionate to incident consequences. Large-scale industrial disasters may require phased recovery planning and inter-agency coordination arrangements extending beyond the emergency response phase.

- b. Recovery and environmental restoration following industrial disasters may involve substantial financial and technical requirements. Relevant authorities may explore public sector support mechanisms, industrial operator responsibility, insurance arrangements, donor assistance and technical partnerships where appropriate. Priority should be given to life safety, environmental protection and restoration of essential services.
- c. As centralized national recovery resources remain limited, recovery planning should primarily rely upon provincial, district, industrial, municipal, utility-sector and mutual support capacities supported by phased coordination arrangements where necessary.

10. **Key Considerations**

- a. Industrial and technological disasters may generate long-term environmental and socio-economic consequences extending beyond immediate operational response capacities. Accordingly, recovery planning should emphasize environmental sustainability, resilience building, safe restoration, institutional learning and gradual strengthening of recovery coordination systems.
- b. Strengthening post-incident assessment, environmental management, industrial safety improvement and recovery coordination mechanisms remains essential for improving resilience against future industrial and technological emergencies in Pakistan. Long-term improvement shall depend upon institutional coordination, provincial and district preparedness, industrial responsibility, environmental compliance, realistic planning assumptions and sustained enhancement of local recovery capacities.

CHAPTER - 10

TRAINING, EXERCISES, MONITORING & PLAN MANAGEMENT

1. Overview

- a. Sustainable preparedness for industrial and technological disasters requires continuous training, practical exercises, institutional learning, monitoring and periodic review of contingency arrangements. Industrial emergency management capacities can only remain effective through regular testing of plans, improvement of coordination mechanisms and enhancement of operational readiness at all levels.
- b. Chapter outlines the national framework for training, simulation exercises, monitoring, evaluation and management of National Contingency Plan for Industrial & Technical Disasters. The chapter aims to promote operational readiness, institutional coordination, continuous improvement and long-term sustainability of industrial emergency preparedness arrangements.
- c. Preparedness and training arrangements under this Plan shall remain practical, scalable and aligned with prevailing operational capacities at provincial, district, industrial and institutional levels. Primary responsibility for operational preparedness, training implementation, exercises and maintenance of contingency arrangements shall remain with Provincial Governments, PDMAs, DDMA, district authorities, industrial operators, industrial estates, emergency services and relevant departments.

2. Objectives

- a. Objectives of this chapter are to strengthen preparedness and operational readiness of relevant stakeholders, improve coordination among response agencies and industrial operators, promote standardized industrial emergency management practices, test contingency arrangements through practical exercises and drills, monitor implementation of preparedness measures and facilitate continuous review and improvement of the Plan.
- b. Chapter further aims to encourage sustainable preparedness systems, institutional ownership, practical operational readiness, phased enhancement of industrial emergency management capacities across Pakistan.

3. National Training Framework

- a. Relevant Federal Ministries, Provincial Governments, PDMAs, DDMA, emergency services, industrial operators and regulatory authorities shall support development of industrial emergency management training programs. Training activities may include industrial emergency management, ICS, fire and

industrial rescue, hazardous material awareness, emergency communication, evacuation management, medical emergency response, environmental emergency management, EOC operations and risk communication.

- b. Training programs should remain practical, scalable and aligned with existing operational capacities. Priority should be given to personnel deployed in high-risk industrial districts, industrial estates, ports, energy corridors and hazardous material transportation routes.
- c. Provincial Governments, PDMAs, district authorities, emergency services and industrial operators shall maintain primary responsibility for organizing and implementing operational training programs according to local hazard exposure and resource availability.

4. **Specialized Capacity Building**

- a. Specialized training may be arranged for agencies involved in industrial firefighting, hazardous material management, environmental response, technical rescue and industrial safety regulation. Where feasible, specialized training may involve technical institutions, industrial experts, academia and international partners. Development of advanced specialized capacities should remain progressive and aligned with prevailing institutional and resource availability.
- b. As specialized industrial response capability remains limited in many areas, emphasis should initially focus on strengthening practical operational skills, responder safety, incident command arrangements, basic HazMat awareness, evacuation management, firefighting coordination and consequence management capacities.

5. **Community and Industrial Awareness Programs**

- a. Awareness and preparedness initiatives should also target local communities, industrial workers, transport operators, educational institutions and vulnerable populations residing near industrial facilities. Awareness activities may include public safety campaigns, evacuation awareness, basic emergency response guidance, hazard communication and emergency reporting procedures. Industrial operators are encouraged to conduct periodic awareness sessions for workers and surrounding communities where appropriate.
- b. Community awareness materials should remain simple, locally understandable, hazard-specific and aligned with local industrial risk profiles.

