

BEFORE THE NATIONAL GREEN TRIBUNAL (SOUTHERN ZONE) CHENNAI

Original Application No. 30 of 2021 (SZ)

IN THE MATTER OF:

Dharmesh Shah

...APPLICANT

VERSUS

Union of India & Others

...RESPONDENTS

INDEX

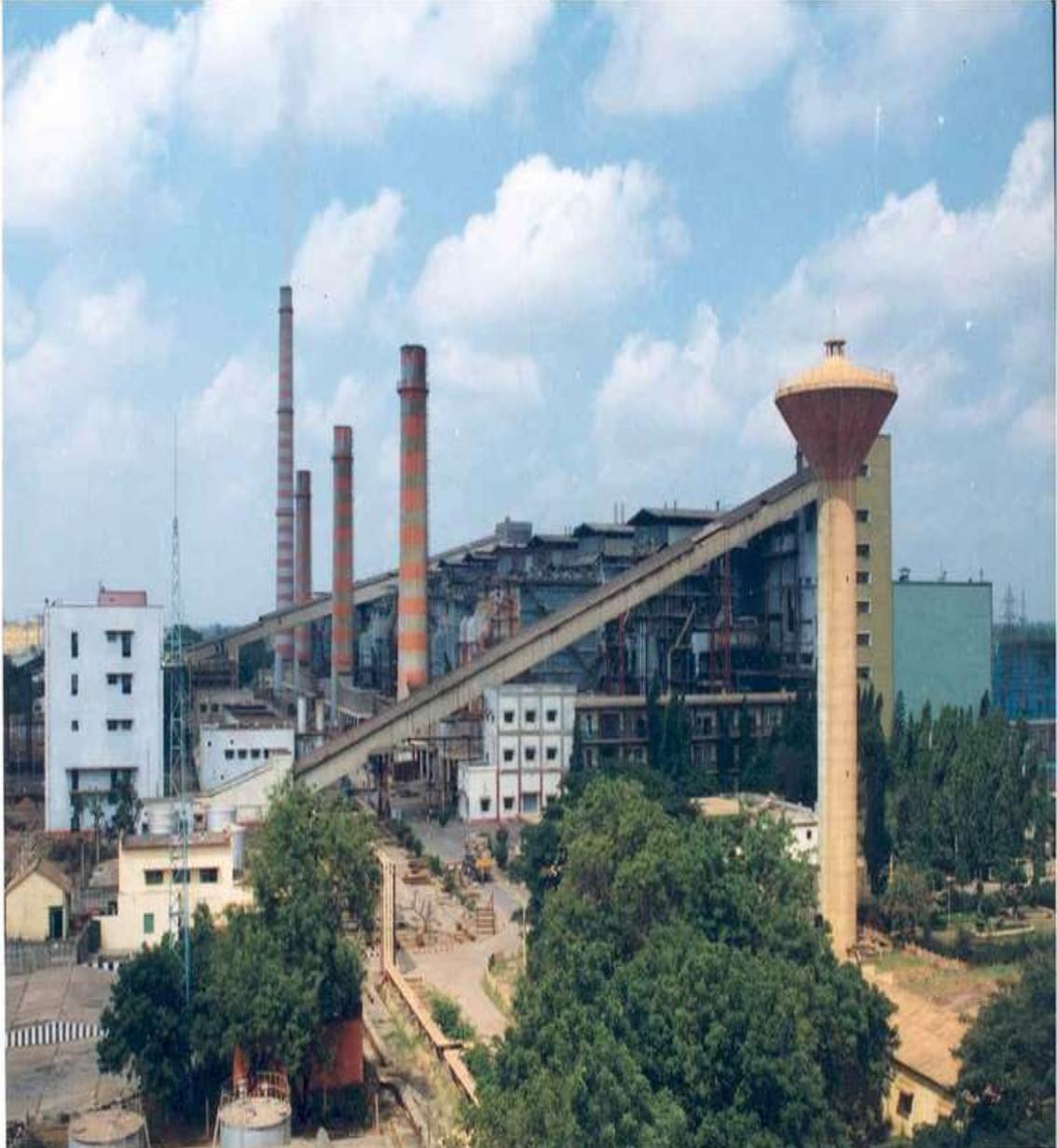
S. No	Particulars	Page No
01	Environmental Guidelines for Decommissioning a Coal/Lignite-Fired Power Plant (Draft)	01 - 11

