Public Comment No. 6-NFPA 61-2018 [Sections 1.3, 1.4]

Sections 1.3, 1.4

1.3 Application.

1.3.1*

This standard shall apply to all of the following:

(1) All facilities that receive, handle, process, dry, blend, use, mill, package, store, or ship dry agricultural bulk materials, their by-products, or dusts that include grains, oilseeds, agricultural seeds, legumes, sugar, flour, spices, feeds, dry dairy/food powders, and other related materials

(2) All facilities designed for manufacturing and handling starch, including drying, grinding, conveying, processing, packaging, and storing dry or modified starch, and dry products and dusts generated from these processes

(3) Those seed preparation and meal-handling systems of oilseed processing plants not covered by NFPA 36

1.3.2

This standard shall not apply to oilseed extraction processes that are covered by NFPA 36.

1.4* Conflicts.

1.4.1

Where a requirement specified in this industry-specific standard differs from a requirement specified in NFPA 652, the requirement in this standard shall be permitted to be used instead.

1.4.2

Where a requirement specified in this standard specifically prohibits a requirement specified in NFPA 652, the prohibition in this standard shall be permitted.

1.4.3

The requirements of this standard shall be applied or construed so as not to create an unreasonable risk to public food safety.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_3.pdf	61 CC Note No. 3	

Statement of Problem and Substantiation for Public Comment

Revise the application and conflicts sections of the document to correlate with NFPA 654 and 652:

1.4 Application.

1.4.1

This standard shall be used to supplement the requirements established by NFPA 652.

1.5 Conflicts.

1.5.1

Where a requirement specified in this industry-specific standard differs from a requirement specified in NFPA 652, the requirement in this standard shall be permitted to be used.

1.5.2

Where a requirement specified in this standard specifically prohibits a requirement specified in NFPA 652, the prohibition in this standard shall apply.

Related Item

• CC Note No. 3

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:24:05 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee disagrees with the use of the term "supplemental" when describing the relationship between NFPA 652 and NFPA 61. The Technical Committee has worked to provide requirements in NFPA 61 so that it can be used as a standalone document for this industry and the language currently in Chapter 1 and A.1.4 conveys this. The proposed language does not add value or clarity over what is already in the chapter.

Correlating Committee Note No. 3-NFPA 61-2018 [Sections 1.3, 1.4]

Submitter Information Verification

Committee:

Submittal Date: Thu Jul 12 14:32:30 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: Revise the application and conflicts sections of the document to correlate with NFPA 654 and 652:

1.4 Application.

1.4.1

This standard shall be used to supplement the requirements established by NFPA 652.

1.5 Conflicts.

1.5.1

Where a requirement specified in this industry-specific standard differs from a requirement specified in NFPA 652, the requirement in this standard shall be permitted to be used.

1.5.2

Where a requirement specified in this standard specifically prohibits a requirement specified in NFPA 652, the prohibition in this standard shall apply.

Ballot Results

✔ **This item has passed ballot**

15 Eligible Voters
2 Not Returned
9 Affirmative All
1 Affirmative with Comments
3 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Affirmative with Comment

Frank, Walter L.

We really need to establish what granularity we associate with the term "requirement." If, for example, section 8.2 in 652 deals with Housekeeping, and section 8.4 in 61 deals with Housekeeping, does all of 8.4 in 61 trump all of 8.2 in 654? Or, do we compare/contrast the individual 8.2.x items in 654 with the 8.4.x items in 61?

Negative with Comment

Aiken, Chris

Support the note for the conflict section 1.5 but do not agree with the addition of 1.4.1 and specifically the word supplement. Supplement implies that the end user must purchase both standards. Previous committee discussions supported that industry specific standards may elect to align with 652 in structure so the end user may purchase just the industry specific standard. This change would mean that the end user needs to purchase multiple consensus standards and then interpret these different standards to identify and resolve conflicts. Increasing the complexity does not help the end user’s ability to safely design, operate or maintain processes with combustible dust.

Bujewski, Matthew J.

A change is not necessary. The current wording is acceptable.

Gombar, Robert C.

I agree with Chris Aiken's position.

Public Comment No. 13-NFPA 61-2018 [Section No. 1.4.1]

1.4.1

Where a requirement specified in this industry-specific standard differs from a requirement specified in NFPA 652, the requirement in this standard shall be permitted to be used instead.

Statement of Problem and Substantiation for Public Comment

The National Grain and Association opposes the Correlating Committee's recommended revisions to Section 1.4.1. By making NFPA 61 a "supplement" to NFPA 652, it implies that 652 takes precedence over NFPA 61. The NFPA 61 committee has worked diligently to coordinate the 61 standard with 652 over the past several years. This new proposal suggests that the user will need to purchase both 61 and 652. The intent of 61 is to address industry specific issues not addressed in 652. Overall, the suggested change will make it more complex for the end user.

Related Item

• CN

Submitter Information Verification

Submitter Full Name: Jess McCluer
Organization: National Grain and Feed Association
Street Address:
City:
State:
Zip:
Submittal Date: Thu Nov 15 16:34:48 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected
Resolution: The Technical Committee agrees with the submitters and has not made the revision recommended by the Correlating Committee. The response is "Reject" rather than "Accept" because no text changes have been proposed.

Public Comment No. 4-NFPA 61-2018 [Section No. 1.4.1]

1.4.1

Where a requirement specified in this industry-specific standard differs from a requirement specified in NFPA 652, the requirement in this standard shall be permitted to be used instead.

Statement of Problem and Substantiation for Public Comment

The United States Beet Sugar Association ("USBSA") views the Correlating Committee's recommended revision to add a new Section 1.4.1 as a back-door way of undermining the independence of the NFPA 61 standard. Therefore, the USBSA strongly opposes adding new Section 1.4.1 to NFPA 61. The Committee has worked very hard to align the requirements of NFPA 61 with the requirements of NFPA 652 so that Agricultural/Food Processing users only need to purchase and rely on NFPA 61. By making NFPA 61 a "supplement" to the requirements of NFPA 652 essentially makes it necessary for the users to purchase both NFPA 61 and NFPA 652 and then compare the two standards to identify and resolve conflicting requirements. This unnecessary complexity does nothing to improve safety because it undermines the users' ability to appropriately design, operate, maintain, and manage processes with combustible dust.

Related Item

• CC Note 3

Submitter Information Verification

Submitter Full Name: Arthur Sapper
Organization: Ogletree Deakins
Affiliation: United States Beet Sugar Association
Street Address:
City:
State:
Zip:
Submittal Date: Mon Nov 12 16:11:38 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected

Resolution: The Technical Committee agrees with the submitters and has not made the revision recommended by the Correlating Committee. The response is "Reject" rather than "Accept" because no text changes have been proposed.

Public Comment No. 2-NFPA 61-2018 [Section No. 3.3.28]

3.3.28* Pneumatic Conveying System.

A material feeder, an air-material separator, an enclosed ductwork system, or an air-moving device in which a combustible particulate solid is conveyed from one ~~point~~ bin to another with a stream of air or other gases. Pneumatic conveying for product transfer is distinguished from dust collection systems that are designed to handle dust.

Statement of Problem and Substantiation for Public Comment

Pneumatic conveying is almost always from one bin (or tank, silo, container, etc). The bins are an integral part of the system and should be included in the definition to avoid confusion.