6. **Simulation Exercises and Drills**

- a. Simulation exercises and drills are essential for testing operational readiness, coordination mechanisms, communication systems and emergency procedures. Exercises may include Scenario based discussion exercises, communication exercises, evacuation drills, field simulation exercises and multi-agency industrial emergency exercises. Exercise objectives may include validation of emergency plans, testing of coordination arrangements, resource mobilization assessment and identification of operational gaps.
- b. High-risk industrial facilities are encouraged to conduct periodic on-site emergency drills in coordination with local authorities and emergency services.
- c. Provincial Governments, PDMAs, DDMAs, district administrations, industrial estates and industrial operators should progressively institutionalize periodic operational exercises according to local hazard exposure and available operational capacities.

7. **Multi-Agency Coordination Exercises**

- a. Provincial Governments, PDMAs, DDMAs and industrial stakeholders should promote periodic multi-agency exercises involving emergency services, district administration, police, health departments, environmental agencies, industrial operators and other relevant stakeholders. Such exercises should focus on inter-agency coordination, communication procedures, evacuation management, hazardous material response and command arrangements.
- b. Lessons identified during exercises should be documented and incorporated into future preparedness planning, operational procedures, coordination arrangements and training programs.

8. **Monitoring, Evaluation and Performance Indicators**

- a. Relevant authorities shall support periodic monitoring/ inspections of preparedness and implementation measures under this Plan. Monitoring mechanisms may include review of preparedness arrangements, training status, exercise conduct, equipment readiness, response capacity assessment and compliance with emergency planning requirements. Evaluation processes should aim to identify operational strengths, capability gaps, coordination challenges and priority improvement areas.
- b. Relevant agencies may develop measurable indicators to assess preparedness and operational readiness. Indicators may include number of trained personnel, frequency of drills and exercises, emergency equipment readiness, industrial emergency plan availability, response time performance

and inter-agency coordination effectiveness. Monitoring indicators should remain simple, practical and achievable.

- c. Monitoring and evaluation systems should support practical improvement of operational readiness rather than purely administrative compliance mechanisms.

9. **Documentation, Reporting and Continuous Improvement**

- a. Relevant stakeholders should maintain records of training activities, emergency drills, incident reviews, equipment inspections and preparedness assessments. Reporting mechanisms may support institutional learning, coordination improvement and periodic review of preparedness status. Standardized reporting formats may be developed through operational annexures and SOPs where required.
- b. Industrial and technological risks continue to evolve due to industrial expansion, urban growth, emerging technologies and increasing hazardous material movement. Accordingly, preparedness arrangements under this Plan shall remain subject to continuous improvement through lessons learned, post-incident reviews, exercise outcomes, stakeholder consultation and risk assessment updates. Corrective actions identified through monitoring and exercises should be progressively integrated into operational planning and preparedness arrangements.

10. **Plan Review and Provincial Contingency Planning**

- a. Plan shall remain a living document subject to periodic review and updating. Review of the Plan may be undertaken periodically, following major industrial incidents, after significant policy or institutional changes, or based on emerging national risk trends. NDMA, in coordination with relevant stakeholders, may facilitate periodic review and harmonization of the Plan.
- b. Provincial Governments, PDMA, DDMA, relevant agencies are encouraged to align provincial and local contingency arrangements with framework provided in this Plan. PDMA shall develop, maintain, periodically review and update Provincial Industrial & Technical Disaster Contingency Plans in accordance with the format and guidance provided at **Annexure 'A'**. District-level contingency arrangements and operational procedures should similarly be aligned with provincial frameworks and local hazard profiles.
- c. Provincial contingency plans should remain practical, operationally realistic, hazard-specific and aligned with available provincial and district response capacities.

11. **Operational Annexures and Supporting Documents**

- a. Detailed operational procedures, technical guidance and implementation tools may be maintained separately through annexures, SOPs, guidelines and departmental procedures. Supporting documents may include escalation matrices, contact directories, notification procedures, reporting formats, resource inventories, templates, hazard-specific SOPs, evacuation checklists.
- b. Operational annexures should remain practical, regularly updated and easily accessible to relevant stakeholders.

12. **Key Considerations**

- a. Sustained preparedness for industrial and technological disasters requires long-term institutional commitment, realistic planning and continuous capacity enhancement. Training, exercises, monitoring and periodic review mechanisms are essential for strengthening operational readiness, improving coordination, reducing disaster risk and enhancing resilience.
- b. Effectiveness of this Plan will ultimately depend upon institutional ownership, practical implementation, regular testing and continuous improvement at provincial, district, industrial and institutional levels. Sustainable preparedness shall require phased enhancement of local operational capacities, regular updating of contingency arrangements, realistic planning assumptions and strengthened coordination among all relevant stakeholders.