Place: Chennai
Date : 22.07.2021



H.D. Varalaxmi
DEPONENT
H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC, Govt. of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate, Chennai - 600 059

Environmental Guidelines for Decommissioning a Coal/Lignite-Fired Power Plant (Draft)



July 2021

CONTENT

		Page
1.0	Introduction	1
2.0	Preliminary Planning, Options and Strategy	2
3.0	Environmental Regulations and Permissions	3
3.1	EMP and EIA	3
3.2	Environmental regulations	3
3.3	Occupational Safety and Health Administration (OSHA)	3
3.4	Permissions	3
3.4.1	Water (Prevention and Control of Pollution) act, 1974	4
3.4.2	Air (Prevention and Control of Pollution) act, 1981	4
3.4.3	Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016	
4.0	Waste management	5
4.1	Ash Management	5
4.1.1	Closure of ash ponds and ash impoundments	6
4.1.2	Capping of ash ponds and impoundments	6
4.2	Construction and Demolition Waste Management	7
4.3	Hazardous Waste Management	7
4.3.1	Asbestos	7
4.3.2	PCBs and Toxic Metals	8
4.3.3	E-Waste Management	8
4.3.4	Chemicals and Materials Removal and Disposal	8
5.0	Monitoring	8
	Notes	9

Environmental Guidelines for Decommissioning a Coal/Lignite-Fired Power Plant (Draft)

1.0 Introduction

Power plants are decommissioned after completion of their useful life, which varies generally from 30 to 45 year in India.

Environmental regulations have had, and will continue to have, a profound influence on the design of new and operation of existing power plants. Thus, the decision regarding decommissioning is primarily driven by plant operability, plant operation and maintenance costs, cost/benefit analysis, projected stricter environmental regulations, projected power demands, modular configuration of units, public support, etc.

Plant efficiency, operability, and new environmental standards, are resulting in more and more utilities choosing to decommission certain plants.

In last 5 years, 94 units of 9908 MW capacity have retired and another 14 units of 1988 MW capacity have been identified for retirement in near future.

Therefore, addressing environmental issues related to decommissioning a power plant properly is a primary concern of environmentalist and regulatory bodies.

NGT Order

Hon'ble National Green Tribunal (South Bench) in the matter O.A. No. 30 of 2021, Dharmesh Shah Versus Union of India and Others, vide order dated 23.03.2021 directed that:

“the Ministry of Environment Forests and Climate Change (MoEF&CC), Central Electricity Authority (CEA) and Central Pollution Control Board (CPCB) to constitute a joint committee of their own and evolve a policy or guideline as to how the decommissioning of Thermal Power Plant unit has to be carried out, prior to decommissioning of a thermal Power Plant and

if guidelines, already exists, then the committee can submit a report of the guidelines detailing how it is carried out to protect environment and if not evolve a guideline including manner of creating mechanism to supervise as to how it is being properly implemented by the power plant and mining area”.

Joint Committee

In compliance to the above order, a joint committee of Mr. Sundeep, Director, MoEF&CC, Mr. Sunil Kumar Jain, Director, Central Electricity Authority, and Dr. S.K. Paliwal, Additional Director, Central Pollution Control Board was constituted. Further vide letter dated 16.06.2021, CEA nominated Mr. K.B. Jagtap, Director (TE&TD Division) in place of Mr. Sunil Kumar Jain, Director, Central Electricity Authority.