Related Item

• committee member input for definition 3.3.28

Submitter Information Verification

Submitter Full Name: William Kearns
Organization: Fred D. Pfening Company
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 06 11:30:52 EDT 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-5-NFPA 61-2019
Statement: A point is a mathematical concept with no dimensions, so changing the terminology from "point" to "location" better clarifies the committees intent.

Public Comment No. 1-NFPA 61-2018 [Section No. 8.3.2]

8.3.2* Conveyors, Spouts, and Throws of Material.

8.3.2.1*

Bulk material conveyor belts shall be designed to either relieve or stop if the discharge end becomes plugged.

8.3.2.2

Bulk material conveyor belts shall have belt alignment and hot bearing sensors at the head and tail.

8.3.2.3

Screw, drag, or en-masse conveyors shall be fully enclosed in metal housings and shall be designed to either relieve or stop if the discharge end becomes plugged.

8.3.2.4*

Bulk material conveyor belts and lagging shall have a surface resistivity not greater than 300 megohms per square and shall be fire resistant and oil resistant.

8.3.2.4.1

Belts shall be fire resistant by complying with the requirements of the Mine Safety and Health Administration (MSHA) 2G flame test for conveyor belting in 30 CFR 18, Section 18.65.

8.3.2.5

Fixed spouts shall be dusttight.

8.3.2.6*

Use of combustible lining shall be permitted in spouts and other handling equipment at impact points and on wear surfaces.

8.3.2.7

Portable, automatic distributing, and movable spouts shall be permitted in work areas, bin areas, and distribution areas and shall be as dusttight as practicable when in use.

8.3.2.8*

Spouts that direct material into bins, tanks, or silos shall be designed and installed so that any foreign objects, such as metal or stones, in the material stream do not strike the walls of the container, as far as is practicable.

I would like to see enclosed belt conveyors addressed specifically. They are a large net positive for reducing fugitive dust emmissions and reducing dust buildup in structures, but a literal interpretation of the standard implies that expensive venting or suppression needs to be included, as their internal volume typically exceeds 8 cubic feet. My concern is that the requirement will push users to use open conveyor belts as a less expensive option, which makes explosions much more likely.

Statement of Problem and Substantiation for Public Comment

Enclosed belt conveyors are extremely common in the grain handling industry. NFPA 61 implies that they should have additional safeguards such as venting or suppression, but that is impractical. I think the standard should address it directly.

Related Item

• First Draft Report

Submitter Information Verification

Submitter Full Name: Bob Klare
Organization: EDG, Inc.
Affiliation: General grain industry clients

Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 04 17:41:05 EDT 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but held

Resolution: NFPA 61 does not imply or require venting or suppression systems for enclosed belt conveyors. The committee agrees that specific requirements for enclosed belt conveyors should be considered but they cannot be added at this stage in the cycle. The submitter is encouraged to provide specific text as Public Input for the next edition.

Public Comment No. 5-NFPA 61-2018 [Section No. 8.3.2.4]

8.3.2.4*

Bulk material conveyor belts and lagging shall have a surface resistivity not greater than 300 megohms per square and shall be fire resistant and oil resistant.

8.3.2.4.1

Belts shall be fire resistant by complying with the requirements of the Mine Safety and Health Administration (MSHA) 2G flame test for conveyor belting in 30 CFR 18, Section 18.65.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_1.pdf	61 CC Note No. 1	

Statement of Problem and Substantiation for Public Comment

The Technical Committee should add annex material providing the source material justifying this change.

Related Item

• FR No. 2

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:21:59 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-12-NFPA 61-2019
Statement: Annex material has been added to provide the source material justifying the change made to 8.3.2.4 and 8.3.7.1.10 at the First Draft.

Correlating Committee Note No. 1-NFPA 61-2018 [Section No. 8.3.2.4]

Submitter Information Verification

Committee:

Submittal Date: Tue Jun 26 12:30:36 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Technical Committee should add annex material providing the source material justifying this change.

Committee Notes:

Date	Submitted By	
Jun 26, 2018	Laura Moreno	The NFPA 61 committee had a powerpoint presentation from the task group that contained additional information.

FR-2-NFPA 61-2018

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
12 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Bujewski, Matthew J.

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Frank, Walter L.

Gombar, Robert C.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Negative with Comment

Aiken, Chris

This note is requesting a technical committee to justify a technical decision with no reference to a correlation issue. The correlation committee should not require all the standards under its oversight to justify changes in the annex.

Public Comment No. 8-NFPA 61-2018 [Section No. 8.3.3.2.4]

8.3.3.2.4*

Ingredient transport system installations whose sole function is to transfer ingredients shall be permitted to be installed inside of a building without explosion protection where all of the following requirements are met:

(1) The system is a negative or positive pressure pneumatic conveying system.

(2) The system, through its design, is isolated from the addition of mechanical or electrical energy and process activities, such as cooking or drying, by positive means, such as rotary valves, filters, normally closed valves, or sealed hoppers, from outside events that could trigger an event such as a flash fire or deflagration.

(3) The system is not a bulk raw grain transportation pneumatic system or dust collection system.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_4.pdf	61 CC Note No. 4	

Statement of Problem and Substantiation for Public Comment

Reconsider the definition of Ingredient Transport System and 8.3.3.2.4 regarding the requirements for ingredient transport systems. Consider narrowing the definition to limit the intent of this section to include only those ingredients that are transported to be used in the process. Consider a limit on the size or the capacity of the system. Consider limits on the physical properties of the ingredient being transferred.

Related Item

• CC Note No. 4

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:30:30 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected
Resolution: The Technical Committee believes that the requirement, definition, and the annex material (A.8.3.3.2.4) adequately describe ingredient transport systems.

Public Comment No. 7-NFPA 61-2018 [Section No. 8.3.9.5]

8.3.9.5* Spray Dryer Systems.

8.3.9.5.1 General.

8.3.9.5.1.1

Spray dryer systems shall include the spray dryer and associated fluid bed dryers, cyclones, and dust collectors with the connecting duct work.

8.3.9.5.1.2

A DHA, in accordance with Chapter 7, shall be performed on all spray dryer systems.

8.3.9.5.1.3

The DHA shall address the proper sequence of startup, shutdown, emergency stop, and normal operation.

8.3.9.5.1.4

Spray dryers shall be designed and located in accordance with the requirements of 8.3.9.2.1 through 8.3.9.2.2.7.

8.3.9.5.2 Safety Controls.

8.3.9.5.2.1

Safety controls shall be designed, constructed, and installed such that required conditions of safety for operation of the air heater, dryer, and ventilation equipment are maintained.

8.3.9.5.2.2

The dryer and its auxiliary equipment shall be equipped with excess temperature limit controls arranged to supervise following:

(1) Airstream between the air heater and the drying chamber air inlet

(2) Airstream at the discharge of the cooling and heating sections

8.3.9.5.2.3

Excessive temperatures detected by devices required by 8.3.9.5.2.2 shall initiate an automatic shutdown.

(A)

The automatic shutdown shall accomplish all of the following:

(1) Shut off the fuel to the burners or heating system.

(2) Stop the flow of product out of the dryer.

(3) Stop all airflow from fans into the dryer.

(4) Sound an alarm at a constantly attended location or for the operator, or both, to prompt an emergency response.

(B)

An emergency stop shall be provided that will enable manual initiation of the automatic shutdown.

8.3.9.5.2.4

All safety control equipment shall be nonrecycling, requiring manual reset before the dryer can be returned to operation.

