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Report on the Best Practices Adopted for Biomass Cofiring at APCPL Jhajjar

1. Development of a New SAP-Based Module for Biomass Billing:

A new SAP-based module has been developed to streamline the biomass billing process. This system enables the storage of detailed data for each truck, including associated laboratory reports, within SAP. As a result, invoice generation and parking processes have become significantly faster, leading to improved efficiency and reduced processing time for billing activities.

2. Vendor Engagement and Farmer Awareness Initiatives:

Regular meets and workshops are conducted with vendors and biomass business partners to facilitate the smooth and effective execution of contracts. Additionally, awareness programs—including workshops and *nukkad natak*s—are organized to educate nearby farmers on the adverse impacts of stubble burning, thereby promoting sustainable practices and contributing to pollution reduction.

3. Vendor Support and Issue Resolution Mechanism:

Weekly meetings (Every Tuesday) are conducted, and a dedicated helpline number is maintained to promptly address queries and resolve issues faced by biomass vendors, ensuring efficient and uninterrupted operations.

4. Revision in Tender for preventing Extraneous material:

A) Revision in Tender Specifications for Biomass Pellet Quality Improvement:

In the new tender, the maximum permissible diameter of non-torrefied biomass pellets has been reduced from 25 mm to 10 mm. This revision aims to prevent the mixing of extraneous materials within the pellets. The implementation of this specification has led to a significant improvement in pellet quality. Furthermore, this provision is designed to uphold material integrity and ensure that substandard deliveries are not accepted.

B) Revision in Contract Clause for Handling Extraneous Material:

In the new contract, the clause pertaining to the segregation of extraneous materials has been removed, as the segregation of such materials from biomass pellets is practically not feasible. Under the revised provisions, if extraneous material is detected in any truck, the entire quantity of that truck is treated as extraneous. Accordingly, actions are taken in line with the terms and conditions specified in the contract. This approach ensures strict quality control and discourages the supply of contaminated material.

C) Materials that are likely to generate objectionable or unpleasant odours—such as press mud, animal dung, municipal solid waste (MSW), and poultry farm waste—is not permitted for use in pellet manufacturing. Such substances are classified and treated as extraneous materials.

5. Implementation of Entry Token System for FIFO-Based Unloading:

An entry token system has been introduced at the time of the first weighment at the weighbridge to ensure adherence to the First-In-First-Out (FIFO) principle for unloading biomass pellets. This initiative has streamlined the unloading process, improved operational efficiency, and minimized congestion by maintaining an orderly sequence of vehicle movement.

6. Fixation of Gate Entry Timings for Biomass Trucks:

Fixed gate entry timings for biomass trucks have been implemented from 06:00 AM to 12:00 PM, including Sundays and holidays. This measure ensures that unloading activities are completed during daytime hours, thereby enhancing manpower safety and enabling better quality monitoring. Additionally, it contributes to improved operational planning and overall process efficiency.

To ensure that unloading activities are carried out during daytime hours, thereby enhancing manpower safety and enabling more effective quality monitoring, the gate entry timings for biomass trucks are periodically revised with proper communication to vendors. This approach also supports improved operational planning and overall process efficiency.

7. Monitoring of Truck Movement at Plant Gate:

Truck entry and exit timings at the plant gate are being closely monitored in coordination with the CISF team. This initiative enhances control and accountability while ensuring effective tracking of vehicle movement within the plant premises. It also contributes to improved security, operational discipline, and overall process efficiency.

8. Safety Briefing at Entry Gate:

Safety briefings are conducted at the entry gate by the Safety Department to educate the truck drivers on prescribed speed limits, designated routes, and important do's and don'ts within the plant premises. This initiative enhances driver awareness, promotes safe driving practices, and contributes to overall safety within the plant.

9. Mandatory Provision of Reverse/Back Horn in Transport Vehicles

All transportation vehicles deployed by the vendor/transporter shall be mandatorily equipped with a functional reverse/back horn. The installed system must comply with the applicable provisions of the Central Motor Vehicles Rules, 1989 (Section 119), as well as the standards prescribed by the Bureau of Indian Standards (IS 15796:2008) for horn installation requirements.

10. Prohibition of Unauthorized Vehicle Modifications:

Any form of body extension, structural alteration, or modification to vehicles used for transporting biomass pellets is strictly prohibited. All vehicles must conform

to standard dimensions and specifications as approved by the relevant transport authorities. Non-compliant vehicles are denied entry, and the associated consignment is rejected.

