

Environment Issues In Valuation

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Topics

- ▶ Environment and valuation - differences between the market price and the negative value consequent on environmental impact
- ▶ Environmental issues of air pollution, water pollution, environmental factors and their effects, measures to restore the damage, cost to cure
- ▶ Outlines of environmental legislations: the Indian Forest Act, 1927, the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986
- ▶ Laws related to industrial health and safety

Think of it...

- ▶ A Property besides a grave yard?
- ▶ A factory emitting smoke? Or Chromium.
- ▶ Meat Factory? Leather tannery?
- ▶ Mobile company – are the airwaves a pollution?

In ALL cases, environment and pollution plays an import part on the actual value of the asset.
What are those?
What are the Law for those?

Environment Pollution

- ▶ Air pollution
 - ▶ CO, NOX, SOX, Particle, Lead, O3, Noise, Smoke etc.
- ▶ Water pollution
 - ▶ All chemicals, waste, particles, that makes it different to natural state.
 - ▶ Oils, blood, human and animal waste, ash etc

Air Pollution

- ▶ **Prevention & Control of Pollution Act 1981.**
 - ▶ Any solid, liquid or gas, (including noise),
 - ▶ Present in the atmosphere that
 - ▶ May or tend to be injurious to
 - ▶ All living being or property & environment.

How does those happen

- ▶ Mining, refinery, chemical factories, power plants, sewage
- ▶ Heating of homes by gas, laundry service, cooking
- ▶ DG set, automobiles, Trains, Marine, Air planes
- ▶ Cigarette smoking,
- ▶ Volatile organic compounds.

Primary Pollutants
Secondary Pollutants

Sources & Effects

Pollutant	How it is produced	Harm
CO	IC Engines, incomplete burning	Gets inside RBC and reduce oxygen absorption
NOX	Automobiles, oil burning	With water becomes Nitric Acid. All type of acid damage – metals, body, fabric
SOX	Automobiles, Power plants,	With water becomes H ₂ SO ₄ . all effects of acid on life and water.
Suspended Particle	Thermal Power plant, Construction, Agricultural burning,	Lungs disease, cancer, bronchitis, asthma,
O ₃	Sunlight. Positive gas	This absorbs harmful sun lights that cause cancer.
Photochemical Smog	NOX+HC+sunlight.	Health issues of lungs and skin. Visibility reduction.
Lead	Batteries, Lead refining plant	Cancer, brain illness
HC	Decay in bio mass	All human health issues.
Chromium	Tanneries, Plating	Cancer, Organ damage

Control of Pollutions

- ▶ Legal
 - ▶ Unleaded Petrol, BS6 automobiles and fuel,
 - ▶ Location restrictions.
 - ▶ Zones – “RED” lead can be only in RED zones with strict control measures.
 - ▶ Real time measurement of smoke stack and ETP.
 - ▶ Secure sites for disposal.
- ▶ Plant can be shut down for 1 year.
- ▶ Very severe penalties and fines.

Control of Pollution

- ▶ Absorption by liquids
 - ▶ Bad gases are passed through liquid bath and the harmful gases are absorbed.
 - ▶ Packed tower, spray tower, scrubber, plate tower
 - ▶ High surface area to absorb quickly and maximum amount

Pollutants	Absorbant
SOX	NaOH, MgO, CaCo ₃ , Ca(OH) ₂
NOX	NH ₄ HCO ₃ ; NH ₄ HSO ₄ , Ca(OH) ₂ , NaOH
H ₂ S	NaOH, KOH
NH ₃	H ₂ SO ₄ , HCL,