8.3.9.5.3 Dryer Operation.

8.3.9.5.3.1

Operating controls shall be designed, constructed, and installed so that required conditions of safety for operation of the air heater, dryer, and ventilation equipment are maintained.

8.3.9.5.3.2

The drying chamber shall have an operating control that maintains the temperature within prescribed limits.

8.3.9.5.4 Fire Detection.

8.3.9.5.4.1

Every dryer shall have the means for detecting abnormal conditions that indicate the presence or potential of a fire.

8.3.9.5.4.2

The detection of the conditions in 8.3.9.5.4.1 shall activate an alarm and automatically shut down the equipment.

8.3.9.5.4.3*

Means shall be provided for extinguishing fires within the drying chamber.

8.3.9.5.5 Explosion Protection.

8.3.9.5.5.1

When determined to be required by a DHA, explosion protection shall be provided for the dryer and associated equipment.

8.3.9.5.5.2

Where installed, the explosion protection system shall be connected to the process control system. On a signal from the explosion control system, the process shall be shut down automatically.

8.3.9.5.5.3

Where required, the explosion protection system shall be designed in accordance with NFPA 69 or NFPA 68, or a combination of the two as determined appropriate by the DHA.

8.3.9.5.5.4

CO differential early fire detection and suppression systems shall be allowed as a tool to prevent deflagrations from occurring per the requirements of NFPA 69.

8.3.9.5.5.5

Where installed, the explosion protection system shall be permitted to be deactivated automatically during clean-in-place functions.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_2.pdf	61 CC Note No. 2	

Statement of Problem and Substantiation for Public Comment

The committee should review the language used in other dust documents, such as NFPA 652, that specifies that equipment requires explosion protection unless a risk assessment determines that it is not necessary. This should be reviewed throughout NFPA 61 but specifically this new language in 8.3.9.5.5.1 for spray dryers.

Related Item

• FR No. 25

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:28:14 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-6-NFPA 61-2019
Statement:	It is more likely that spray dryers would require explosion protection than not. This aligns with the language used in other dust documents such as NFPA 652.

Correlating Committee Note No. 2-NFPA 61-2018 [Section No. 8.3.9.5]

Submitter Information Verification

Committee:

Submittal Date: Tue Jun 26 12:49:49 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The committee should review the language used in other dust documents, such as NFPA 652, that specifies that equipment requires explosion protection unless a risk assessment determines that it is not necessary. This should be reviewed throughout NFPA 61 but specifically this new language in 8.3.9.5.5.1 for spray dryers.

FR-25-NFPA 61-2018

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
11 Affirmative All
1 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Frank, Walter L.

Gombar, Robert C.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Affirmative with Comment

Aiken, Chris

In the future the correlation notes should be specific highlighting where it is believed that there is a correlation issue so that committees can properly address the concern. Referencing the spray dryer section is specific and useful but

directing the committee to the entire document is not helpful to the committee.

Negative with Comment

Bujewski, Matthew J.

I agree with the comment about spray dryers but believe a risk assessment on everything is not necessary. The prescriptive codes are the risk assessment with the knowledge of years of experience people.

Public Comment No. 11-NFPA 61-2018 [Section No. 8.7.2.4]

8.7.2.4*

A point-of-use dust collector shall be permitted to be mounted directly to conveying equipment in both indoor and outdoor locations, provided all of the following conditions are met:

(1) When the point-of-use dust collector is mounted to an enclosure, such as a bucket elevator leg, the enclosure shall have explosion protection per the provisions of this standard. The volume of the dirty air side and of the transition shall be included in the determination of explosion protection design.

(2) The point-of-use dust collector shall be mounted directly to the conveying equipment housing via a transition duct without an airlock

(3) The transition between the point-of-use dust collector and the vented equipment shall be designed such that dust will release from the filter media and return to the equipment product stream and the transition is not a collection point for dust accumulation under normal operations.

(4) The cross-sectional area of the transition connection shall be equal to or greater than the cross-sectional area of the point-of-use dust collector.

(5) The point-of-use dust collector shall include an integral air-moving device on the clean side of the dust collector to maintain negative pressure.

(6) The point-of-use dust collector shall not be connected to any other pieces of equipment.

(7) Point-of-use dust collectors that return air to the inside of buildings shall be capable of a minimum filtering efficiency of 0.02 g per dry standard cubic meter of airflow (0.008 grains per dry standard cubic feet of airflow).

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_7.pdf	61 CC Note No. 7	

Statement of Problem and Substantiation for Public Comment

Consider providing annex material for no. (7) to provide information as to how to determine if you have met this requirement. Consider a reference to the housekeeping requirements.

Related Item

• CC Note No. 7

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:38:48 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7-NFPA 61-2019
Statement: This new annex provides information as to how to determine if this requirement has been met.

Correlating Committee Note No. 7-NFPA 61-2018 [Section No. 8.7.2.4]

Submitter Information Verification

Committee:

Submittal Date: Thu Jul 12 14:48:21 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: Consider providing annex material for no. (7) to provide information as to how to determine if you have met this requirement. Consider a reference to the housekeeping requirements.

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
11 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Bujewski, Matthew J.

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Gombar, Robert C.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Affirmative with Comment

Aiken, Chris

ok

Frank, Walter L.

Agree that substantive explanation of how to meet this requirement is necessary. For example, a requirement for a filtration efficiency is ambiguous unless the minimum particle size is specified.

Public Comment No. 9-NFPA 61-2018 [Section No. 9.9]

9.9 Management of Change.

9.9.1

The owner/operator shall require that a qualified person knowledgeable in the fire and deflagration hazards of agricultural dust be informed of changes to facilities, equipment, or processed materials before implementation of the change.

9.9.2*

The knowledgeable person shall consider whether or not the change would comply with NFPA 61 and if the change does not comply, then a method of compliance shall be determined.

9.9.3

Implementation of the management of change procedure shall not be required for replacements-in-kind.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_5.pdf	61 CC Note No. 5	

Statement of Problem and Substantiation for Public Comment

Review the annex material for Management of Change (9.9) and consider moving the material into the main text of the chapter for correlation with NFPA 652.

Related Item

• FR No. 12

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:33:41 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-11-NFPA 61-2019
Statement: This revision was made to clarify the correct procedure for management of change for this commodity-specific standard.

Correlating Committee Note No. 5-NFPA 61-2018 [Section No. 9.9]

Submitter Information Verification

Committee:

Submittal Date: Thu Jul 12 14:41:36 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: Review the annex material for Management of Change (9.9) and consider moving the material into the main text of the chapter for correlation with NFPA 652.

FR-12-NFPA 61-2018

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
11 Affirmative All
0 Affirmative with Comments
2 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Frank, Walter L.

Gombar, Robert C.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Negative with Comment

Aiken, Chris

This note is requesting a technical committee to add requirements to a standard. The correlation committee should be reviewing standards for correlation issues, not establishing new technical content. Suggestions for changes to technical content should be submitted through public comments.

Bujewski, Matthew J.

The existing wording is adequate.