11. Deployment of Flagman for Safe Vehicle Movement

A flagman equipped with red and green flags has been deployed near the weighbridge and at identified blind spots to guide truck drivers and ensure safe vehicle movement. This initiative enhances visibility, reduces the risk of accidents, and promotes smooth and controlled traffic flow within the plant premises.

12. Escorting Drivers for Safe and Controlled Movement:

Drivers are escorted by the unloading supervisor from the weighbridge to the sampling point and unloading area to ensure strict adherence to safety protocols. This practice enhances operational control, minimizes the risk of unsafe practices, and ensures compliance with established procedures during material handling activities.

13. Fabrication of Dedicated Multi-Level Sampling Platform

A dedicated sampling platform has been fabricated in accordance with the varying heights of trucks, incorporating multiple landing levels for ease of access by the Chemistry Department. The platform is equipped with a top sampling facility, lifeline rope, safety belt, and provision for auger sampling. This infrastructure ensures safe, efficient, and representative sample collection while adhering to established safety protocols and quality assessment requirements

14. Best Practices of Biomass sampling:

- a. The sample is collected using Augur sampler for faster & representative sampling.
- b. APCPL has one Biomass sample preparation and testing lab near sampling yard for faster communication of results (TM, Fines & size).
- c. The samples are sealed as soon as they are collected in bags with single use plastic seals to avoid any kind of sample tempering/mishandling.
- d. Quantity reduction of collected sample is being done using Ruffle sample divider instead of manual Coning & quartering.
- e. The Sample collection, sample Preparation is being done under the CCTV surveillance cameras.
- f. The size measurement of biomass pellets is done using digital Vernier callipers
- g. The samples are pulverised in Pulverisers to obtained faster 1mm sized samples for testing.
- h. The referee samples are being sent to third party testing labs on rotational basis with 10-digit Alpha numeric code to conceal the identity of biomass samples.

15. Designated and Organized Parking Area

A designated and properly marked parking area has been established with an aligned parking system to prevent congestion and ensure smooth traffic movement. This initiative enhances operational efficiency, improves space utilization, and facilitates orderly vehicle management within the plant premises.

16. Identification of Multiple Unloading Locations

Four dedicated unloading locations have been identified and are being effectively utilized to streamline operations and reduce vehicle turnaround time. This measure enhances unloading efficiency, minimizes delays, and supports smooth handling of incoming biomass consignments.

17. Unloading Protocol

An unloading protocol has been established based on truck type to ensure safety and efficiency within the unloading area:

- a. *Hydraulic Trucks*: Permitted entry and unloading on a one-at-a-time basis.
- b. *Manual Trucks*: A maximum of three trucks are allowed simultaneously in the unloading area.

This structured approach helps regulate traffic flow and minimizes operational risk during unloading activities.

18. Communication and Safety Protocol

The unloading supervisor is required to use whistle signals mandatorily to ensure clear communication and effective control of truck movements within the unloading area. This practice enhances coordination, minimizes the risk of miscommunication, and promotes overall operational safety.

19. Implementation of Two-Stage Cleaning Protocol for Manual Unloading Trucks:

A two-stage cleaning protocol has been implemented for manually unloaded trucks to enhance safety and operational efficiency. The process includes initial cleaning using an excavator (Poclain machine), followed by secondary manual cleaning at a separately designated location. This approach minimizes direct exposure of manpower during the primary unloading phase and ensures improved safety standards while maintaining effective cleaning of vehicles.

20. Enhanced Housekeeping of Unloading Areas

Proper and enhanced housekeeping practices are being ensured in unloading and surrounding areas to prevent the accumulation of spillages, reduce fire hazards, and maintain safe working conditions.

21. Provision of Adequate Lighting in Operational Areas

Adequate lighting arrangements have been provided in unloading and material handling areas to ensure proper illumination for safe and efficient operations. This

measure enhances visibility, reduces the risk of accidents, and supports safe working conditions during all stages of handling activities.

22. Installation of Fog Cannon for Dust Suppression”

Fog cannon systems have been installed and are in operation at TP-15 and TP-16 to ensure effective dust suppression and improve the working environment. This initiative helps in controlling airborne particulate matter, enhancing visibility, and promoting safer and healthier conditions for personnel in the operational areas.

23. Provision of Dedicated Drinking Water and Washroom Facilities:

Adequate drinking water facilities, including water coolers equipped with RO system, has been provided along with washroom facilities for manpower and truck drivers. This initiative ensures the well-being, comfort, and hygiene of personnel, contributing to improved working conditions within the plant premises

24. Provision of Dedicated Rest Area and Pantry for Truck Drivers:

A dedicated rest area has been developed for truck drivers near the parking, equipped with air coolers, ICH pantry and bunk beds to ensure adequate rest and comfort. This facility helps in reducing driver fatigue, thereby enhancing alertness and promoting overall safety during operations.