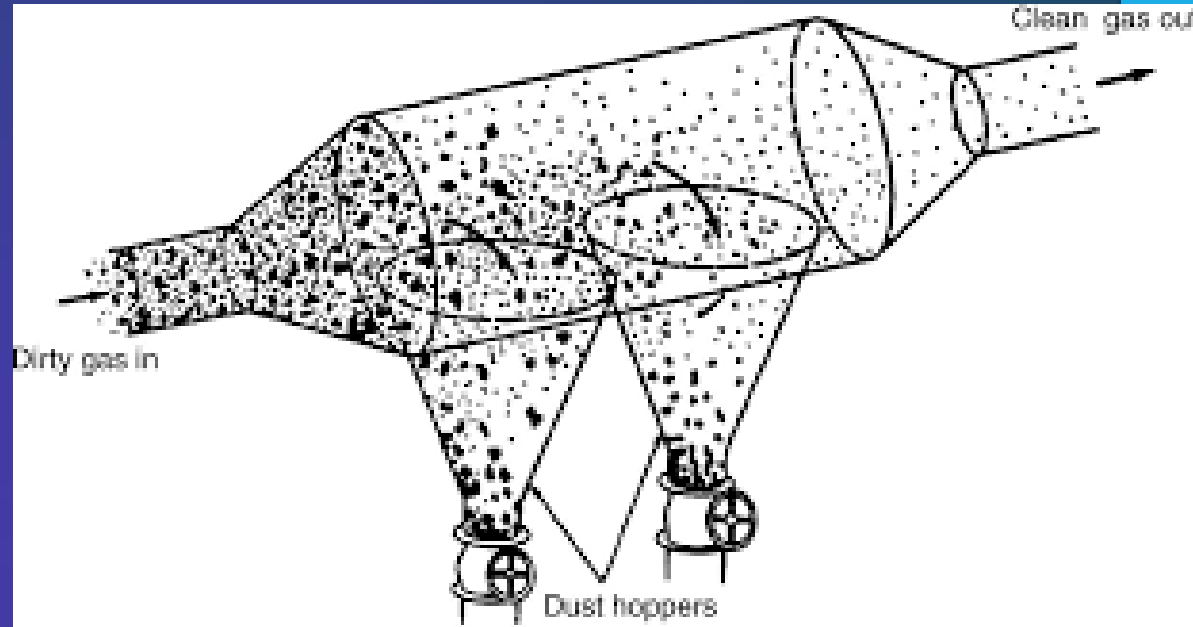
Control

- ▶ Absorption by solids
 - ▶ Gases are passed through columns of solids that absorb the pollutants

Solid Anti Pollutants	What is removes
Activated Carbon	Bad smell, trace impurities, HC
Activated Alumina / Silica	Dehydration / Acid removal
Silica Gel	Dehydration / Acid removal
Molecular Sleeve	These are catalysers and reacts with CO, NOX, SOX to convert to harmless gases. Mainly in automobiles.

Large scale pollution control

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Dust collectors

Advantage	Disadvantage	Used
Low Cost	Large particle size only	Lead Processing plant
Simple	Large space	Mining
Low maintenance		Power plants
Continuous		