Public Comment No. 12-NFPA 61-2018 [Section No. A.5.2.2]

A.5.2.2

Data can be from samples within the facility that have been tested or data can be based on whether the material is known to be combustible or not. There are some published data of commonly known materials, and the use of these data is adequate to determine whether the dust is a combustible dust. For well-known commodities, published data are usually acceptable. A perusal of published data illuminates that there is often a significant spread in values. It is useful, therefore, to compare attributes (such as particle distribution and moisture content) in published data with the actual material being handled in the system whenever possible. Doing so would help to verify that the data are pertinent to the hazard under assessment. Even test data of material can be different from the actual conditions. Users should review the conditions of the test method as well to ensure that it is representative of the conditions of the facility. Where that is not possible, the use of worst-case values should be selected. Composition and particle size are two parameters that are useful to identify the number and location of representative samples to be collected and tested. *(See Section 5.5 for information on sampling.)*

These are locations in which combustible dust is in the air in quantities sufficient to produce explosive or ignitible mixtures under normal operating conditions, or locations where mechanical failure or abnormal operation of machinery or equipment could cause explosive or ignitible mixtures to be produced, and combustible dust in the air could provide a source of ignition through simultaneous failure of electrical equipment, operation of protection devices, or other causes.

Situations can occur in which it is not possible to provide calculated deflagration venting as described in NFPA 68. Such situations do not justify the exclusion of all venting. The maximum practical amount of venting should be provided, since some venting should reduce the damage potential. In addition, consideration should be given to other protection and prevention methods.

Table A.5.2.2 contains examples of test data for selected agricultural dusts with known explosion data parameters. Other databases, such as the IFA (Institute for Occupational Safety and Health of the German Social Accident Insurance), GESTIS-DUST-EX Database Combustion, are available for data on explosion characteristics of dusts.

Please note that the information provided in the table is for the specific agricultural dust sample tested. Explosion severity and ignition sensitivity parameters are greatly influenced by many factors, including particle size distribution, particle morphology, and moisture content. Differences in specific material composition and possible contamination will also affect explosibility parameters. Thus, the information in Table A.5.2.2 will not apply in all cases.

If dealing with an agricultural dust with unknown explosion or ignition sensitivity when designing explosion protection or developing risk mitigation strategies, consider testing the dust in accordance with the relevant ASTM, ISO, or CEN standards so the data being used is as applicable as possible.

Table A.5.2.2 20-L Sphere Test Data — Agricultural Dusts

Dust Name	Percent Moisture	Median Particle Size (µm)	Percent< 200 Mesh(%)	P_{max}(bar g)	(1)K_{St}(bar m/sec)	Minimum Explosive Concentration (g/m^3)	Minimum Ignition Energy (mJ)
Alfalfa	2.1	36	83	6.7	94		
Angel food cake mix	4.1	41		7.5	132		
Apple		155	9	6.7	34	125	
Beet root		108	26	6.1	30	125	
Carrageen	3.8		98	8.5	140		
Carrot	4.0	29	76	6.9	65		
Cereal dust (mixed)	4.4	121		6.7	74	265	
Cheesy pasta sauce mix (corn starch and spices)	7.9	<45	68	7.2	99		45
Chili sauce mix (corn starch and spices)	7.0	79	70	6.6	60		74
Cocoa bean dust	2.3	45	100	7.1	133		
Cocoa powder	3.9	194	14	8.0	162	65	100–180*

Dust Name	Percent Moisture	Median Particle Size (μm)	Percent< 200 Mesh(%)	P_{max}(bar g)	(1)K_{St}(bar m/sec)	Minimum Explosive Concentration (g/m^3)	Minimum Ignition Energy (mJ)
Coconut shell dust	6.5		51	6.8	111		
Coffee dust – coarse particles	4.8	321	0.4	6.9	55		160*
Coffee dust – fine particles	4	40	100	7.7	158		
Corn (maize)	9.0	165		8.7	117	30	>10
Corn meal	8.2	403	0.6	6.2	47		
Cornstarch – coarse particles	2.2	217	0.1	7.9	186		30–60*
Cornstarch – fine particles		11	100	9.5	194	60	
Cotton		44	72	7.2	24	100	
Cottonseed		245	10	7.7	35	125	
Fudge brownie mix	4.8	221		5.8	43		
Garlic powder				8.6	164		
Gluten		150	33	7.7	110	125	
Grass dust		200		8.0	47	125	
Green coffee	5.0	45	81	7.8	116		
Hops (malted)		490	9	8.2	90		
Lemon peel dust	9.5	38	73	6.8	125		
Lemon pulp	2.8	180	17	6.7	74		
Linseed		300		6.0	17		
Locust bean gum	1.7		53	7.8	78		
Malt	10.5	72	54	7.5	170		
Milk powder	3.1	41	88	7.5	145		
Oat flour	4.3	180	0.2	6.8	64		
Oat grain dust		295		6.0	14	750	
Olive pellets				10.4	74	125	
Onion powder				9.0	157		
Parmesan sauce mix (corn starch and spices)	6.7	66	60	6.1	45		62
Parsley (dehydrated)	5.4		26	7.5	110		
Peach		140	17	8.4	81	60	
Peanut meal and skins	3.8			6.4	45		
Peat		74	48	8.3	51	125	
Potato		82	30	6	20	250	
Potato flakes	8.0	249	7.0	6.2	33		
Potato flour		65	53	9.1	69	125	
Potato starch		32	100	9.4	89		>3200

Dust Name	Percent Moisture	Median Particle Size (µm)	Percent< 200 Mesh(%)	P_{max}(bar g)	(1)K_{St}(bar m/sec)	Minimum Explosive Concentration (g/m^3)	Minimum Ignition Energy (mJ)
Raw yucca seed dust	12.7	403	5	6.2	65		
Rice dust	2.5		4	7.7	118		40–120*
Rice flour	12.2	45	100	7.7	140	65	>500
Rice starch		18	90	10	190		
Rye flour		29	76	8.9	79		
Semolina	13.6	57	100	7.0	109		
Snack mix spices	8.3	85		6.8	73		
Soybean dust	2.1		59	7.5	125		
Spice dust	10.0		2	6.9	65		
Spice powder	10.0			7.8	172		
Sugar, fine	1.3	45	100	7.6	117	135	38
Sugar, granulated	2	152	13	6.2	66		
Sugar, powdered	13	45	100	7.0	122		30*
Sunflower		420	10	7.9	44	125	
Tea	6.3	77	53	7.6	102	125	
Tobacco blend	1.0	120		8.0	124		
Tomato		200		1		100	
Walnut dust	6.0		31	8.4	174		
Wheat/rice cereal base	2.8	187		5.7	28	150	
Wheat/rice cereal base regrinds	6.4	217		6.4	29		
Wheat flour	12.9	57	60	8.3	87	60	
Wheat grain dust		80	48	9.3	112	60	
Wheat starch		20		9.8	132	60	25–60*
Xanthan gum	8.6	45	91	7.5	61		
Yellow cake mix	6.1	219		6.3	73		

*The SFPE *Handbook of Fire Protection Engineering*, 4th Edition, Table 3-18.2.

Notes:

(1) Normalized to 1 m^3 test vessel pressures, per ASTM E1226, *Standard Test Method for Explosibility of Dust Clouds.*

(2) See also Table F.1(a) in NFPA 68 for additional information on agricultural dusts with known explosion hazards.

(3) For those agricultural dusts without known explosion data, the dust should be tested in accordance with established standardized test methods.

Additional Proposed Changes

File Name	Description	Approved

Updated_Table_A522_NFPA_61_FM_Data_11_12_18.xlsx	Attached is a revised version of Table A.5.2.2 20-l Sphere Test Data.

Statement of Problem and Substantiation for Public Comment

Please replace the current table in Annex A with the table in the attached file. This revised table includes updated information on the existing dusts in the table. In addition, new dusts that were not on the previous table have been added.

