**Note: This workbook is provided as one optional method of collecting data for the WPAC Combustible Dust Audit. In case of discrepancy between this document and the official audit tool, the official audit tool shall prevail.**

## Observations

As part of the audit process, auditors will complete various “general” and “targeted” inspections / observations to help assess the facility’s activities and conditions, and to determine the level/degree of program implementation and effectiveness.

Any critical or high risk dust condition that is identified during the observation process will be immediately brought to the attention of senior management of the facility. The auditor expectation is that this condition is identified and a plan to address the situation has been discussed before the audit concludes. If identified, high risk conditions (and their resolution) will be discussed in the post audit meeting.

# Audit Questions and Guidelines

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| Program  |

No observations in this section

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| Education/Training/Communication  |

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| 2.1 | Do the indoctrination, education and training programs include information on Combustible Wood Dust? | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** | **0-5** | **0-5** | **/20** |
| O - The Auditor must determine if the training being provided is adequate for the hazards and risks associated with combustible wood dust in the Facility. Observe the workforce for compliance to established SWPs, which may include the following items:* Identification of combustible wood dust (have employees correctly identified hazardous combustible wood dust conditions). If hazardous conditions exist and there are no corresponding reports this is a negative observation.
* Correct housekeeping procedures. (If employees and/or contractors are not following the established procedures this is a negative observation).
* Risk assessments prior to cleaning up an area.
* Correct ‘Hot Work’ procedures (i.e. NFPA -51B)
* Correct pressurized air clean up procedures
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| Audit Note from previous page:  |
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| Hazard and Risk Assessment Process  |

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| 3.1 | Has the Facility correctly identified areas where combustible wood dust conditions and potential ignition sources exist? | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-15** | **0-5** |  | **/20** |
| O - The Auditor must verify that the hazard assessment takes into consideration all areas of the Facility where combustible wood dust accumulations can occur including concealed spaces.Items to consider are:* Concealed spaces such as attics, false ceilings, crawl spaces, inside duct work.
* All buildings and areas whether they are in use or not.
* Silos and fibre storage areas.
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| 3.3 | Has the Facility categorized the combustible wood dust hazard? | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-15** | **0-5** |  | **/20** |
| O - The Auditor must verify that the risks associated with combustible wood dust hazards in the Facility have been correctly identified.Some items to consider are:* Type of wood dust present.
* Dispersion of combustible wood dust.
* Rate of Accumulation
* Inclusion of electrical equipment.
* Inclusion of ‘Hot Work’ designated areas.
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| Controls |

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| 4.2 | Has the facility implemented housekeeping controls for combustible wood dust hazards? | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** | **0-10** | **0-10** | **/30** |
| Observe if the primary method of dust cleanup is acceptable (as determined from time to time by WPAC) and effective.Observe the facility Housekeeping over time to determine if the established standards are being met (average < 1/8” over 5% of the area). Areas to consider include:

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| * Hydraulic Units
* Basements
* Conveyors (head & tail spools).
* Horizontal Surfaces
* Ducts
* Pipes
* Motors/Drive units
* Unused Buildings
 | * Hoods
* Beams
* Ledges
* Suspended Ceilings
* Behind Switch Gear
* Electrical Rooms
* Mobile Equipment
* Office Areas
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Note: ALL areas of the operation (i.e. all areas of the property) must be assessed for dust accumulations |
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| 4.3 | Are primary machine centres managed for dust accumulation and ignition sources? | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** |  |  | **/5** |
| Are passive containment controls in place (and are effective) at major machine centres (pelletizers, hammer mills, dryers, packagers, etc.) such as:Is debris diverted away from potential ignition sources such as high speed bearings and electrical motors?Are non-combustible partitions, buildings, rooms or other type of enclosures provided to prevent wood dust from drifting into other areas? |
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| 4.4 | **Are conveyors managed to reduce hazards?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** |  |  | **/5** |
| Observe the conveyors for:* Slides, baffles or ramps at transfer points to guide material (to minimize drops).
* Speed of the conveyor (move material at a controlled speed).
* Enclosed conveyors that have a potential for high dust concentration been identified and proper controls implemented for the hazards such as a dust collection system or mister.
* Belt scrapers provided on conveyors at the tail spools or other location or other devices to prevent spillage or buildup that could cause the conveyor to malfunction.
* Conductive belting for dry material (planer shavings, sawdust, etc.).
* Effective magnetic separation and/or other metal detection process at the in-feed to any process (fractionating equipment – hammer mill, hogger).
* Rock drops and/or other means of removing non-ferrous contaminants are present.
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| 4.5 | **Are construction features present to reduce the risk of fire and explosion?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** |  |  | **/10** |
| Observe the buildings for:* Building design features that utilized/ incorporated to complement housekeeping and reduce dust accumulations.
* Rooms and buildings with potential for combustible dust explosion been correctly identified and controlled? Examples could include chipper, screener, hog, pelletizer or packager enclosures.
* Interior surfaces of the building designed to facilitate cleaning (high gloss paint, enclosed walls).
* Structural steel members with ledges and horizontal surfaces boxed in or enclosed.
* Enclosed areas fully sealed to prevent dust from entering the enclosure.
* Windows, ledges, girders, beams and other horizontal surfaces including light fixtures provided with sharply sloped surfaces (40º—60º) to minimize dust deposits.
* Primary manufacturing buildings are of non-combustible construction
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| 4.6 | **Are misting / fogging systems present and operational?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** | **0-5** |  | **/10** |
| The question is not applicable if there is no misting system in the design Observe the misting systems for:* Impacts of the water mist on surrounding areas and equipment.
* Effects on the ventilation systems (caking, fouling).
* Operation during winter months.
* Exposure to workers (potable water).
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| 4.7 | **Are pneumatic conveyance systems managed effectively?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** |  |  | **/10** |
| Observe the pneumatic conveyance systems for:1. Appropriate enclosures to contain dust.
2. Effectiveness of the system.
3. Location of the equipment located outside away from buildings where applicable
4. Separate ventilation system for the removal of welding or maintenance shop air to ensure sparks are not collected by a system conveying wood dust.
5. Location of explosion venting to ensure employee safety.
6. Spark detection,
7. Abort gates,
8. Deluge system,
9. Explosion vents
10. Backdraft dampers
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| 4.8 | **Are bag houses and / or cyclones managed effectively?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-7** | **0-2** | **0,1** | **/10** |
| Observe Bag Houses and/ or cyclones for:* Protection Equipment (sprinkler protection, heat/spark detection, abort gates).
* Deflagration Venting/Isolation (explosion venting).
* Preventative Maintenance (for deflagration Venting).
* Correct labelling of hazards (explosion vents).
* Correct directing of vents (away from doors or outside operating areas)
* Grounding of Equipment
* Duct from the cooler to the bag house / cyclone contains a high speed abort gate.