25. Installation of Belt Feeders for Uniform Biomass Blending:

Dedicated belt feeders have been installed and are being utilized at strategic locations with interlocks and protection to facilitate controlled and uniform blending of biomass pellets. This system enhances consistency in fuel mixing, improves combustion efficiency, and supports stable plant operations.

26. In-House Modification of Control Logic for Biomass Feeding:

In-house modifications have been implemented in the control logic of the coal conveying system to enable uniform and controlled feeding of biomass pellets into the bunkers. This enhancement improves fuel distribution consistency, optimizes blending efficiency.

Compiled by APCPL Team

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Best practices being followed at GGSSTP, Ropar regarding co-firing of biomass pellets with coal.

With reference to the subject matter and discussions held during the review meeting on 06.05.2026 with NCR TPPs under Direction No. 42 issued by CAQM, it is submitted that the following best practices are being adopted at GGSSTP, Ropar for smooth and effective biomass co-firing operations:

Biomass suppliers/truck operators are instructed to ensure timely arrival of vehicles for testing so that unloading activities can be carried out without delay.

1. Proper monitoring of the sampling process is being ensured strictly as per the approved SOPs.
2. Quality checks of biomass pellets are conducted before acceptance to ensure compliance with prescribed specifications.
3. Timely payment of biomass bills is being made to ensure smooth operations and uninterrupted supply.
4. Manpower deployed for biomass handling and co-firing operations is regularly briefed regarding SOPs and safety measures.
5. Efforts are being made to maintain uninterrupted biomass supply through advance planning and coordination with vendors.

Best practices being followed at DCRTTP, HPGCL, Yamuna Nagar regarding co-firing of biomass pellets with coal.

Biomass torrefied pellets are being used at 2x300 MW DCRTTP, HPGCL, Yamuna Nagar, for blending with coal to meet the targets of mandatory co-firing of biomass pellets as per policy of Ministry of Power, Govt. of India. Practices being followed at DCRTTP, are as under:

1. Biomass torrefied pellets are being supplied at DCRTTP Yamuna Nagar by 6 Nos. firms against the various POs issued from the office of Chief Engineer, Planning, HPGCL, Panchkula to meet the mandate target of co-firing. Earlier there was only one supplier for all HPGCL plants. The name of all the 6 no. suppliers are as under:
 - i) M/s Beyond Drilling & Exploration Pvt. Ltd, New Delhi- PO for 261 MT/Day
 - ii) M/s Jai Chaudhary Trading Company, Jind- PO for 50 MT/day
 - iii) M/s Shivam R K Contracts Pvt. Ltd., Yamuna Nagar- PO for 50 MT/day
 - iv) M/s Green Earth Coal and Logistics Pvt. Ltd., Karnal- PO for 50 MT/day
 - v) M/s ASVA renewable Energy LLP, Yamuna Nagar- PO for 50 MT/day
 - vi) M/s RPM Infratecher LLP, Noida -PO for 50 MT/day
2. Pellets are being received on daily basis in trucks. Sampling & analysis work of Pellets is being carried out at Plant lab under supervision of Chief Chemist of the plant as per SOPs circulated by the Ministry and in the presence of members of committee constituted by HPGCL from time to time.
3. After clearance from plant lab on Total Moisture (TM), trucks having moisture <14% are allowed for unloading at the CHP site and trucks having moisture >14% are returned back on rejection. Thereafter, samples in respect of each supplier are further tested for other parameters like GCV, HGI, fineness etc. and corresponding results declared by lab are being shared with the suppliers regularly.
4. CCTV cameras are installed for proper surveillance of the work of sampling & analysis of pellets.
5. Pellets are being consumed mostly on daily basis after blending with coal.
6. Blending of pellets is being done in all the coal mills except base mill in both units to avoid any flame disturbance in the boiler furnace.
7. Message conveyed to operation control room team of both units by CHP div on daily basis regarding pellets feeding mill bunkers for proper monitoring of the mills and other plant parameters.
8. In rainy days, material is supplied by the firms in trucks covered with tarpaulin. Plants have also arranged tarpaulin for covering the pellets during rain. In case of heavy rains, trucks are unloaded at covered Tippler hoppers for further blending with coal.
9. Interlocks have been provided in the conveyor system in such a manner that, if conveyor carrying the coal trips then the conveyor carrying pellets will automatically trip to avoid feeding of pellets only in the main unit bunkers and to ensure proper blending of both fuels.