Related Item

• PI

Submitter Information Verification

Submitter Full Name: Jess McCluer
Organization: National Grain and Feed Associ
Street Address:
City:
State:
Zip:
Submittal Date: Thu Nov 15 14:03:44 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-18-NFPA 61-2019
Statement: This revised table includes updated information on the existing dusts in the table. In addition, new dusts that were not on the previous table have been added.

Dust Name	Test Report Date	Sample Ground	Sample Sieved	Sample Dried	Percent Moisture as received	Percent Moisture at tested	Median Partical Size (um) As Received	Meidan Partical Size (um) As Tested	Percent < 200 (or <250) mesh as tested	P_{max} (bar g)	K_{st} (bar m/sec)	Minimum Explosive Concentration (MEC, g/m^3)	Minimum Ignition Energy (mJ)
Barley		Yes	Yes	No	Unk	Unk	Unk	Unk	Unk	Unk	Unk	NT	NT
Betaine - Nutraceutical anhydrous Betaine.	5/4/18	No	Yes	Yes	Unk	0.55	Unk	<45	100	9	286	190	NT
Alfalfa concentrate		No	Yes	Yes	Unk	2.10	Unk	36	99	6.7	94	NT	NT
Alfala Powder		No	Yes	Yes	Unk	4.50	Unk	103	100	7.9	75	NT	NT
Angel Food Cake Mix	7/10/12	No	Yes	No	4.10	4.10	107	41	100	7.5	132	NT	NT
Apple		No	Yes	Unk	Unk	Unk	Unk	155	Unk	6.7	34	125	NT
Canola Meal Dust		No	Yes	Unk	Unk	6.40	Unk	149	(59.8)	6.2	15	NT	NT
Carrageen		No	Yes	Yes	Unk	3.80	Unk	Unk	100	8.5	140	NT	NT
Carrageenan		No	Yes	Yes	Unk	1.20	Unk	47	100	5.2	32	NT	NT
Carrot		No	Yes	Yes	Unk	4.00	Unk	29	97	6.9	65	NT	NT
Cereal Dust		No	Yes	Yes	Unk	4.90	Unk	94	80	6.6	96	265	NT
Cereal Waste Dust (Bran 80%, Flour 10%)		No	Yes	No	Unk	11.00	Unk	120	(99.8)	8.2	183	NT	NT
Cheesy Pasta (Corn starch & various spices)	1/15/14	No	Yes	Unk	Unk	7.90	Unk	45	80	7.2	99	NT	30-100
Chili (Corn starch and various spices)	1/15/14	No	Yes	Unk	Unk	7.00	Unk	79	65	6.6	60	NT	30-100
Cinnamon	1/15/14	No	Yes	Unk	Unk	7.00	Unk	79	65	6.6	60	NT	30-100
Cocoa Bean Shell Dust	6/22/16	No	Yes	Yes	Unk	4.40	Unk	52	100	6.7	42	NT	NT
Cocoa Powder	2/25/09	No	Yes	Yes	Unk	3.90	Unk	194	50	8	162	65	NT
Coconut shell dust	12/11/90	No	Yes	Unk	Unk	6.50	Unk	Unk	80	6.8	111	NT	NT
Coffee Grounds Dust	4/9/09	No	Yes	Yes	Unk	4.00	Unk	40	100	7.7	158	NT	NT
Coffee dust (Instant Coffee)	3/21/16	No	Yes	Yes	Unk	2.40	Unk	45	100	6.8	101	NT	NT
Coffee (Green)		No	Yes	Yes	Unk	4.60	Unk	57	100	7.6	116	NT	NT
Coffee Creamer (French Vanilla)		No	Yes	Yes	Unk	3.10	Unk	57	(94.6)	7.6	156	NT	NT
Corn maize		No	Yes	Unk	Unk	Unk	Unk	165	55	8.7	117	30	>10
Corn Meal	5/30/96	No	Yes	Yes	Unk	1.60	Unk	589	8	7	35	NT	NT
Cornstarch	3/12/13	No	Yes	Unk	Unk	11.40	Unk	45	98	7.8	139	NT	NT
Cornstarch - course particles		No	Yes	Yes	Unk	2.20	Unk	217	(62.5)	7.9	186	NT	NT
Cotton (flocks, pulverized)		No	Yes	Unk	Unk	Unk	Unk	44	100	7.2	44	NT	NT
Cotton lint dust		No	Yes	Yes	Unk	4.80	Unk	180	(43.6)	8.6	88	NT	NT
Cottonseed (Expeller, Silo entrance)		No	Yes	Unk	Unk	Unk	Unk	245	(50)	7.7	35	125	NT
DDGS Yellow Corn (Dried Distillers Dried Grains w/solubles)		No	Yes	Yes	Unk	4.20	Unk	225	(43.8)	6.5	42	NT	NT
DDGS Wheat (Dried Distillers Dried Grains w/solubles)		No	Yes	Yes	Unk	4.40	Unk	189	(67.1)	7.5	105	NT	NT
Fudge Brownie Mix	7/10/12	No	Yes	No	4.80	4.80	291	221	(65.3)	5.8	43	NT	NT
Garlic powder		No	Unk	Unk	Unk	Unk	Unk	Unk	Unk	8.6	164	NT	NT
Garlic powder, onion powder extract loc bac and salt (From Dus		No	Yes	Yes	Unk	2.30	Unk	176	(35.3)	4	15	NT	NT
Gluten Meal		No	Yes	Unk	Unk	Unk	Unk	150	Unk	7.7	110	125	NT
Gluten - Wheat		No	Yes	Unk	Unk	5.20	Unk	81	(96)	7.3	137	NT	NT
Grain Dust (Mixed from asperator)		No	Yes	Yes	Unk	0.00	Unk	45	(93.1)	8.6	157	NT	NT
Grain Dust (Mixed reintroduced from cyclone)		No	Yes	Unk	Unk	8.30	Unk	65	(83.1)	7.7	129	NT	NT
Grass Dust		No	Yes	Unk	Unk	Unk	Unk	200	8	47		125	NT
Hops, malted		No	Unk	Unk	Unk	Unk	Unk	490	Unk	8.2	90	NT	NT
Hops Dust (overhead ceiling structure)		No	Yes	no	8.30	8.30	Unk	54	(98)	7.4	159	75	NT
Lemon peel dust		No	Yes	No	9.50	9.50	Unk	38	(95.6)	6.8	125	NT	NT
Lemon Pulp dust		No	Yes	Yes	Unk	2.80	Unk	180	(61)	6.7	125	NT	NT
Linseed, soya (dust from silo)		No	Unk	Unk	Unk	Unk	Unk	30	100	8	50	NT	NT
Locust Bean Gum		No	Unk	Unk	Unk	1.70	Unk	Unk	100	7.8	78	NT	NT
Malt		No	Yes	No	10.50	10.50	Unk	72	(95)	7.5	170	NT	NT

