

Joint UNEP/OCHA Environment Unit
Environmental Risk Identification
Floods/Cyclone Pakistan - 3 July 2007
TC-2007-000084-PAK

Disclaimer

This profile is not a conclusive list. Other risks may be possible from large infrastructure and industrial facilities that are not readily identifiable. The information sources used are public websites. All efforts are made to screen the websites for accuracy.

Objective:

The objective of the Environmental Risk Identification (ERI) is to alert the UN Country Team after the natural disaster to potential secondary risks posed by large infrastructure and industrial facilities containing hazardous materials located in the affected area. This information can be shared with competent local and national authorities as appropriate. Any actual secondary risk should be addressed at the earliest possible stage.

Event: The monsoon weather system over Indian Gujraat entered North Arabian Sea on 23rd June 2007. Cyclone Yemyin made landfall in Baluchistan province on Tuesday 26th June 2007, bringing rain, flooding and winds of up to 80mph (130 km/h). As of 29th June 2007, widespread rain affected in Baluchistan while isolated light rain have been reported in Sindh.

Summary of findings:

The following large infrastructure and industrial facilities may pose a risk:

Facility	Location	Hazardous Material	Hazard
Nuclear installations			
KANUPP Light-Water-Cooled, Graphite-Moderator Reactor (137 MWe)	Near Karachi	Nuclear fuel (unirradiated and spent fuel)	Radioactive
Oil and Gas infrastructure			
Oil Production Sites	Lower Indus basin: - Tegani block - Thal block - Than Beg block - Kirthar block	Gasoline, naphtha, hydrofluoric acid, propane, butane, ethylene, propylene, mercaptan, liquefied natural gas and other combustibles	Corrosive Flammable Toxic
Gas Production Sites	Lower Indus basin: - Sui field (665 Mmc/d) - Mari field (Sindh) (446 Mmc/d) - Sawan field (366 Mmc/d) - Bhit field (316 Mmc/d) - Zanzama field - Rehmat field	Gasoline, naphtha, hydrofluoric acid, propane, butane, ethylene, propylene, mercaptan, liquefied natural gas and other combustibles	Corrosive Flammable Toxic
Pipelines	- Sui Northern Gas Pipeline - Sui Southern Gas Pipeline - Oil pipeline from Bin Qasim Port into central and north Pakistan (White Oil Pipeline Project)	Natural gas, propane, butane, ethylene, ethane, methane, kerosene, crude petroleum, chlorine, hydrogen, etc	Inflammable Pressurized pipelines
Oil storage	- Karachi (principle port of entry for oil imports)	Petroleum hydrocarbons, hydrogen sulphide, metals, polychlorinated biphenyls (PCB), acids and alkalis,	Flammable, Toxic Corrosive

	- Port Mohammed Bin Qasim (fuel distribution market)	ethylene, propylene, mercaptan, benzene, liquefied natural gas and other combustibles	Spontaneously combustible
Refinery	- National Refinery in Korangi (62,050 bbl/d) - Pakistan Refinery Ltd. in Karachi (46,300 bbl/d)	Petroleum hydrocarbons, hydrogen sulphide, metals, polychlorinated biphenyls (PCB), acids and alkalis, ethylene, propylene, mercaptan, benzene, liquefied natural gas and other combustibles	Flammable, Toxic Corrosive Spontaneously combustible
Energy power stations			
Thermal (oil)	- Bin Qasim (575MW) - Korangi (220MW) - Guddu Plant (1650 MW)	- Ammonia (cooling) - Fuel oil	- Toxic gas - Flammable
Hydropower	Hubb river	-	Dam stability might be affected, dammed water, high voltage electricity
Agro/Food Industry			
Large cooling facilities (slaughterhouses, dairy products, fat, fish and meat, breweries, refrigerated warehouses, etc.)	<i>These facilities may be present in the affected area, but an exact location could not be specified</i>	Ammonia, freons and sulphur dioxide	Toxic gas Corrosive
Meat processing		Hexachlorobenzene	Liquid toxic/persistent
Dairy products		Chlorine dioxide	Liquid toxic/persistent
Sugar industry		Sulphur dioxide	Toxic gas
Chemical industry			
Fertilizer	<i>These facilities may be present in the affected area, but an exact location could not be specified</i>	Ammonia, nitric acid, nitric oxide, ammonium nitrate	Toxic Flammable Explosive
Textiles (dyes and manufacturing)		Benzene, naphthalene, acids, alkalis, chlorine, bromine, sodium nitrite, ammonia, sodium sulphide, metals, lye, dyes, solvents, formic acid	Flammable Toxic Corrosive Oxidizing
Pharmaceutical		Solvents	Flammable Toxic
Hazardous waste			
Combined effluent Treatment Plant	Korangi (Karachi)	Waste	Highly toxic
Public areas and services			
Hospitals	<i>Various</i>	Mercury, radioactive sources, solvents, compressed gases, infectious substances, oxygen, ethylene oxide and various solvents,	Toxic, Radioactive Flammable Infectious
Drinking water filtration plant		Chlorine, hypochlorite solutions, acid	Corrosive Toxic gas Oxidizing
Sewage treatment plant		Chlorine, hydrogen peroxide	Toxic Corrosive
Specific basic industry			
Paper industry	<i>These facilities may be present in the affected area, but an exact location could not be specified</i>	Chlorine, chlorine dioxide, sulphur dioxide, ammonia, bleaching agent, acrylamide	Toxic

