Drax Pellet Operations
HSE

Wood Dust Management Control Program

1. PURPOSE:

Drax is committed to conducting business without causing harm to people or the environment. The purpose of this Combustible Dust Management System is to:

Detail the primary roles and responsibilities for the effective management of Combustible Dust and to outline the key tools and procedures designed to underpin Combustible Dust management. To provide instructions and information necessary to ensure that fire, deflagration, and explosion risks associated with wood dust are managed effectively

2. SCOPE:

This procedure applies across DBPP production facilities.

3. APPLICABLE FORMS & DOCUMENTS:

3.1 Hot Work, DPO-HS-1112
3.2 Hazard Communication, DPO-HS-1131
3.3 Personal Protection Equipment, DPO-HS-1128
3.4 Respiratory Protection Program, DPO-HS-1132
3.5 Dust Score Card, DPO-HS-1114-A-01

4. ROLES AND RESPONSIBILITES

4.1 The VP of OPERATIONS, North & South - Is responsible for setting Health & Safety expectations and for ensuring that suitable and sufficient resources are in place for the effective management of Health & Safety.

4.2 The DIRECTOR OF HEALTH, SAFETY & ENVIRONMENT, North & South - Is responsible for ensuring that policies and procedures are in place to comply with Federal & Local Regulatory H&S Standards. In addition, he/she will ensure that suitable arrangements are in place to deliver to what is set out in the Health & Safety Policy.

4.3 GENERAL MANAGER - Is responsible for ensuring employees receive sufficient information, instruction and training and are competent to perform their role safely. He/she is responsible for ensuring that employees comply with health and safety standards.

4.4 PLANT MANAGER - Is responsible for ensuring employees under his/her control receive sufficient information, instruction and training and are competent to perform their role safely. He/she is responsible for ensuring that employees comply with health and safety standards and that plant standards in their plant area are maintained to an acceptable standard.

4.5 SUPERVSIOR - Is responsible for ensuring employees under his control receive sufficient information, instruction and training and are competent to perform their role safely. He / she shall carry out field audits to check that health and safety procedures are followed.

4.6 EMPLOYEE - Is responsible for their own safety and the safety of others who may be affected by their acts or omissions. He / she shall comply with health and safety procedures.

5. PROCEDURE:

In accordance with the Federal & Local Regulations for Combustible Dust Management.

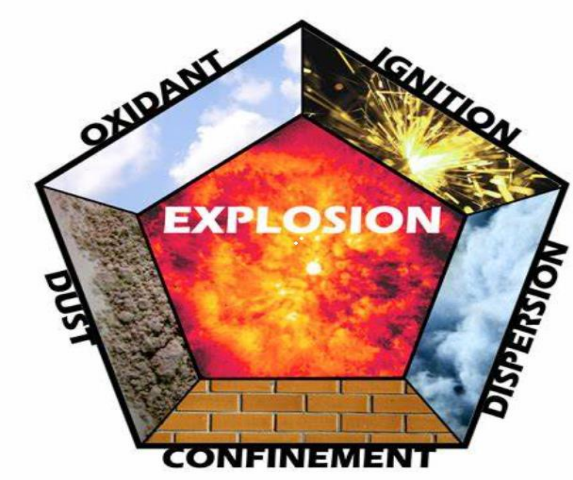
6. DEFINITION:

Combustible dust – A finely divided combustible particulate solid that presents a flash-fire hazard or explosion hazard when suspended in air or the process-specific oxidizing medium over a range of concentrations.

Deflagration – Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium.

Fugitive Dust – Dust that escapes from equipment and containers.

Spark – A localized source of thermal or electrical energy capable of igniting combustible material.



7. DUST STANDARDS:

7.1 RISK OF FIRE, DEFLAGRATION, AND EXPLOSION

7.1.1 The primary means of preventing wood dust fires, deflagration or explosions occurring is to prevent wood dust from being released from the process. It is equally important to prevent combustible dust from encountering sources of ignition or surfaces at or above the minimum ignition temperature of combustible dust.

7.1.2 It is feasible that fires or explosions could occur within the process equipment and although this situation is undesirable, necessary fire systems and pressurization venting systems are installed to mitigate the risk of fire or explosions, per process safety design and risk criteria.

7.2 HAZARDS TO HEALTH FROM WOOD DUST

7.2.1 Exposure to wood dust has long been associated with a variety of adverse health effects, including dermatitis, allergic respiratory effects, mucosal and non-allergic respiratory effects, and cancer. Contact with the irritant compounds in wood sap can cause dermatitis and other allergic reactions. The respiratory effects of wood dust exposure include asthma, hypersensitivity pneumonitis, and chronic bronchitis.

7.2.2 The primary means of protecting people from the adverse effects of wood dust is to prevent or minimize exposure by engineered controls, such as containment or ventilation systems, administrative controls such as work practices and operating procedures, and through the use of PPE, as needed.