Conclusion

13. Pakistan's expanding industrial base, increasing hazardous material movement, growing energy infrastructure and rapid urbanization have significantly increased exposure to industrial and technical hazards. Effective management of these risks requires a coordinated, proactive and risk-informed national approach. National Contingency Plan establishes a unified framework for preparedness, prevention, response, stabilization and early recovery. It reinforces roles of District Administrations and Provincial Governments as primary responders while positioning NDMA as the national coordinating, facilitating and policy-guiding authority.

14. Effective implementation of this Plan will require sustained commitment to industrial safety, regulatory compliance, capacity development, inter-agency coordination, information sharing and regular training and exercises. Continuous review and incorporation of lessons learned will remain essential to address evolving industrial and technological risks. Through strengthened preparedness, coordinated response mechanisms and collective stakeholder engagement, Pakistan can enhance national resilience, safeguard lives and livelihoods, protect the environment and critical infrastructure and support safe and sustainable industrial development.

**SUGGESTED LAYOUT OF PROVINCIAL CONTINGENCY PLAN TO MANAGE
INDUSTRIAL & TECHNICAL DISASTER**

(To be adapted by Provinces as per local requirements and tiered response principles)

1. Introduction

- a. Purpose of the Plan (what it enables: preparedness, response, recovery coordination).
- b. Scope & Applicability (hazards/ jurisdictions/ covered facilities, transport corridors, ports/ terminals, storage sites).
- c. Plan Ownership & Activation Authority (who approves, who activates, who issues updates).

2. Legal & Institutional Basis

- a. Provincial/ Sectorial Mandate (laws, rules, notifications, SOPs, delegated powers).
- b. Linkages with National Framework (NDMA coordination/ escalation; inter-provincial support).
- c. Roles of Regulatory Bodies (industry regulation, environment, labour/ safety, mines, petroleum, transport, port authorities etc).

3. Provincial Industrial & Technical Risk Profile

- a. Industrial Overview (major sectors: chemical, petrochemical, fertilizers, power, mining, cement, pharmaceuticals, textiles, etc).
- b. Industrial Clusters & High-Risk Installations (SEZs, industrial estates, refineries, terminals, LPG/ Ammonia storage, explosive stores, mines, dams/ powerhouses if relevant).
- c. Hazardous Materials and Key Supply Chains (common chemicals, fuels, toxic gases and bulk storage).
- d. Exposure and Vulnerability (population density near clusters, schools / hospitals, critical infrastructure and water sources).
- e. Historical Incident Summary (last 5–10 years: key lessons and recurring gaps).

4. Hazard Identification & Risk Assessment

- a. Hazard Categories Covered.
 - (1) Chemical/ toxic release, gas leak.
 - (2) Fire/ explosion (industrial/ petrochemical).
 - (3) Structural collapse/ mechanical failure.
 - (4) Pipeline/ terminal/ storage incidents.
 - (5) Transport accidents (road/ rail/ port/ river/ air where applicable).

- b. Risk Assessment Method.
- c. Risk Mapping & Off-site Impact Modelling (as feasible).
- d. Priority Risk Scenarios (Top 10) (each with triggers, likely impacts and immediate actions).

5. **Institutional Framework & Responsibilities**

- a. PDMA/ Provincial Lead Department (overall coordination and multi-agency response).
- b. District Administration/ DDMA's (on-ground coordination, evacuation, public safety and local resources).
- c. Line Departments (Health, Home/ Police, Rescue, Fire Services, Environment, Industries, Labour, Transport, Communication & Works, Local Gov't and Irrigation, etc.)
- d. Industry & Site Management (on-site plan, reporting, initial containment, technical data sharing and liaison).
- e. Mutual Aid and Private Sector Support (industry mutual aid groups, contractors, heavy machinery and specialized technical teams).
- f. Coordination with NDMA/ Federal Entities (when escalated) (specialized assets, inter-provincial support and international facilitation).

6. **Command, Control & Coordination Arrangements**

a. **ICS Structure**

- (1) On-Scene Commander designation.
- (2) Incident Management Team roles (Operations, Planning, Logistics, Finance/ Admin, Safety, Liaison and PIO).

b. **Emergency Operations Centres (EOC)**

- (1) District EOC functions.
- (2) Provincial EOC functions.
- (3) Activation levels and staffing (minimum staff roster).

c. **Reporting & Information Flow**

- (1) Immediate notification chain (industry → district → PDMA → NDMA as required).
- (2) Situation Report (SITREP) cycle (first 12–24 hours and daily thereafter).
- (3) Standard formats to be used (attach templates in Annexes).

d. **Inter-agency Coordination Mechanisms**

- (1) Unified Command (when multi-jurisdiction/ agency).
- (2) Joint operations room/ coordination cell.
- (3) Liaison arrangements with industry technical focal persons.