Maltodextrin		No	Yes	Yes	Unk	2.70	Unk	45	100	8.1	125	100	NT
Maltodextrin flavoring		No	Yes	Yes	Unk	2.70	Unk	47	100	9.2	207	NT	NT
Milk Powder		No	Yes	Yes	Unk	3.10	Unk	41	(99.5)	7.5	145	NT	NT
Oat Flour		No	Yes	Yes	Unk	4.50	Unk	107	(87.1)	6.3	82	NT	NT
Oat Grain Dust from Asperator	6/21/17	No	Yes	Yes	9.20	4.40	245	113	(63.1)	7	51	NT	NT
Oat Bran Dust		No	Yes	No	8.00	8.00	Unk	195	(78.3)	6.8	77	80	NT
Olive Pellets		unk	Unk	Unk	Unk	Unk	Unk	Unk	100	10.4	74	125	>1000
Onion Powder		unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk			NT	NT
Parmesan Sauce Mix (corn starch & spices)		No	Yes	No	6.70	6.70	Unk	66	(84.9)	6.1	45	NT	30-100
Parsley (dehydrated)		No	Unk	Unk	Unk	5.40	Unk	Unk	63.3	7.5	110	NT	NT
Parsley (dried)		No	Unk	Unk	Unk	4.50	Unk	132	(72)	6.4	67	NT	NT
Pea Fiber (>95% pea dust)	5/30/13	No	Yes	Yes	9.70	3.30	206	107	(74.8)	6.4	68	NT	NT
Peach powder, hot-spray-dried (hygroscopic)		No	Unk	Unk	Unk	Unk	Unk	140	Unk	8.4	81	60	NT
Peanut hull dust from asperator		No	Unk	Unk	Unk	9.90	Unk	90	(98.4)	7.4	165	NT	NT
Peanut meal & skins		No	unk	Unk	Unk	3.80	Unk	Unk	Unk	6.4	45	NT	NT
Peat dust (from overhead ceiling structure)		No	Unk	Unk	Unk	Unk	Unk	49	66	8.4	81	60	NT
Potato Dust (>95% from asperator)		No	Yes	Unk	Unk	5.00	Unk	45	(99.7)	8.5	93	NT	NT
Potato Flour		No	Unk	Unk	Unk	Unk	Unk	65	100	9.1	69	125	NT
Potato Flakes (90% potato, 10% water)		No	Unk	Unk	Unk	Unk	Unk	313	(26.3)	7.3	38	NT	NT
Potato Starch		No	Unk	Unk	Unk	Unk	Unk	28	100	8.2	116	NT	NT
Rice Dust		No	Unk	Unk	Unk	2.50	Unk	Unk	(50)	7.7	118	NT	NT
Rice Flour		No	Unk	Unk	Unk	12.20	Unk	45	100	7.7	140	65	NT
Rice Starch		No	Unk	Unk	Unk	Unk	Unk	18	90	10	190	NT	NT
Rye Dust (from asperator)		No	Unk	Yes	Unk	3.70	Unk	45	100	8.5	139	NT	NT
Rye Flour (from silo)		No	Unk	Unk	Unk	7.80	Unk	57	100	7.1	100	NT	NT
Rye Meal		No	Unk	Unk	Unk	6.20	Unk	45	(64.4)	7.3	140	NT	NT
Semolina		No	Yes	Unk	Unk	13.60	Unk	57	100	7	109	NT	NT
Snack Seasoning		No	Unk	Unk	Unk	4.70	Unk	203	(70.7)	5.1	34	510	NT
Sorghum		Yes	Yes	Yes	Unk	Unk	Unk	Unk	Unk	Unk	Unk	NT	NT
Soybean Dust		No	Unk	Yes	Unk	2.10	Unk	Unk	100	7.5	125	NT	NT
Soybean Flour (Defatted)		No	Unk	Unk	Unk	3.70	Unk	45	100	7.7	148	NT	NT
Spice Powder		No	Unk	Unk	Unk	10.00	Unk	Unk	Unk	7.8	172	NT	NT
Sugar Dust		No	Yes	Yes	Unk	1.60	Unk	45	100	7.1	188	NT	NT
Sugar Dust (Beet)	3/22/18	No	Yes	Yes	Unk	1.60	Unk	<45	100	5.8	84	NT	NT
Sugar Dust (Beet)	3/22/18	No	Yes	Yes	Unk	1.00	Unk	<45	100	5.4	74	NT	NT
Sugar Dust (Beet-Cooler Baghouse)	7/14/14	No	Yes	Yes	Unk	1.00	Unk	<45	100	8	146	NT	12
Sugar (granulated)		No	Yes	Yes	Unk	0.60	Unk	76	(73.6)	6.3	122	NT	NT
Sugar (powdered)		No	Yes	No	Unk	13.00	Unk	45	100	7	122	NT	NT
Sunflower seed dust		No	Unk	No	Unk	9.70	Unk	500	(17)	7.8	92	NT	NT
Tea (from overhead beams)		No	Yes	No	Unk	6.30	Unk	77	(72.3)	7.6	102	NT	NT
Tobacco Blend		No	Yes	Yes	Unk	1.00	Unk	120	100	8	124	NT	NT
Tomato (powder, hot-spray-dried, highly hygroscopic		No	Yes	Yes	Unk	1.00	Unk	120	100	8	124	NT	NT
Walnut Dust		No	Yes	Unk	Unk	6.00	Unk	Unk	72	8.4	174	NT	NT
Wheat Flour (Whole Grain)		No	Yes	Yes	Unk	2.70	Unk	58	100	7.7	145	NT	<300
Wheat Grain Dust		No	Unk	Unk	Unk	Unk	Unk	80	Unk	9.3	112	60	NT
Wheat Starch		No	Yes	Unk	Unk	11.50	Unk	45	(98.9)	7.6	155	130	>500
Wheat Cereal 55%, Rice Flour 20%		No	Unk	Unk	Unk	2.80	Unk	187	(64.7)	5.7	28	NT	NT
Xanthan Gum		No	Unk	Unk	Unk	8.60	Unk	45	(99)	7.5	61	NT	NT
Yellow Cake Mix	7/10/12	No	Yes	Unk	Unk	2.70	354	219	(30.6)	6.3	73	NT	NT
Yucca Seed Dust (raw)		No	Unk	Unk	Unk	12.70	Unk	403	(29.9)	6.2	65	NT	NT
Yucca Seed Dust (hydrolized)		No	Unk	Unk	Unk	5.50	Unk	194	(64)	7	156	NT	NT

Public Comment No. 10-NFPA 61-2018 [Section No. A.8.7.2.2]

A.8.7.2.2

Legs are the most frequent location of known primary dust explosions and can experience malfunctions, which can result in ignition of the returned dust. This section is not intended to apply to point-of-use dust collectors.

Additional Proposed Changes

File Name	Description	Approved
61_CC_Note_6.pdf	61 CC Note No. 6	

Statement of Problem and Substantiation for Public Comment

Review the annex material for Management of Change (9.9) and consider moving the material into the main text of the chapter for correlation with NFPA 652.

Related Item

• CC Note No. 6

Submitter Information Verification

Submitter Full Name: CC on CMD-AAC
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue Nov 13 11:36:30 EST 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected
Resolution: The Technical Committee believes the language is clear where it is, and it would not make sense to write it as a requirement. Point-of-use dust collectors are covered elsewhere.

Correlating Committee Note No. 6-NFPA 61-2018 [Section No. A.8.7.2.2]

Submitter Information Verification

Committee:
Submittal Date: Thu Jul 12 14:46:57 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: Consider moving the last sentence to the main text as a requirement.

Ballot Results

This item has passed ballot

15 Eligible Voters
2 Not Returned
12 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned

McAlister, Steve

Stevenson, Bill

Affirmative All

Bujewski, Matthew J.

Cholin, John M.

Creswell, Gregory F.