7.2.3 Where it is necessary to work in areas where wood dust is present, i.e. when cleaning up wood dust or carrying out maintenance, individuals should wear suitable protective clothing for the task and maintain good personal hygiene standards. The Task Risk Assessment will establish what personal protective equipment is necessary to carry out the work. Typical PPE required for working where combustible dust is present is a NIOSH approved N-95 face mask, gloves, coveralls and safety glasses or goggles. Further guidance can be found in (DPO-HS-1131 *Hazard Communication*, (DPO-HS-1132 *Respiratory Protection Program* and (DPO-HS-1128) *Personal Protection Equipment.*

7.3 WOOD DUST CONTROL ARRANGEMENTS:

7.3.1 Dry wood processing and handling equipment shall be inspected to identify any leaks or build-up of wood dust. The inspection must be thorough and include hidden areas. The inspection shall be down by Operational staff daily.

7.3.2 The maximum depth of dust on a flat surface should not exceed 3.2mm (1/8 of an inch). If a dust level of 3.2mm / 1/8th of an inch or greater is identified, then arrangements should be made immediately to reduce the level of dust. This standard is in line with NFPA 664 standard.

7.3.3 While the main priority is to maintain plant cleanliness to below a 1/8th of an inch, any amount of wood dust has the potential to ignite. Where dust is present to a level that obscures the color of the surface below, this should be noted, and measures taken to monitor for any further build-up, with mitigation plans to clean and/or eliminate the dust.

7.4 POTENTIAL SOURCES OF WOOD DUST

7.4.1 In the pelletizing process, once the wood chips are dried < 25% moisture and reduced in size to where wood dust will be present within the product, and up to the point where the pellets leave the out-loading silos. Under normal operating conditions, wood dust is contained within the process equipment, e.g., hammer mills, pellet presses, silos, truck dumps, enclosed conveyors etc.

7.4.2 With the exception of dust created through maintenance, dust that accumulates within the dry end of the pelletizing process is likely caused by, leaks from inspection doors, covers, seals, joints between equipment and holes in pipes and casings.

7.5 ACTION TO BE TAKEN TO STOP DUST LEAKS

7.5.1 Where leaks or an accumulation of dust is identified, action must be taken to stop the leak at the earliest opportunity. In some cases, the necessary action could be as simple as re-securing a pellet sample chute door. This action can be completed safely by the Operator who identified the leak.

7.5.2 Where a leak is due to a defect of the equipment and it is necessary to carry out a repair, a defect card / Work Order should be raised. The person raising the defect card must report the defect to the Shift Operations Supervisor who will assess the extent of the dust leak and assign a suitable priority to the defect card. Consideration should be given to carrying out a temporary repair if applicable.

7.5.3 If the equipment defect is allowing dust to leak to such an extent that it is likely that routine cleaning of the dust will not maintain dust build-up at an acceptable level, an assessment should be performed, and a determination made as to whether the equipment should be shut down. The Operations Supervisor or Operations Manager will make this decision.

7.6 SOURCES OF IGNITION

7.6.1 In addition to ensuring that the build-up of wood dust is effectively controlled to minimize the possibility of fire, deflagration or explosion occurring, it is equally important to ensure that sources of ignition are not able to come into contact with wood dust.

7.6.2 Routine operational inspections shall include monitoring for excessive heat. Wood dust exposed to a temperature of 428F (225'C) is likely to combust. Exterior surfaces of heated process equipment that contact wood or have the potential to contact wood, shall not exceed a maximum allowable temperature of 550F (260'C). The equipment inspection operating procedure will detail the equipment to be checked and trigger temperatures that would drive corrective action.

7.6.3 Potential ignition source and control measures:

Ignition Source	Control Measures
Hot work activities	Hot Work Procedure
Smoking	No Smoking Policy
Sparks generated from friction (bearings)	Ops temp checks and maintenance
Hot surfaces	Plant design (insulation)
Electrical fault	Maintenance policy
Static electricity	Grounded equipment
Lightning strike	Installed lightning conductors
Furnace naked flame or spark	Plant design – Maintenance Policy

IMPORTANT: Tools and equipment (including portable appliances) used within the Pelletizer building shall be approved for use within a "Class II/Division II Location"—an area that is hazardous due to the presence of combustible dust.

8. METHODS OF HOUSEKEEPING:

8.1 Vacuum Cleaning Method

8.1.1 Cleaning with an **anti-static / Class II, Division 1 vacuum system** (fixed or portable) is safest way to clean away dry wood dust. When using an anti-static vacuum system, it is imperative that only approved grounded vacuum hoses are used to vacuum wood dust.

8.1.2 Using a general-purpose hose to vacuum wood dust is likely to create a significant build-up of static electricity in the hose. This static electricity could produce a spark with sufficient energy to ignite that wood dust within the hose.

8.1.3 The vacuum cleaning method creates a minimum amount of airborne dust and therefore the risk of fire, deflagration or explosion is reduced. The amount of dust the operator is exposed to is kept to a minimum.