7. **Tiered Response Mechanism & Escalation**

a. **Tier Definitions**

- (1) **Tier-1:** Industry/ Local on-site response.
- (2) **Tier-2:** District/ Provincial response (off-site impact/ multiple agencies).
- (3) **Tier-3:** National coordination (capacity exceeded/ inter-provincial/ international).

b. **Escalation Triggers (minimum criteria)**

- (1) Casualties' threshold/ mass casualty potential.
- (2) Off-site population at risk/ evacuation required.
- (3) Fire/ explosion risk to critical infrastructure.
- (4) Hazardous plume/ water contamination risk.
- (5) Resource shortfall (specialized HazMat, burn care, decontamination, etc.).
- (6) Multi-district/ cross-border/ inter-provincial implications.

c. **Decision Authority & Time Standards**

- (1) Who declares Tier-2 and Tier-3 request.
- (2) Target timelines (e.g., initial report within 30 minutes; written within 2 hours; SITREP within 12-24 hours).

8. **Resource Inventory & Capability Mapping**

a. Provincial Resource Inventory (minimum).

- (1) Firefighting (tenders, foam, breathing apparatus).
- (2) HazMat (suits, detectors, deacon units, containment booms).
- (3) Medical (ambulances, burn units, poison control, antidotes where applicable).
- (4) Search & rescue/ heavy rescue tools.
- (5) Evacuation transport, shelter arrangements, crowd management assets.

b. **Capability Gaps & Surge Plan**

- (1) What is missing, where to source from (other districts/ provinces, military, private)
- (2) Mutual aid agreements and call-out procedure.

c. **Logistics & Movement Plan.** Staging areas, routes, access control, heavy equipment movement, traffic plans.

9. **Preparedness, Prevention & Risk Reduction**

a. Regulatory Compliance & Safety Inspections (schedule, checklists, enforcement pathway).

- b. Community Awareness around Industrial Clusters (sirens/alerts, do's & don'ts, shelter-in-place vs evacuation).
- c. Early Warning/ Detection (gas monitoring, alarms, reporting hotlines and coordination with industry).
- d. Critical Infrastructure Protection Measures (water intakes, power feeders, hospitals and schools).

10. **Response Operations Plan**

- a. Immediate Life-Saving Priorities.
- b. **Public Safety Measures**
 - (1) Perimeter control, exclusion zones and traffic control.
 - (2) Shelter-in-place and evacuation decision guide.
 - (3) Assembly points/ temporary shelters.
- c. **Firefighting & HazMat Operations**
 - (1) Containment, isolation and decontamination.
 - (2) Safe approach, PPE standards and monitoring.
- d. **Medical Response**
 - (1) Triage, referral pathways and burn/ toxic exposure protocol.
 - (2) Hospital surge and patient tracking.
- e. Protection of Vulnerable Groups (schools, hospitals, elderly and disabled).
- f. Continuity of Essential Services (power/ gas shutoff coordination, water safety and telecom).

11. **Communication, Media & Public Information**

- a. Public Warning Messages (templates).
 - (1) Evacuate vs shelter-in-place.
 - (2) Water/ air safety advisories.
 - (3) Rumour control and misinformation handling.
- b. Internal Communications Plan.

12. **Environmental Protection, Damage Assessment & Recovery**

- a. **Environmental Monitoring & Containment**
 - (1) Air/ water/ soil sampling responsibilities.
 - (2) Waste handling and disposal coordination.
- b. Damage & Loss Assessment (industry + public infrastructure).
- c. **Recovery & Rehabilitation Framework**
 - (1) Restoration of services.
 - (2) Community support and compensation coordination (as per provincial policy).

d. **Post-Incident Review & Corrective Actions**

- (1) Investigation support.
- (2) Safety upgrades and enforcement actions.
- (3) Lessons learned integration.

13. **Training, Exercises & Capacity Building**

- a. Training Plan.
- b. **Exercise Schedule**
 - (1) Tabletop (quarterly/ biannual).
 - (2) Field drill (annual in high-risk districts).
- c. AAR & Improvement Plan (tracked responsibilities and deadlines).

14. **Monitoring, Review & Updating Mechanism**

- a. Plan Review Cycle (annual + after major incident/ exercise).
- b. Version Control & Distribution List (who holds updated copy).
- c. Compliance tracking (district plans, industry on-site plans and resource inventory updates).

16. **Suggested Annexures to be Prepared by all Relevant Stakeholders for their respective Contingency Plans.** Detail is as under:-

- a. Contact Directory (24/7).
- b. Incident Notification Report (INR) format.
- c. Emergency Needs Assessment (ENA) format.
- d. First 12–24 Hours SITREP format.
- e. Resource Inventory format.
- f. Escalation Decision Matrix.
- g. Public Warning Message Templates (Evacuate/ Shelter-in-Place/ Water Safety).
- h. Minimum District-Level Checklist (for DDMA's).
- i. Industry On-site Plan Minimum Checklist (for regulators/ district admin).
- j. Glossary & Abbreviations.