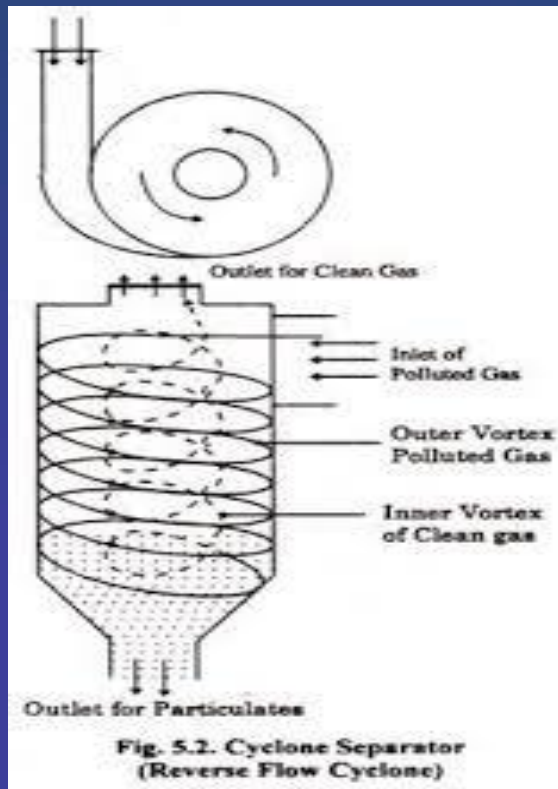
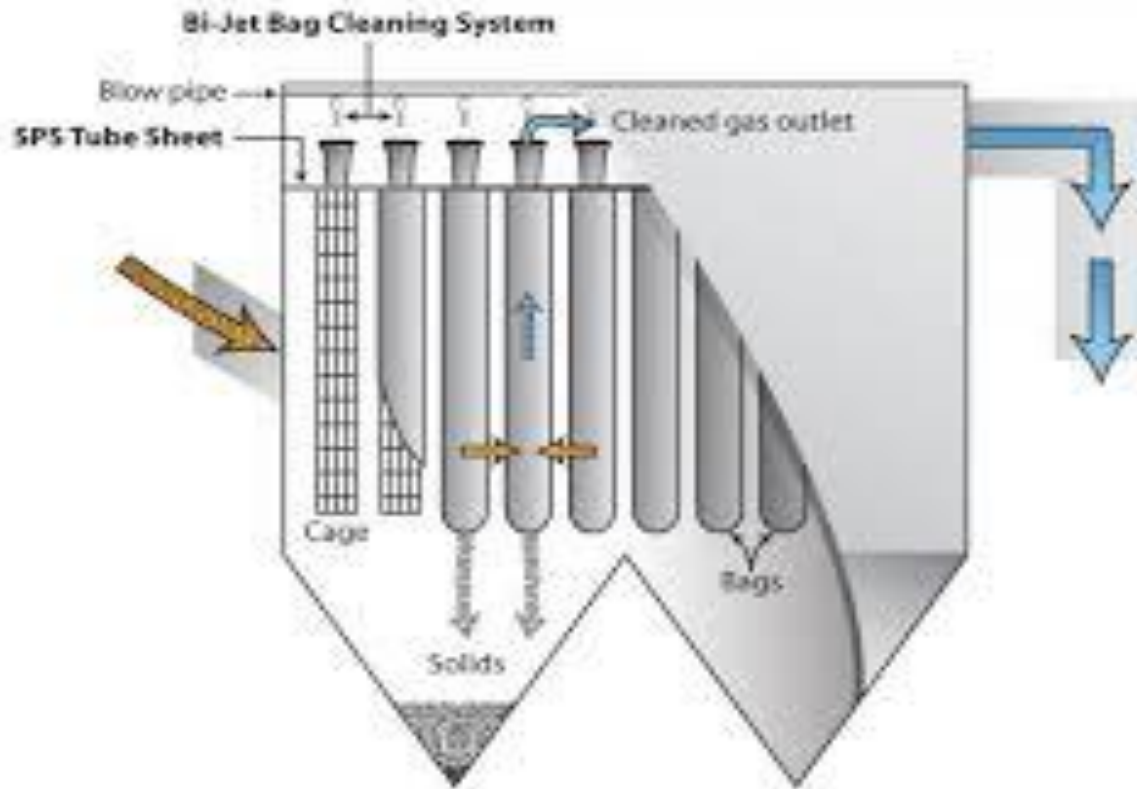


Fig. 5.2. Cyclone Separator
(Reverse Flow Cyclone)