Davis, Scott G.

Frank, Walter L.

Gombar, Robert C.

Kreitman, Kevin

LeBlanc, John A.

Mattos, Jr., Arthur P.

Osborn, Jack E.

Roberts, Jeffrey R.

Taveau, Jérôme R.

Negative with Comment

Aiken, Chris

This note is requesting a technical committee to add requirements to a standard. The correlation committee should be reviewing standards for correlation issues, not establishing new technical content. Suggestions for changes to technical content should be submitted through public comments.

Public Comment No. 3-NFPA 61-2018 [Section No. F.3]

F.3 Checklist.

See Figure F.3 for an example of a combustible dust checklist.

Figure F.3 Combustible Dust Checklist.

	COMBUSTIBLE DUST CHECKLIST	Expectation Compliance			Comments/Actions	Responsible	Date Due
	Site:						
	Date:	Yes	No	N/A			
1.0 COMBUSTIBLE DUST EXPLOSION PREVENTION TRAINING INFORMATION							
1.1	Is job-specific training on the hazards and controls of combustible dust provided annually to all employees, including, but not limited to, cleaning procedures for grinding equipment, loading areas, dust control systems, ducting, conveyors, and elevators (including clearing choked legs); housekeeping; preventative maintenance; critical safety devices; and hot work? (Dust is generally defined as solid particles with a diameter of 500 microns or less.)						
1.2	Is combustible dust training provided annually to the design engineers and other technical staff involved in facility engineering and upgrade projects?						
1.3	Is orientation provided for supervisors who are transferred to a new location? (Orientation is to include specific information and training on plant safety control systems and testing requirements for combustible dust operations.)						
1.4	Are "Smoking Prohibited" and "No Hot Work Without a Permit to Work" signs posted throughout the facility? Are formal hot work procedures in place?						
1.5	Are the properties and hazards of all combustible dusts (including K_{st}, P_{max}, and MIE, with related particle size information) present on the site known and communicated to all employees using safety data sheets and/or other technical documents?						
1.6	Are combustible dust hazard area identification procedures in place and are all hazardous areas identified in the field (e.g., by EX sign)?						
2.0 CONTRACTORS							
2.1	Are contractors informed of all known/potential hazards related to their work as well as site safety rules implemented to reduce combustible dust fire and explosion hazards, including, but not limited to, emergency action plans, hot work, other known/potential ignition sources, continual grounding, cleaning out of combustible loads before commencing work, and prohibition of smoking in hazardous areas?						
2.2	Is job-specific specific training provided annually to contractors, including, but not limited to, cleaning procedures for grinding equipment, dust collection systems, ducting, conveyors, and elevators (including clearing choked legs); housekeeping; preventative maintenance; critical safety devices; and hot work?						
3.0 HOUSEKEEPING							
3.1	Are there established written housekeeping and inspection procedures that describe the frequency and methods determined best to reduce accumulations of combustible dust?						
3.2	Does the housekeeping program address combustible dust accumulations at the following priority areas:						
	(a) Floor areas within 10.7 m (35 ft) of inside bucket elevators?						
	(b) Floors of enclosed areas containing grinding equipment?						
	(c) Floors of enclosed areas containing dryers located inside the facility?						
3.3	Are dust accumulations on ledges, walls, rafters, beams, ducts, and ceiling surfaces in identified priority areas maintained below acceptable limits [e.g., 0.32 cm (⅛ in.)]?						
3.4	Is the use of compressed air or other means that causes dust to be suspended in air during removal from ledges, walls, beams, ducts, and surfaces forbidden in areas where combustible dust is present, or permitted only after all machinery that represents an ignition source has been shut off and all other known sources of ignition have been removed or controlled?						

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	COMBUSTIBLE DUST CHECKLIST	Expectation Compliance			Comments/Actions	Responsible	Date Due
	Site:						
	Date:	Yes	No	N/A			
3.0 HOUSEKEEPING							
3.5	When was the last blow down conducted?						
3.6	Are the ledges, walls, rafters, beams, ducts, and ceiling free of dust buildup?						
3.7	Is the storage of lubricants, greases, and flammable liquids and gases in a detached building or separate closed storage area?						
4.0 PREVENTATIVE MAINTENANCE							
4.1	Has a formal preventative maintenance program been established for dryers, dust collectors, flexible connectors, differential pressure gauges, bucket elevators, and any other dust handling/producing/processing equipment that specifically includes the verification of grounding and bonding?						
4.2	Are vent inspections conducted (i.e., in accordance with NFPA 68 and supplier recommendations)?						
4.3	Are annual inspections for prevention and protection equipment undertaken by the manufacturer where required (in accordance with process assessment and NFPA 69)?						
4.4	Are all critical safety systems tested (as required by process safety assessment and NFPA facility standard)?						
4.5	Are records of preventative maintenance activities and testing programs maintained and do they include, at minimum, the equipment inspected, name of inspector, and date of inspection?						
4.6	Is all preventative maintenance performed by qualified individuals?						
4.7	Are all bearings maintained per the manufacturers' instructions and kept free of combustible dust, product, and excessive lubrication?						
5.0 DRY SOLID PRODUCT MOVEMENT AND STORAGE (GENERAL)							
5.1	Are receiving systems prior to the leg provided with magnetic protection, or are other systems installed/provided for tramp materials before processing equipment (e.g., hammer mills, grinders, and pulverizers)?						
5.2	Is the whole process dusttight?						
5.3	Are delivery vehicles (such as trucks and railcars) grounded before discharge?						
5.4	Where flexible connections are employed, are they appropriately grounded and bonded?						
5.5	Are ducting and flexible connections dusttight and able to resist the pressure and heat increase of a deflagration when associated with venting, isolation, or suppression systems?						
5.6	Where explosion vents are applied, is the vent sizing design basis on record and is the flame ball trajectory verified as safe by a qualified person?						
5.7	Have there been any process or material changes since the design basis was determined?						
5.8	Are all changes to systems with combustible dust controlled by a formal MOC system?						
5.9	Where explosion vent discharge is ducted to atmosphere, does the design basis take account of the ducting? Is the ducting strong enough to resist the pressure and heat increase of the application?						
5.10	Are process connections isolated (in accordance with process safety assessment and NFPA 69) to prevent propagation of a dust explosion?						
6.0 GRAIN RECEIVING AND STORAGE (LEGS)							
6.1	Are leg casing head and boot systems dusttight?						
6.2	Are boot sections of leg(s) provided with sealed, securable inspection openings to allow cleanout and inspection?						
6.3	Are head sections of leg(s) provided with sealed, securable inspection openings for inspection of belt tracking, pulley lagging, and proper discharge?						