2.0 Preliminary Planning, Options and Strategy

The extent of decommissioning and cleanup is also determined by the planned future use of the plant site. Predetermining the future use of the site can help reducing the costs of dismantling and cleanup if buildings and infrastructure are to be retained, properly choosing the environmental remediation methods to meet specific needs, the cleanup standards to be attained may be less stringent. Power generating companies usually approach decommissioning by considering the following:

- I. Maintain the site at present condition with minimal cleanup to meet environmental compliance and ensure safety (i.e., remove chemicals and oils, restrict access, etc.)
- II. Perform minimal dismantling and demolition in addition to maintaining the site under control conditions to meet environmental compliance and ensure safety (i.e. remove saleable and salvageable equipment, remove safety hazards, etc.)
- III. Dismantle to the degree required to meet specific needs of a planned reuse of the site (i.e. remove internals of powerhouse or other buildings so that those structures can be remodeled inside and reused; remove some exterior structures or systems, such as coal handling systems, clean up coal yard, retaining foundations; meet environmental standards regarding cleanups; etc.)
- IV. Full decommissioning (i.e. dismantle all equipment; demolish all buildings and structures; clean up entire site, including wet and dry disposal areas, coal yards, etc. as per required environmental standards.)

Once a decommissioning strategy is selected, the company shall identify the agency to carry out all dismantling, demolition, and clean-up tasks. The following approaches may be taken:

- The utility manages the project and performs all dismantling, demolition, and clean-up tasks.
- The utility manages the project but contracts the decommissioning tasks to contractors.
- The utility contracts decommissioning as a turn-key operation.

3.0 Environmental Regulations and Permissions

3.1 EMP and EIA

Prior to initiating decommissioning, the plant shall prepare an Environmental Management Plan (EMP) and also carry out an Environmental Impact Assessment (EIA) for the decommissioning process. Post closure EMP should be got approved from the regulatory body

Laws on environmental and safety issues, as well as community concerns should be taken into account and necessary permission taken prior to initiating the decommission process.

3.2 Environmental Regulations

Compliance with environmental statutes must be maintained throughout demolition and remediation. The provisions under the Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution Act, 1981 and the Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016 (HWM Rules 2016), Construction and demolition Waste Management Rules, 2016, the rules/notifications regarding management and utilization of combustion residue/ash and local regulation must be met.

3.3 Occupational Safety and Health Administration (OSHA)

Prior to permitting demolition operations, an engineering survey of the structure must be made by a competent person. The Building & Other Construction Workers (Regulations of Employment and Conditions of Service) Act, 1996 regulates buildings' demolition in Section 40. Also, The Factory Act, 1948 and regulations therein should be followed at all times for training, planning, personal protective equipment, markings, tools, electrical equipment, scaffolds, hoisting equipment, excavation, blasting, etc. A dedicated in-house team or a competent contractor who is familiar with these requirements should be entrusted this task.

3.4 Permissions

Existing permissions/consents must be modified, revised, or new permits obtained for demolition and remediation process.

The permitting process may include maintaining or revising the old permits/consents/authorization or issuing a new permits/consents/authorization under provisions of the Water (Prevention and Control of Pollution) Act, 1974, Air

(Prevention and Control of Pollution Act, 1981, the Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016 (HWM Rules 2016) and Construction and Demolition Waste (Management) Rules, 2016.

The conditions of permits/consents/authorization applicable to a plant will depend on the various aspects. Plants located in the middle of a coal field or in an urban areas may have additional environmental concerns that must be considered during decommissioning and that are not common to the general plants.

Compliance must also be maintained regarding any permit conditions that have post-closure requirements, such as for ash ponds, hazardous waste storage, or chemical cleaning. Necessary approvals/permits should be obtained from State Environment Department and SPCB before actual commissioning commences.

3.4.1 Water (Prevention and Control of Pollution) act, 1974

Shutdown of operations will result in the reduction or cessation of wastewater discharges to receiving waterbodies. However, storm water discharges may continue during and/or after the demolition and remediation of the plant. Some of these discharges may even need to be re-routed. The Consent To Operate (CTO) must be revised to account for any changes in discharges of wastewater or storm water. For remediation of the coal storage yard or other similar areas where substantial area is disturbed, a storm water permit must be obtained from regulatory officials. Other suitable condition for water and soil protection / remediation may be included in Consent.

3.4.2 Air (Prevention and Control of Pollution) Act, 1981

Decommissioning activities can result in visible emissions from demolition of buildings and disturbance of the soil. Any changes due to expected visible emissions should be communicated to regulators, and changes in permission or new applications should be made.