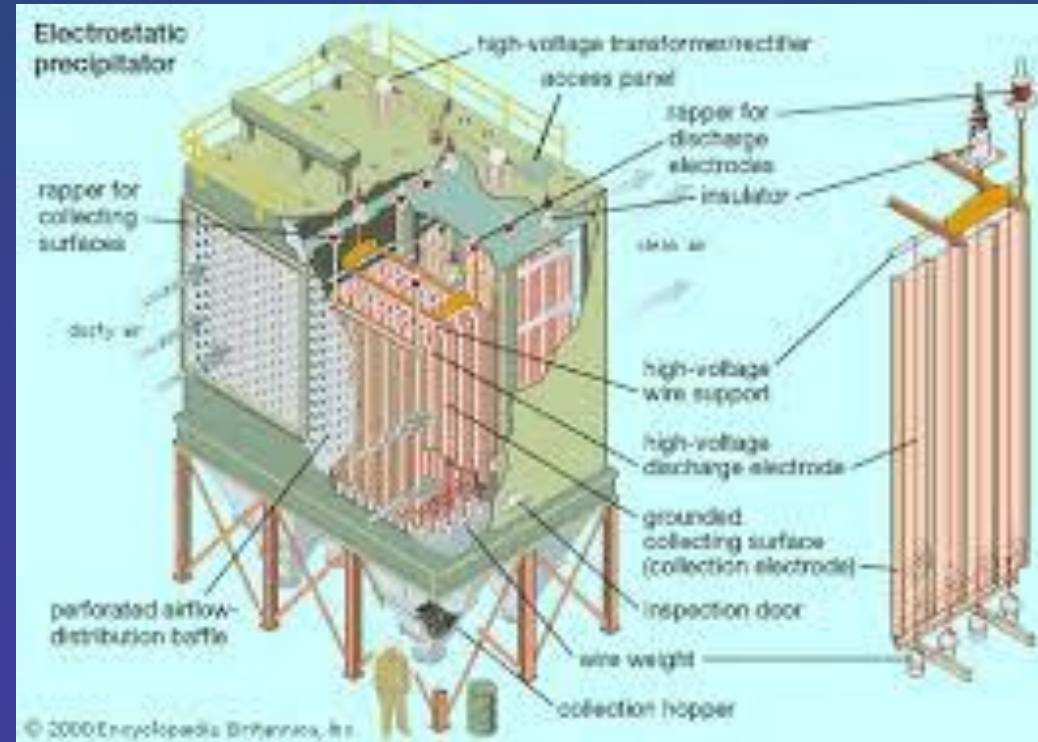
Cyclone Seperator

Advantage	Disadvantage	Used
Low Cost	Mid size particle size only	Lead Processing plant
Simple	Abrasion of inner surface	Mining
Low maintenance		Power plants
Continuous		



Fabric / Bag filters

Advantage	Disadvantage	Used
High collection efficiency	Low temperature (250C)	Lead Processing plant
Simple	High cost of bags	Mining
Continuous	Fires happen	Power plants