Are cyclones or bag house type collectors that are connected to process equipment with a potential to produce sparks or embers;* Equipped with an approved spark detection system
* Equipped with an approved sprinkler system both above and below the collector bags
* Equipped with a high-speed abort gate
* Provided with counterweighted back draft dampers on in-feed duct work
* Provided with explosion-relief panels directed away from buildings where personnel congregate
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| 4.9 | **Are storage silos and bucket elevators managed effectively** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** | **0-5** |  | **/10** |
| Observe storage silos and bucket elevators for:* Explosion Venting
* Grounding
* Sprinklers (or quick connects)
* Temperature Monitoring
* Electrical monitoring for belt slippage/rotation/belt alignment (with interlocks of system).
* Silos are all located outside of manufacturing building and provided with a clear space of at least 10m on all sides for firefighting efforts.
* Explosion-relief venting at the top of the silos that is directed away from buildings or where personnel congregate.
* Cold air intake
* Abort system on pellet input
* A clear display in the control room indicating temperature of the silo that will both audibly and visually alert the operator and automatically stop the process in-feed to each affected silo (for all silos),
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| 4.10 | **Are electrical systems managed effectively** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** | **0-10** |  | **/20** |
| Observe Electrical Systems for:* Accumulations of combustible wood dust inside switch gear. **(Safety Note – observation will require arc flash precautions)**
* Accumulations of combustible wood dust inside electrical rooms.
* Positive pressure for switch gear enclosures and electrical rooms (with clean outside air).
* Electrical rooms are separated from the main manufacturing area
	+ The separation is a 2 hour fire rated enclosure on all walls, floor, ceiling and self-closing doors as applicable, (provided that no electrical room door was found to be blocked or left open).
* Electrical wiring, fittings and other devices are properly sealed and maintained (i.e. no open electrical boxes, no connections outside of junction boxes, no frayed wires, no portable heaters in manufacturing areas, etc.).
* Programmable logic controllers (PLC) are used for operations and monitoring.
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| 4.11 | **Are fibre piles managed effectively?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** |  |  | **/5** |
| Observe for:* All raw fibre (shavings, hog fuel, sawdust, logs or other wood) is stored in piles or a building, structure or silo that is 30m or more away from all other major buildings and does not impede emergency access to the site.
* Fibre piles are less than 150m long, 100m wide and 20m tall.
* All raw material bins, piles, structures or silos separated by a distance of not less than 10m.
* Buildings and silos used for dry fibre storage are equipped with automatic sprinkler or other fire suppression system.
* Volume, size, cover and location conform to regulation and permits.
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| 4.12 | **Is mobile equipment managed effectively?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-5** |  |  | **/5** |
| Observe for:* Mobile equipment used to transport raw fibre that is equipped with fire suppression systems.
* Accumulations of dust inside mobile equipment moving parts and on hot surfaces.
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| 4.13 | **Are fire systems effective?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** |  |  | **/10** |
| Observe for:* All primary and support buildings are sprinkler protected.
* Fire hose stations are provided throughout the interior of production buildings.
* Fire hydrants (private or municipal) spaced not less than 100m apart and 100m from manufacturing buildings, storage silos and fire storage piles.
* Fire pumps are approved (UL or FM) pumps with either dual system (electric driver and diesel driver) or electric with an on-site diesel generator to provide a backup power supply. (Fire pumps are required for private water supplies or where specified by the qualified engineer who provided the water supply volume calculation.)
* A fire dump or other safe area provided for the purging of dryer contents if high temperature limit switches are exceeded. (The area must be a location where pedestrians are excluded by physical design (elevation, barriers, etc.) or by administrative controls (signage).)
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| 4.15 | **Is the backup generator effective?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** |  |  | **/10** |
| Observe for:* A backup generator or independent power source must exist for 2 points
* The generator must be able to maintain the drum rotation drive if a drum dryer is used for 4 points. Not applicable if there is no drum dryer.
* The generator must be able to supply air and power to the cooler(s) if air supplied coolers are used. Not applicable if there are not air supplied coolers.
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| 4.16 | **Is fibre sizing equipment effectively managed?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** |  |  | **/10** |
| Observe for:* The fractionating equipment is either located outside the main manufacturing facility, or Isolated in a 2 hour fire enclosure within the main plant.
* The equipment AND the ductwork leading from the equipment has explosion-relieving panels that vent to the exterior of the building in an area or location where pedestrians are excluded by physical design (elevation, barriers, etc.) or by administrative controls (signage).
* Rock traps and magnets
* Spark detection and abort systems
* Fire suppression (at the post hammer mill duct work or conveyor system)
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| 4.17 | **Is the fibre drying system managed effectively?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** | **0-5** | **0-5** | **/20** |
| Observe for:Fibre drying abort gate location to minimize risk to employees or of firesSpark detectionFire suppressionTemperature monitoring |
| Audit Note:  |
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| 4.18 | **Is pelletizing equipment effectively managed?** | **O** | **D** | **I** | **Total** |
|  |  |  | **0** |
| **0-10** | **0-5** |  | **/15** |
| Observe for:* A reserve hopper for either each press or for all presses equipped with both high and low level material sensors.
* Automated lubrication systems or PM schedule
* Magnets on the infeed for foreign materials
* Spark detection between the pelletizer and cooler
* Isolation or abort systems
* Temperature monitoring
* All coolers vent to atmosphere outside the building (or to a cyclone) in a safe location. (The system must not capture residual heat for use anywhere else in the process or for seasonal heating.)
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| Audit Note:  |
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