

Summary of Changes to NEP (issued 3/11)

- 1) The listing of SIC/NAIC (industries which may generate combustible dust), originally a single list in appendix D, has now been divided into two parts: D-1 is a list of “**Industries with More Frequent and/or High Consequence Combustible Dust Explosions/Fires**” Where D-2 is a list of “**Industries that may have Potential for Combustible Dust Explosions/Fires**” In effect, OSHA has gone through and looked at the risks of each industry and prioritized the highest risk industries into the D-1 list, while the lesser risk industries are now in the D-2 list. SIC/NAIC code 4911 (power plants) is the second entry on list D-1. By itself this would be significant; however, in Part IX, section A (inspection scheduling), subsection 4, the number of total required inspections have been **increased from one per year to four per year. Three of these inspections are to come from the D-1 List. This is by far the most important change to the NEP and is aimed squarely at those industries, including coal-fired power plants, that pose the highest risk of serious combustible dust incidents.**
 - 2) In part IX, Section E (Inspection and citation Procedures), subsection 3 d, the wording has changed. Where in the original version of the NEP 1/32” of dust was cited as the actionable level, now “CSHOs should observe areas of the plant for accumulations of hazardous levels of dust (for example, greater than 1/32 of an inch, which is approximately equal to the thickness of a typical paper clip).” In effect, the hazardous levels of dust have been more loosely defined. In subsection 9 (citations) the wording has also changed from identifying 1/32” to “...can create an explosion, deflagration or other fire hazard,...” You can have a flash fire with less than 1/32” of coal dust. Note that we had used NFPA 654 to calculate that the action level for coal dust was about 1/19” of dust thickness. This now changes. Although 1/19” is certainly actionable, being the amount required for a dust explosion, less than 1/19” can now be cited if it poses a risk of flash fire.
- The rest of the changes are not significant:
- 3) The executive summary now indicates that there will be increased enforcement activities related to this NEP. It cites specifically the recent sugar refinery explosion.
 - 4) Food products has been added to the list of industries included in this NEP. This will have little impact on our SAFE program.
 - 5) All references to the Chemical Safety Board have been removed. This will have little impact on our SAFE program.
 - 6) There was some clarification of the random number table-based inspection list. This will have little impact on our SAFE program.

The D-1 list includes **all** power generation, transmission, and distribution facilities. They haven’t even gotten to distinguishing between coal-fired vs. natural gas, let alone gotten to the finer distinction of PRB vs. non-PRB coal. Given that cane and beet sugar refineries are on the D-1 list as well, I am inclined to believe that they will not distinguish between PRB and bituminous coal. After all, remember that they have no data to back up the difference in kst’s between the two coals. Once they run their own tests, maybe they will notice a difference, but until then, coal = coal.

NFPA 654 “Cliff Notes”

NFPA 654 is the meat and potatoes of the combustible dust NEP. It is not (yet!) law. It is; however, a generally recognized standard for the handling of combustible dust. In the pending legislation (HR 5522), NFPA 654 (or NFPA 484 for combustible metal dust) is cited as the minimum standard for protection from combustible dust hazards.

NFPA 654 covers Process and Facility Design, Operation, and Maintenance. The following is a list of highlights as viewed from a power plant perspective, along with where you can find more detail in the standard.

- 1) The first five chapters are general items and have little applicability for an existing operation:
 - a. All parts of design, including inputs, assumptions, and safety factors, shall be documented and archived.
 - b. Design is to be based on a hazard analysis taking into account the possibility of fire or explosion, and shall be adequate to protect life and health, maintain the structural integrity of the facility, allow mission continuity, and prevent the propagation of fire or explosion.
 - c. You must have a written procedure documenting how you manage change (for example a PRB conversion, or a plant upgrade) (chapter 4.3)
- 2) In the next seven chapters, items of particular note:
 - a. Chapter 6: Facility and System Design
 - i. Section 6.1.3: Dust collector exhaust may not be returned to buildings if there is a chance of the presence of combustible gas or vapor, and also unless the filters are at least 99.9% effective against 10 micron particles.
 - ii. Section 6.2.3.2: Spells out the calculation that leads to 1/32” dust thickness for a material with a bulk density of 75 #/ft³. Because other materials have different bulk densities, a better approach is to look at the total dust in grams per square foot. 1/32” over a square foot, at 75#/ft³ calculates out to be 88.6 grams per square foot. This number is material (and bulk density) independent.
 - iii. Section 6.4: Deflagration venting—required where combustible dust hazard exists, can not vent to occupied spaces.
 - iv. Section 6.6: Electrical Equipment; where dust accumulates or is suspended in the air, that area shall be classified.
 - b. Chapter 7: Process Equipment
 - i. Section 7.1.4 & 7.1.5: Where an explosion hazard exists, isolation devices will be installed to prevent propagation of the explosion. These include but are not limited to Chokes, Rotary valves, Automatic fast-acting valves, Flame-front diverters, and Chemical isolation systems.
 - ii. 7.2: Bulk Storage. You can’t put bulk storage inside unless it is properly protected from explosion hazards.
 - iii. 7.2.4: Bulk storage enclosures will be built to facilitate ease of cleaning of interior surfaces.
 - iv. 7.13: Air-material separators (Dust Collectors): You can’t put a dust collector inside unless it is properly protected from explosion hazards,

has appropriately designed deflagration venting to the outside, and vents its exhaust air to the outside, to a restricted area and away from air intakes (unless it complies with 6.1.3 above). However, dust collectors less than 8 ft³ are exempt.

- c. Chapter 8: Housekeeping.
 - i. Operate all equipment in a manner to minimize dust generation.
 - ii. Establish regular cleaning procedures and schedules.
 - iii. When cleaning, minimize the generation of dust
 - iv. No smoking, welding, or hot work when cleaning combustible dust.
 - v. Vacuum cleaners shall be rated for Class II hazardous environments unless flammable gasses or vapors are present, in which case the rating shall be Class I and Class II.
- d. Chapter 9: Ignition sources.
 - i. Remove foreign material such as tramp metal which may cause a spark
 - ii. Belt drives shall not slip.
 - iii. Control frictional heating on bearings and bushings
 - iv. Keep moving parts aligned to minimize friction
 - v. Ground all equipment
 - vi. All system components such as ducts, belts, etc., shall be conductive (unless this is not possible or can be proven safe).
 - vii. Hot work policy and permits
 - viii. Smoking in designated areas only, posted.
 - ix. Industrial trucks shall be approved for work in the electrical classification of the area where work is to be performed.
- e. Chapter 10: Fire Protection
 - i. Fire extinguisher training will include how to NOT generate a dust cloud while extinguishing a fire
 - ii. Portable spray nozzles for use in areas containing dust shall be rated for class C (Electrical) fires
- f. Chapter 11: Training and Procedures (Document, document, document!)
 - i. Operating, maintenance, and emergency plans shall be developed
 - ii. These plans will be reviewed annually
 - iii. Training will insure that all employees are knowledgeable about hazards, processes, equipment operation, maintenance, and housekeeping procedures.
 - iv. Refresher training must be documented annually.
- g. Chapter 12: Inspection and maintenance
 - i. Program requirements include inspection, testing, and maintenance of
 - 1. Fire and explosion protection equipment
 - 2. Dust control Equipment
 - 3. Housekeeping
 - 4. Potential Ignition sources
 - 5. Electrical, process, and mechanical equipment, including process interlocks.

Courtesy of...



6. Process changes
 7. Lubrication of bearings.
- i. Records of all maintenance and repairs shall be kept.