3.4.3 Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016

Decommissioning/dismantling activities will result in generation of metal scrap, construction and demolition materials, waste oil and oil sludge, and hazardous waste like asbestos bearing sheets, PCBs, mercury thermometers etc. as well as e- waste, which need to be collected, transported, and disposed as per the provisions stipulated under HWM Rules, 2016.

Risk Management Plans (RMPs) should be reviewed when onsite storage of chemicals ceases. RMPs must be updated and resubmitted before changes are made at the site.

4.0 Waste Management

During operation of the plant, water treatment wastes, waste oils, oily refuse, wastewater treatment wastes, degreasers, solvents, blowdown/metal-cleaning, building sump wastes, and general refuse materials, and ash are mainly generated as wastes. These wastes are either treated and/or disposed onsite in permitted facilities, and others are or sent offsite for recycle/disposal as per Consent-to-Operate under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act 1981, respectively. Waste oil and oil sludge are disposed as per HWM Rules, 2016.

Coal-fired power plants typically maintain inventories of various types of chemicals and materials essential to the operation of the plant. Prior to ceasing the plant operations, plans should minimize onsite inventories, either through use or transfer to other facilities.

Due to decommissioning and dismantling of the plant in addition to ash, other materials and wastes like metal scrap, and hazardous waste like waste oil, oil sludge, asbestos bearing sheets, PCBs, mercury thermometers etc. and e- waste need to be managed in environment friendly manner. If decommissioning involves demolition then the construction and demolition waste shall be disposed off in an environment friendly manner as per the Construction and Demolition Waste (Management) Rules, 2016.

4.1 Ash Management

Fly ash, boiler ash and boiler slag are not characterized as hazardous waste under Schedule I of HWM Rules, 2016. These wastes have instead been identified as “high volume low effect wastes.

Fly ash and bottom ash is generally disposed into ash ponds or utilized for some gainful purposes by cement industries, brick making or ash dyke raising etc. as per CTO and as per provisions of the fly ash utilization notification 1999, as amended in 2003, 2009 and 2016. Some plants may have permits/consents for dry stacking of bottom ash or both bottom ash & fly ash.

4.1.1 Closure of ash ponds and ash impoundments

Closure of ash ponds (surface impoundments) probably will be the most challenging tasks to undertaken during a decommissioning process.

Permitted solid waste landfills or surface impoundments should be closed as per the post closure plans approved by SPCB. Many of the plants being decommissioned are very old. Some of these permitted facilities may not be designed for proper containment per the latest regulations (i.e., clay or synthetic liners) and will require coordination with the SPCB to determine proper closure.

Surface impoundments permitted under Consent order during operation phase may not have a specified post-closure plan on record with the pertinent regulatory office and may require separate permission for closure. Surface impoundments may be included in the revised / new Consent order and regulated under solid waste regulations until after operation of the impoundment has ceased for a specified number of days.

4.1.2 Capping of ash ponds and impoundments

Closure of most surface impoundments of the power plant will require drainage, placement of an impermeable cap, and topping with soil and a vegetative cover until full compliance with ash utilization notification is achieved. Proper placement of the cover and specified slopes will be required. The type and depth of cover required may vary based on the waste disposed in the impoundment.

The caps for the impoundments will require continued maintenance to maintain the site contours, vegetative cover, and drainage. Such impoundments will require the installation and monitoring of groundwater wells.



Figure 1: Storage of fly ash require closure according to the post-closure plans for the site.

4.2 Construction and Demolition Waste Management

During dismantling the plant buildings, chimney, overhead tanks, cooling towers, ETP and other civil facilities, large amount of debris will be generated which is categorized as Construction and Demolition waste. The C&D waste to be generated needs to be managed in an environment friendly manner as per Construction and Demolition Waste (Management) Rules, 2016. Improper demolition, collection, transportation and disposal of C & D waste may generate dust and noise and cause air pollution. Because the volume of waste to be disposed may be drastically increased with a plant's decommissioning, the CTO should be reviewed for possible amendments required regarding changes in amounts and types of wastes.

Plant authorities/agency involved in dismantling of plant must adhere to the provisions of Rules and shall take all preventive measures. The C & D waste shall be disposed of through waste processing facility having authorization as per Rules from the concerned SPCB.

