

# The 4DS Approach

– to formulating a comprehensive Fugitive  
Dust Control Management Strategy



Controlling dust in industries in developed nations is considered to be an integral part of the plant operation, whereas in the developing nations it is unfortunately a 'peripheral' activity, and an 'ornamental' investment.

This is a 'traditional' mindset, which is seeing some change in the developing nation industries i.e. at the intent level, but needs to see some 'real change' through a far greater focus in capping the dust nuisance through a committed and a comprehensive Dust Management Policy, implemented at the ground level.

Much as the Dust Management Policy would have to be formulated for and by the particular plant, and would be unique from another, the constant's would be the formation of a Dust Control Task Force and to work upon and address the 4 (four) broad Dust Sources ;

**#1**

Ineffective upkeep and maintenance of  
**DUST CONTROL SYSTEMS**  
in MHP's

**#2**

Technological inadequacies and / or inherent design  
**INADEQUACIES OF MHP'S**  
which result in dust leakage / puffing

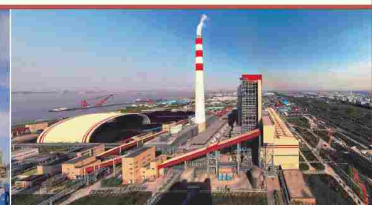
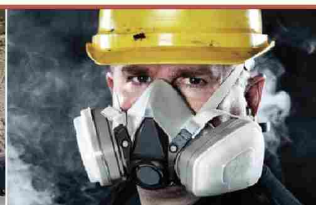
**#3**

Inadequacies in  
**MAINTENANCE** of dust producing equipment, processes or area

**#4**

Improvement in  
**HOUSEKEEPING** and maintenance practices

Statistically, dust control systems take care of only 25% of the problem, whereas the balance lies with the plant design and it's daily practices. But, ironically there is a commonly misplaced expectation that installation of dust control systems would ensure the plant to be totally dust free, being largely oblivious to the existing 75% of the problem which is inherent to the plant. Further, it is often observed that within the primary 25% the attention towards the upkeep of the dust control system is so low that this defense mechanism too, is practically non-existent, rendering the plant to not have any defense mechanism at all.



# *The Urgent Need for a Dust Control Task Force*

*- to meet the norms*

Despite the intent, sometimes the results are not achieved, as simple external efforts do not work in eradicating any nuisance. This needs an involvement and commitment across all levels, lead by a dedicated Task Force with a constant single point agenda to address and plug the 4 Dust Sources, through formulation and implementation of a plan against each of the problems identified within each of the 4 Dust Sources.

Though this may even sound similar to many existing set ups to tackle the dust nuisance or air pollution in general, the reason why some plants still have a dust nuisance issue is because mostly these responsibilities are 'lumped' with the Maintenance Departments who not wrongly so, give priority to those equipments and systems mainly which are production related, and activities which reduce downtime and losses, and mean money in no uncertain terms.

It is from this dilemma between 'plant profitability and statutory compliances' that the maintenance of dust control systems is termed as maintaining an 'ornamental' item, which is considered to not deliver an ounce of production ! This is where the transition from a 'traditional' outlook to one with a 'broader outlook' is to be made, and can be done so through the infusion of a dedicated task force.

This should however not be confused with the Environmental Department which are seen to be mostly engaged in data compilation and monitoring air, water and sound levels all across the plant.

It is expected that the Dust Control Task Force would be 'getting it's hands dirty' on a daily basis and contributing to the Safety, Health & Environment Policy with their ground monitoring, and getting things done directly through a trained and dedicated work force, which could be an extension of the maintenance department or any other way which the company deems fit. But, ensuring that the problems do not keep hanging, and the ghost of the 'priority' approach of the maintenance crew stops haunting in addressing the complete nuisance of dust.



# Implementation of the Dust Control Task Force



**#1**

*Appointing a  
Dust Control Officer  
with a Task Force*



**#2**

*Identifying and Addressing  
ALL Dust Sources  
- 4 Broad Dust Sources*



**#3**

*Making the Dust Control Task Force a  
Customer of the Maintenance  
Department to get the job completed*



**#4**

*Dust Control Officer to report directly to  
CEO*

# Result of not adopting the '4DS' Approach



***NON COMPLIANCE*** of NAAQS,  
***Industry Emissions & Factories Act***

# Understanding the '4DS' Approach

#1A



## Ineffective upkeep and maintenance of dust control systems in MHP's - **Dust Suppression Systems**

The effectiveness of a Dust Control System is only known through its use and a commitment to maintain it, operate it and report any such issues faced. But, quite often the facts of its effectiveness is hidden by poor maintenance of the Dust Control Systems . Here are a few examples ;



Nozzles choked with material, not cleaned (as circled)



Spray Panel almost buried !

Fogging Panel for generating Fog to control dust nuisance fully clogged with material and with no panel door.



No respect for **Dust Control Systems** !