Mining activities:		
Coal exploitation in the province of Baluchistan		
General risks of mining activities:		
Possible type of incident	Typical cause of accidents possibly aggravated by the floods	Potential effects
Tailings dam failure	Poor water management, overtopping, foundation failure, drainage failure, piping, erosion, earthquake	Loss of life, contamination of water supplies, destruction of aquatic habitat and loss of crops and contamination of farmland, threat to protected habitat and biodiversity and loss of livelihood
Failure of waste rock dump	Instability often related to presence of water (springs, poor dump drainage)	Loss of life, injuries, destruction of property, damage to ecosystems and farmland
Pipeline failure, e.g. tailings, leach solution	Inadequate maintenance, failure of equipment, physical damage to pipeline	Contamination of soil, water, effects on water users. May not be detected for some time.
Transport of chemicals to/from site	Inadequate transport procedures and equipment, unsafe packaging, high-risk transportation routes	Contamination of soil, water, effects on water users, aquatic ecosystem damage, threat to human health
Ground substance	Slope failure, breakthrough to surface	Loss of life, damage to property
Spills of chemicals at site, e.g. fuel tank rupture, reagent store damage	Poor maintenance, inadequate containment	Contamination of soil and water. Air pollution could have health effects
Fire	Poor design, unsafe practices in relation to flammable materials	Effects of air pollution on health, property damage
Atmospheric releases	Inadequate design, failure to follow procedures, inadequate maintenance	Community concern, possible health effects
Explosions (plant)	Inadequate design, failure to follow procedures, inadequate maintenance	Community concern, loss of life, destruction of property
Blasting and explosives accidents	Poor practice, unsafe storage and handling	Property damage, risk to life

The Joint UNEP/OCHA Environment Unit :

The Joint UNEP/OCHA Environment Unit is the United Nations mechanism to mobilize and coordinate the international response to environmental emergencies caused by natural disaster, technological accidents and complex emergencies.

<u>Information sources:</u>	
Infrastructure Risks	Source of information
Nuclear Facilities	<ul style="list-style-type: none"> • http://www.iaea.org/programmes/a2/index.html • http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm • http://www.iaea.org/worldatom/rrdb/ • http://www.grid.unep.ch/data/download/gnv181.gif • http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp
Large hydrodams.	<ul style="list-style-type: none"> • http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp
Large Chemical/Industrial Industries	<ul style="list-style-type: none"> • http://www.pops.int/documents/implementation/nips/submissions/default.htm • http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm

Gas/Oil: Refineries, Pipelines, explorations sites	<ul style="list-style-type: none"> • http://www.eia.doe.gov/emeu/cabs/index.html • http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp • http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html • http://www.gsp.gov.pk/resources/63.jpg
Mining activities	<ul style="list-style-type: none"> • http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp • http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp • http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf • http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php
Hazardous waste storage sites	<ul style="list-style-type: none"> • http://www.basel.int/natreporting/compilations.html
<ul style="list-style-type: none"> • Conseil pour la réduction des accidents industriels majeurs (CRAIM). <i>Risk Management Guide for Major Industrial Accidents intended for municipalities and industry</i>. 2002 Edition. • International Atomic Energy Agency (IAEA). <i>Manual for the classification and prioritisation of risks due to major accidents in process and related industries. Inter-agency Programme on the Assessment and Management for Health and Environmental Risks from Energy and other Complex Industrial Systems</i>. 1996. • UNEP Industry and Environment (IE). <i>Hazard Identification and evaluation in a local community. Technical report n°12</i>. 1998. • UNDAC <i>Field Handbook</i> • <i>Emergency Response guidebook 2004. A guidebook for first responders during the initial phase of a dangerous goods/hazardous materials incident</i>. • UNEP. <i>APELL for Mining. Guidance for the Mining industry in raising awareness and preparedness for emergencies at local level. Technical report N°41</i>. 2001 	

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Attachment: Notification Form