The general conditions / procedures for control of air pollution as prescribed in environmental clearance for construction activities should be imposed as Consent condition for carrying out dismantling activities.

4.3 Hazardous Waste Disposal

Inventory of hazardous waste, waste oil, oil sludge, asbestos containing sheets, PCBs and mercury thermal meters shall be prepared. These wastes shall be transported and disposed in accordance to the provision of HWM Rules, 2016.

A plants may have surface impoundments for metal-cleaning wastes, boiler blow down or makeup water treatment sludge. Such temporary storage must be closed as per the approved post-closure plan under HWM rules 2016.

4.3.1 Asbestos

The removal of asbestos-containing material (ACM) in older plants will involve significant expense and require completion before workers can safely begin equipment salvage and demolition activities. ACM abatement work should begin with a survey of ACM at the plant site to estimate the scope of the task. Authorization under HWM Rules 2016 will be required before removal of asbestos, good recordkeeping, and proper disposal techniques. ACM is difficult to identify in a survey, and some locations where ACM was used often are not discovered until the demolition process has begun. Therefore, contracts for second party ACM abatement should be carefully written and reviewed.

4.3.2 PCBs and Toxic Metals

Old plants will have instrumentation/equipment containing, polychlorinated biphenyls (PCBs) at regulated concentrations. PCB is an additive to transformer oil. Transformer oil is used as coolant and insulating medium in power transformers. Transformer oil with PCB is remained in transformers. The PCBs should be removed and disposed, or the equipment containing PCBs should be disposed as per HWM Rules 2016.

In addition, PCBs may also be present in electrical cables, wiring, fire retardant coatings, hydraulics, relays and controls inside the control room, and various items of switch yard equipment. All equipment or cables containing PCBs or toxic metals must be managed per regulations specified by the HWM Rules 2016.

Similarly, mercury containing light bulbs and florescent lighting should also be removed and disposed through authorized hazardous waste recycling facility under HWM Rules 2016 and under intimation of concerned SPCB.

4.3.3 E-Waste Disposal

During dismantling, E-Wastes like switches, desktops, electric and electronic panels need to be disposed/recycled as per the E-Waste (Management) Rules, 2016. Proper authorization for management of E-Waste need to be taken as per Rule 13 of the E-Waste (Management) Rules, 2016.

4.3.4 Chemicals and Materials Removal and Disposal

During dismantlement, other chemicals and materials should be removed and disposed or recycled. Any laboratory chemicals or inventories of chemicals, which cannot be completely used before shutdown, should be sent for reuse at other company facilities, sold, or disposed properly. Freon, batteries, and residual oil, used lubricants, fuel, metal-cleaning chemicals etc. should be reused, recycled, or disposed of with proper authorization from SPCB under HWM Rules 2016.

If a plant has Underground Storage Tanks (USTs), the plant should already be registered with regulatory officials. Removal of the USTs should be performed in accordance with UST regulations.

5.0 Monitoring

Decommissioning and dismantling activities waste transportation/disposal shall be supervised by with a dedicated team of the concerned power plant headed by officer of the level of General Manger. The process shall be monitored by SPCB through periodic inspections.

Notes:

1. These draft guidelines are based on the knowledge and expertise available with the Committee members with limited consultation with stakeholders. Wider consultation with major stakeholders will be undertaken before its finalization and issuance.
2. As regards any captive mines associated with the power plant to be decommissioned, Indian Bureau of Mines (IBM) has already have guidelines for preparation of Mine Closure Plan. Waste Management is part of the Mine Closure Plan which needs to be followed for disposal of waste in mining area.

**BEFORE THE NATIONAL GREEN
TRIBUNAL (SOUTHERN ZONE)
CHENNAI**

Original Application No. 30/2021 (SZ)

IN THE MATTER OF:

Dharmesh Shah

...APPLICANT

VERSUS

Union of India & Others

...RESPONDENTS

**ENVIRONMENTAL GUIDELINES
FOR DECOMMISSIONING A COAL/
LIGNITE-FIRED POWER PLANT
(DRAFT) FILED ON BEHALF
CENTRAL POLLUTION CONTROL
BOARD (CPCB)**

Advocate T N C Kaushik

COUNSELS FOR CPCB