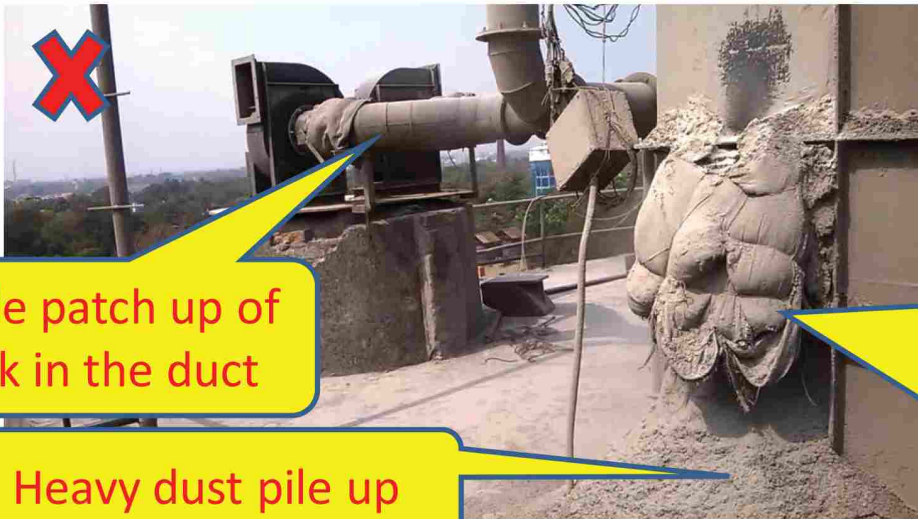
# Understanding the '4DS' Approach

## Ineffective upkeep and maintenance of dust control systems in MHP's - **Dust Extraction Systems**

#1B



The effectiveness of a Dust Control System is only known through its use and a commitment to maintain it, operate it and report any such issues faced. But, quite often the facts of its effectiveness is hidden by poor maintenance of the Dust Control Systems . Here are a few examples ;



Crude patch up of leak in the duct

Heavy dust pile up

Heavy Leakage from Inspection Door



Dust leakage during operation

Dust nuisance spreading across the Plant and into the surrounding area



No respect for **Dust Control Systems** !

## Understanding the '4DS' Approach

#2



### Technological inadequacies and / or inherent design inadequacies of MHP's which result in dust leakage / puffing

Incomplete technological equipment / accessories and / or inherent design inadequacies resulting in ineffective containment causing consistent dust leakage / puffing and consistent increase in dust concentration. To be addressed with the proposed incorporations ;

- Ensure **optimum height of fall** based on material dustiness properties to avoid impact and uncontrollable dust nuisance at receipt point
- Universal pad for **impact absorption** at Receipt Point
- **Adequate skirt length and height** to contain the dust for belt conveyor applications
- Well thought out and adequate **self containment arrangements for applications other than belt conveyors**
- **Proper ventilation in the building / house**, otherwise affecting adequate number of air changes and to avoid build up of dust concentration therein.
- Effect of cross wind blowing through the building / house to be minimized through effective containment to avoid carrying dust to other areas causing increase in dust levels in the uncontaminated areas.

Excessive height of fall



Cross wind blowing through the building



Inadequate Skirt height



# Understanding the '4DS' Approach

## Inadequacies in maintenance of dust producing equipment, processes or area

#3



- Leakage from **skirt sealings & spillage** due to improper belt alignment
- Leakage of dust due to **holes or cracks in chutes**
- **Broken / missing inspection doors and clamps** thereof resulting in openings for dust leakage.
- Identification of **non moving idlers** and it's removal and replacement of the same.
- Inspection and **adjustment of all belt conveyor** and their **skirting rubber** and **dust seals**
- **Improper / incomplete boxing up** of the equipment and accessories after any maintenance work.
- **Grated flooring / holes in the flooring** causing dust contamination, increase in dust levels in the lower floor level and dust accumulation etc.



Missing  
Inspection  
Door

Grated flooring  
causing pile up  
below



Opening /  
Crack in  
Chute



Openings below the  
Screen



Discharge  
Hood not  
boxed  
back



## The Causes.....

- Allowing **dust accumulations** and delay in clean up of the same
- Cleaning with **brooms and shovels** prompting subsequent dust generation in the building / house,
- **Irregular cleaning** and washing of the floors failing to keep it void of spilled over dust and it's build up over time etc.

Dust  
Accumulation  
caused in the  
**outside** area



Irregular cleaning of  
floors causing dust build  
up **inside** the building



# Primary Challenges in tackling *Dust Control*

- Overall, Air Pollution not taken seriously
- More attention towards Green House Gases (GHG's) & Stack Emissions
- Least attention towards improvement in Work Area Hygiene at the ground level
- Low priority to Particulate Matter (PM)- an Air Pollutant most visible , causing maximum nuisance affecting the ambient air quality, which is ignored and taken for granted
- Incomplete understanding of the emission and personal exposure level norms, and application of the same as laid out in Technical Specifications, resulting in misplaced expectations that Dust Control Systems alone shall take care of all dust nuisance problems and deliver the norms too.
- Dust nuisance and it's control is mostly not conceived and not considered as a priority , or as an integral part of operating the Plant
- Prevalence of low awareness levels in appreciating that multiple control measures need to be in place to achieve the norms through implementation of good engineering and management practices

# *Dust Control* does not end....



with installing a Dust Control System and expecting it to meet Work Zone Emission Norms,

and, neither with monitoring the stack to meet Emission Norms



*Dust Control* is knowing and addressing ALL sources of dust generation



the first step to  
**DUST** control is  
- don't let it out !



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#1 DUST  
CONTROL  
SPECIALISTS