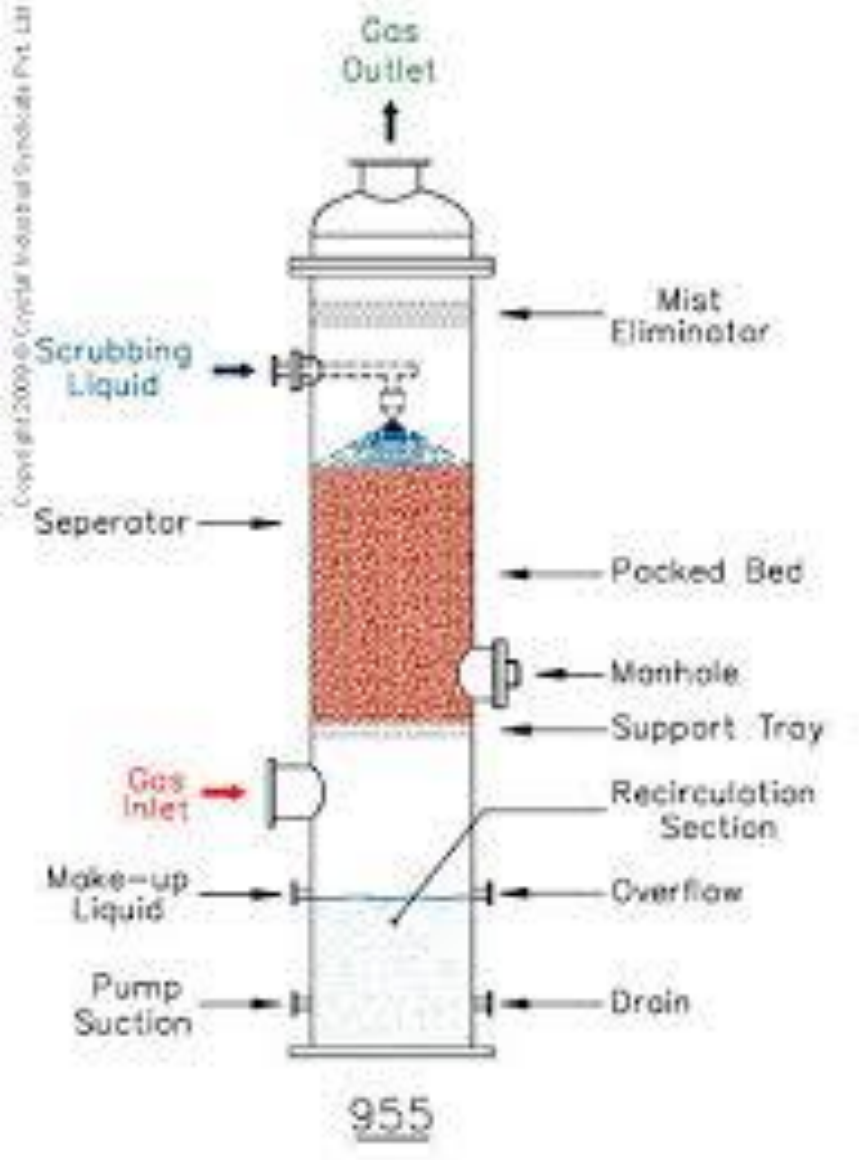
Electro Static Precipitator

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Advantage	Disadvantage	Used
High collection efficiency	High initial cost	Chemical Plants
Very small size particles can be removed	Space requirement	Refineries
Continuous	Fires happen	Power plants
All type of corrosive material can be removed	High voltage	

Wet Scrubbers

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Advantage	Disadvantage	Used
High collection efficiency	High initial cost	Chemical Plants
Very small size particles can be removed	High running cost	Refineries
Continuous	Leakages	Power plants
All type of corrosive material can be removed	Post treatment of water	
Gas and Liquid can be removed		
Poisonous gases / liquid can be removed		

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Water Pollution

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- ▶ Causes
 - ▶ Industrial waste
 - ▶ Sewage and home waste
 - ▶ Mining
 - ▶ Marine waste
 - ▶ Oil leakages
 - ▶ Burning of oils
 - ▶ Chemical plants
 - ▶ Leakage from land fills
 - ▶ Urban development
 - ▶ Animal waste
 - ▶ Leakage of storage – like oil

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Direct

- Can be detected
- Can be corrected

Indirect

- Goes in the ground water
- Pollutes a very wide area through underground

Control of Water pollution

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- ▶ Legal
 - ▶ ETP – effluent treatment plant
 - ▶ STP – sewer treatment plant
 - ▶ Not allow to dispose water out of factory
 - ▶ Real time monitoring of ETP / STP



<< ETP

STP >>



Process of water purification

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Sedimentation

- Removes solid wastes
- It settles below
- Large size tanks
- Large particles and heavy particles only

Coagulation

- Small particles join large particles
- Settles and removed

Filtration

- Suspended particles are removed
- Pass through bed of sand or Charcole, or fibre

Final Treatment

- ▶ Softening
 - ▶ Remove CaCO_3 & MgCO_3 by adding lime and soda ash
 - ▶ Hard compounds are settled
- ▶ Biological
 - ▶ Pump air to promote bacteria
 - ▶ Bacteria removes organic dissolved compounds to CO_2 .
 - ▶ Other biological harmful items are removed
- ▶ Disinfecting
 - ▶ Add chlorine to kill harmful bacteria
 - ▶ Pass through UV light
 - ▶ Ozone Gas is pumped

Indian Acts for Environment Protection

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- ▶ Indian Forest Act 1927, amended to 1984.
- ▶ Wildlife protection Act & Rules 1972, 1973, 1991
- ▶ Forest Conservation Act – 1981
- ▶ Biological Diversity Act -2002
- ▶ Water prevention & Control of pollution act – 1974, 1977, 1978
- ▶ The coastal regulation Zone – 1991
- ▶ Wetland Rules – A – 2010
- ▶ The Air prevention & Control of pollution – 1982, 1987

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ENVIRONMENT PROTECTION ACT -1986

- ❖ Section 7 :: No one can discharge any pollution in environment more than prescribed.
- ❖ Section 8 :: Handling of hazardous waste

Indian Forest Act - 1927

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- ▶ What is a forest, Transit and import of forest produce
- ▶ Forest offence and punishment.

Forest

- ✓ Reserved Forest
- ✓ Protected forest
- ✓ Village Forest
- ✓ Private , Common pastures.

Reserved Forests

- ▶ Very restricted. Forest Land or Waste Land.
- ▶ Government property, and all rights to government. State & centre
- ▶ Government can declare any land to be Reserve Forest (Sec 20 IFA)
- ▶ Uses by local people are prohibited (unless special permission by Forest Officer)

Protected Forests

- ▶ Owned by state governments.
- ▶ Normal use is OK, unless notified
- ▶ Specific Timber may be notified – where there is a commercial value.