8.1.4 Vacuum Trucks shall be grounded and bonded.

8.1.5 Vacuum Truck hoses and couplings shall be static dissipative or conductive and grounded.

8.2 Sweeping, Shoveling, Scoop, and Brush Method

8.2.1 The use of scoops, brooms, and brushes for sweeping and shoveling shall be permitted.

8.2.2 With manual cleaning, such as using a scoop and brush, generating a dust cloud should be avoided. Where appropriate for the specific commodity, the use of natural bristle brushes should be considered to reduce the risk of static sparking.

8.3 Water Washing

Water washing can be a very effective means of cleaning accumulations of wood dust from equipment and working areas, particularly outdoors. However, water washing can introduce hazards and cause environmental harm. Depending on the extent of dust build-up and the way in which the water jet is used when cleaning, it is possible for the jet of water to drive dry dust into the atmosphere and create a dust cloud.

NOTE: Only use Fire Hydrants for emergency situations. DO NOT use Fire Hydrants for water washing.

Water washing will result in wet wood dust being dispersed, whether hose washing indoors or outdoors, the wet wood dust will need to be cleaned up and disposed of.

8.4 Cleaning with an Air-Line is prohibited inside an enclosed building.

8.4.1 Cleaning equipment with an air-line can create significant amounts of air borne wood dust, which in turn could create an explosive atmosphere, therefore **cleaning with an air-line is prohibited inside an enclosed building.**

8.4.2 Where blow down using compressed air is used, the following precautions shall be followed:

- All the listed precautions might not be required for limited use of compressed air for cleaning minor accumulations of dust from machines or other surfaces between shifts. A risk assessment should be conducted to

determine which precautions are required for the specific conditions under which compressed air is being used.

- Vacuum cleaning, sweeping, or water wash down methods are used first to clean surfaces that can be safely accessed prior to using compressed air.

- Dust accumulations in the area after vacuum cleaning, sweeping, or water wash down do not exceed the threshold housekeeping dust accumulation.

- Compressed air hoses are equipped with pressure relief nozzles limiting the discharge pressure to 15 psi (207 kPa) in accordance with OSHA requirements in 29 CFR 1910.242(b).

- All electrical equipment potentially exposed to airborne dust in the area meets, at a minimum, NFPA 664, NFPA 70, National Electrical Code; NEMA 12 as defined by NEMA 250; or the equivalent.

- All ignition sources and hot surfaces capable of igniting a dust cloud or dust layer are shut down or removed from the area.

9. EQUIPMENT MAINTENANCE:

9.1 Routine Maintenance

9.1.1 Routine maintenance will be carried out to minimize the possibility of leaks occurring. Shaft seals, door seals and bellows are all potential sources of dust leaks should they wear or fail. Where operational experience identifies any equipment that could be susceptible to erosion and leakage, e.g., pipes and ducting, programs will be established to inspect such items so that replacements parts can be fitted before equipment fails.

9.1.2 Failure of rotating equipment, e.g., bearings, drums, motors, and fans are likely to generate excessive heat and potentially sparks. Routine maintenance shall be carried on all equipment on all rotating equipment.

9.1.3 Bearings that are directly exposed to a combustible dust atmosphere or that are subject to dust accumulation, either of which poses a dust ignition hazard, shall be monitored for overheating.

9.1.4 Fire detection and protection systems shall be maintained in accordance with manufactures recommendations.

9.2 Reactive Maintenance

9.2.1 Reactive maintenance procedures will utilize a prioritization system to ensure that defects that are allowing dust to leak from the process are repaired within appropriate timescales.

9.2.2 In addition to ensuring that the build-up of wood dust is effectively controlled to minimize the possibility of fire, deflagration or explosion occurring, it is equally important to ensure that sources of ignition are not able to come in contact with wood dust.

10. INSPECTION & AUDIT:

10.1 Frequency:

Type	Frequency	Owner
Site Dust Score Card	Weekly	Site Leadership
Dust Sore Audit	Quarterly	Regional Safety
Dust Hazard Assessment	Every Five Years	DHA Team

10.2 Dust Score Card:

The dust measurement audit that is used by Drax to determine the permissible layer depth and a percentage of the footprint area of the room or building. When they are separated, the separate accumulations are combined and compared to the permissible dust accumulation. Surfaces where dust could settle include floors, beam flanges, piping, ductwork, equipment, pellet mills, motors, piping, rotating shafts, suspended ceilings, light fixtures and walls. Particular attention should be given to dust around rotating shifts and hot surfaces such as the furnace.

10.3 Dust Hazard Assessment (DHA):

Hazard assessments will be conducted in accordance with NFPA 652 Standards.

- A DHA will be conducted for all new processes and facility compartments.
- The DHA shall be reviewed and updated at least every 5 years.
- The DHA shall evaluate the fire, deflagration, and explosion hazards and provide recommendations to manage the hazards.

11. REVISION HISTORY:

Originated By:	A. Bouska	Date:	May 2019		
Revised By:	A. Bouska	Date:	May 2020	Reason:	FY 2020 Annual Review
Revised By:	B. Sanders	Date:	February 2022	Reason:	IMS Integration Review