Village Forests

- ▶ Owned by Villages or a community
- ▶ Traditional forest for bees, and other grazing.
- ▶ Revenue goes to the village or community.

Water (Prevention & Control of Pollution Act) 1974

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- ▶ Pollution control board are created with wide powers.
- ▶ Manage all types of water pollutions – sewage, effluents, trades, labs.
- ▶ Prior consent REQUIRED to set up any factory of any type.
- ▶ Sec 32 – can close plants, quarantine area, remove material.
- ▶ Sec 24 & 43 – What water to be used and where it is to be disposed.
- ▶ Sec 42 – can impose fine – close plants, even jail terms for key management people.

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Pollution Boards are becoming very strong. They are also under lime light of media. New introductions are real time data collection of water – and recording it in government servers. This recording is not very strict now, but is expected to become so. Target in India is to be a pollution free society.

Air (Pollution & Control) Act 1981

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- ▶ Central Board & State Boards
- ▶ Central – mainly policy and federal level work
- ▶ State – policy implementation and specific level work
- ▶ Wide powers
 - ▶ Can close any plant
 - ▶ Can enter and inspect any plant
 - ▶ Pre permission is required to start commercial operations.
 - ▶ Change pollution norms from time to time. (BS6)
- ▶ Real time data collection is being done from all specified industries. These will form the back bone of stricter compliance.

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Polluting industry has lesser value.
No ETP / Air cleaning – may have a scrap value ONLY.

The Environment Protection Act 1986

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- ▶ Comprehensive act – encompasses air, water, noise and other pollutants.
- ▶ Very wide powers
 - ▶ Declare the pollution norms
 - ▶ Revise the pollution norms.
 - ▶ Management of Hazardous waste (Lead, Chromium, Mercury etc)
 - ▶ Hospital waste (chemicals, needles, blood etc)
- ▶ Have power to take action and impose fines.

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India wants to reach the for front of environment protection and still develop at a fast pace.

Industrial Health & Safety

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- ▶ Factory's Act 1948
- ▶ Indian Mines Act 1952

Factory Act 1948

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- ▶ Very comprehensive – all factories are part of it.
- ▶ Makes guidelines for
 - ▶ Cleanliness
 - ▶ Disposal of waste and effluents
 - ▶ Ventilation and working environment
 - ▶ Dust / Fumes / Humidification / lightning
 - ▶ Drinking water & Toilets
 - ▶ Place for taking rest.
 - ▶ Working hours and rest hours.

Safety

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- ▶ Safety guidelines
- ▶ PPE
- ▶ Safety guards
- ▶ Lifts / cranes / fork lifts - regulations
- ▶ Pressure vessels – boilers / gas bullets
- ▶ Training of people for self safety
- ▶ Hospital / dispensary / First aid kits
- ▶ Working of women and children.

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International Safety and worker welfare are now mandatory for export oriented companies. The rules of the buyer country will apply.

Hazardous Material

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- ▶ Strict protocol for
 - ▶ Identification
 - ▶ Storage
 - ▶ Movement
 - ▶ Use
 - ▶ PPE
- ▶ Regular health check for people who are handling these.
- ▶ Women and children – not allowed.
- ▶ Safety committee
- ▶ Training for use and safety.

Working Hours & Others

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- ▶ Shift timings, rest after 4 hours, max working per day / per week.
- ▶ Rules for late night shifts
- ▶ Women in night shifts / type of work
- ▶ Leave rules – paid leave and others.
- ▶ Crèches where number of women is high
- ▶ Separate toilets

Factory act is quite commonly used. If there is no minimum safety and protection, it is difficult to get workers to work as well. The laws are also getting tighten, as per the changed social norms.

The Mines Act 1952

- ▶ Similar to Factory Act 1948, focussed to mines and provisions there of
- ▶ High content of workers
- ▶ Mine safety is a major concern
- ▶ Heavy equipment – that may cause harm
- ▶ Environment to be cleaned
- ▶ To avoid large scale mines disaster.

Hint....

- ▶ 3 to 5 questions
- ▶ Factory act, Forest Act – questions are usually there.
- ▶ Pollution control – usually one question
- ▶ No details of the act is asked.

Thanks
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