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	COMBUSTIBLE DUST CHECKLIST	Expectation Compliance			Comments/Actions	Responsible	Date Due
	Site:						
	Date:	Yes	No	N/A			
6.0 GRAIN RECEIVING AND STORAGE (LEGS)							
6.4	Are all bearings mounted externally on elevator legs?						
6.5	Are all elevator legs appropriately protected/vented?						
6.6	Are elevator leg sprinkler systems installed?						
6.7	Is each elevator leg equipped with a slow-down device that will cut power to the leg and alarm, in accordance with NFPA 61, at a minimum of 80 percent of normal operating speed? Note: Feed to leg by mechanical means shall be diverted or stopped.						
6.8	Has a system been established to ensure slow-down devices are installed properly and inspected regularly, and that the following have been done?						
	(a) Verify inspection records.						
	(b) Visually verify slow-down device installation.						
	(c) Visually verify slow-down device set points and function.						
6.9	Are bearing temperature sensors installed?						
6.10	Has a system been established to ensure bearing temperature sensors are installed properly and inspected regularly, and that the following have been done?						
	(a) Verify inspection records.						
	(b) Visually verify bearing temperature device installation.						
	(c) Visually verify bearing temperature set points and function.						
6.11	Are belt alignment devices (e.g., rub blocks) installed?						
6.12	Has a system been established to ensure belt alignment sensors (e.g., rub blocks) are installed properly and tested regularly, and that the following have been done?						
	(a) Verify inspection records.						
	(b) Visually verify belt alignment sensor installation.						
	(c) Visually verify belt alignment sensor set point and function.						
6.13	Where explosion vents are applied, is the vent designed to avoid injuries to personnel by vent discharge? Have there been any process changes since the design basis was determined?						
6.14	Are ducts isolated in accordance with NFPA 654 to prevent propagation of a dust explosion?						
7.0 GRAIN RECEIVING AND STORAGE (CONVEYORS)							
7.1	Are flippers, plows, and/or wipers installed and functioning properly?						
7.2	Is an inspection system established to ensure belt wipers are in place and not worn?						
7.3	Is an inspection system established to ensure conveyor covers are secured?						
7.4	Are conveyor emergency stops installed and routinely tested to ensure appropriate function?						
7.5	Are bearing temperature sensors installed?						
7.6	Is process shutdown automatic when bearing temperature exceeds the set point?						
7.7	Has a purchasing standard for belts and lagging been established and implemented to ensure such belts are static conductive, oil resistant, and fire retardant (SCOF or FRAS), and will not have a surface electrical resistance that exceeds 300 megaohms?						

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	COMBUSTIBLE DUST CHECKLIST	Expectation Compliance			Comments/Actions	Responsible	Date Due
	Site:						
	Date:	Yes	No	N/A			
8.0 ELECTRICAL							
8.1	Has the location completed a survey to identify and classify areas with combustible dusts for electrical hazardous risks (e.g., Class II, Group G, Division 1 or Class II, Group G, Division 2)? Note: A Class II, Group G, Division 1 location is a location at which combustible dust is usually in suspension during normal operation. A Class II, Group G, Division 2 location is a location at which combustible dust is not in suspension during normal operation.						
8.2	Does electrical equipment and wiring within the location meet the requirements for the area hazard classification?						
8.3	Are the Motor Control Centers (MCCs) clean and buckets (cabinets) free of dust accumulations?						
8.4	Is the MCC pressurization system and alarm installed and working properly?						
8.5	Are infrared tests and other specified preventative maintenance tests on electrical equipment conducted?						
8.6	Where determined necessary, is lightning protection installed and properly maintained?						
8.7	Is comfort heating in areas of combustible dust designed to prevent an ignition of a dust cloud or layers of dust on hot surfaces, in accordance with NFPA 61?						
9.0 DUST FILTER SYSTEMS							
9.1	Are dust collectors installed outside or in accordance with one of the following options:						
	(a) Located in an area inside the facility that is protected by an explosion suppression system; or						
	(b) Located in an area inside the facility that is separated from other areas of the facility by construction having at least a 1-hour fire resistance rating and being adjacent to an exterior wall, and explosion vented to the outside?						
9.2	Are filter systems interlocked?						
9.3	Is a pressure drop instrumentation installed and functioning properly?						
9.4	Are pressure drop gauges interlocked?						
9.5	Has a bag or other filter media change schedule been established and followed?						
9.6	Is dust from the dust collection system prevented from being returned directly to the elevator leg?						
9.7	Are ducts isolated to prevent propagation of a dust explosion? Note: Where clean air lines are returned into the building, these also require isolation.						
9.8	Are appropriate grounding measures in place for filter body and bag mechanisms?						
10.0 GRAIN PROCESSING EQUIPMENT							
10.1	Are hammer mills and other processing equipment equipped with spark detection?						
10.2	Is the spark detection device included on maintenance inspection schedules and tested as required?						
11.0 DUST SUPPRESSION OIL SYSTEMS							
11.1	Are dust suppression oil systems installed where required?						
11.2	Is there a means to determine oil dosage?						
11.3	Is there a signal in place to inform the operator that the system is not working properly?						
12.0 GRAIN DRYERS							
12.1	Is there a pre-cleaning system ahead of the dryer?						
12.2	Is the dryer equipped with adequate access doors for cleaning or fire fighting?						
12.3	In the event of a fire, is there an emergency grain dump system to prevent hot grain from going to storage?						

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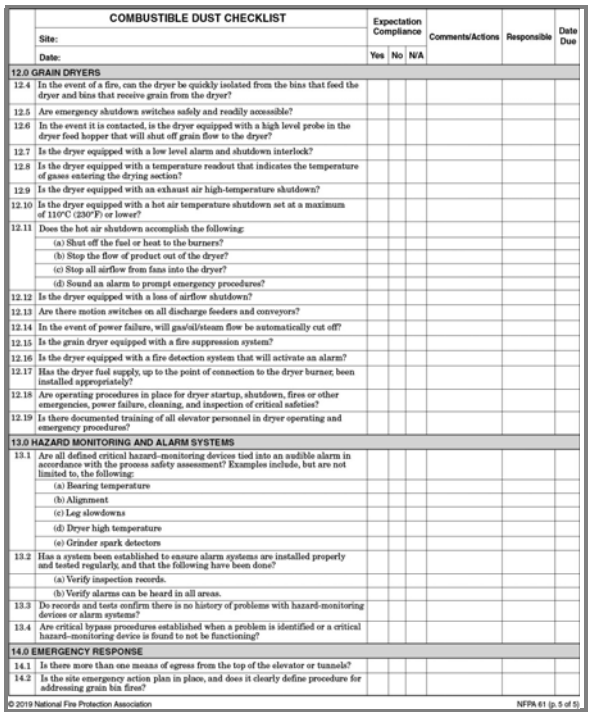

	COMBUSTIBLE DUST CHECKLIST	Expectation Compliance			Comments/Actions	Responsible	Date Due
	Site:						
	Date:	Yes	No	N/A			
12.0 GRAIN DRYERS							
12.4	In the event of a fire, can the dryer be quickly isolated from the bins that feed the dryer and bins that receive grain from the dryer?						
12.5	Are emergency shutdown switches safely and readily accessible?						
12.6	In the event it is contacted, is the dryer equipped with a high level probe in the dryer feed hopper that will shut off grain flow to the dryer?						
12.7	Is the dryer equipped with a low level alarm and shutdown interlock?						
12.8	Is the dryer equipped with a temperature readout that indicates the temperature of gases entering the drying section?						
12.9	Is the dryer equipped with an exhaust air high-temperature shutdown?						
12.10	Is the dryer equipped with a hot air temperature shutdown set at a maximum of 110°C (230°F) or lower?						
12.11	Does the hot air shutdown accomplish the following:						
	(a) Shut off the fuel or heat to the burners?						
	(b) Stop the flow of product out of the dryer?						
	(c) Stop all airflow from fans into the dryer?						
	(d) Sound an alarm to prompt emergency procedures?						
12.12	Is the dryer equipped with a loss of airflow shutdown?						
12.13	Are there motion switches on all discharge feeders and conveyors?						
12.14	In the event of power failure, will gas/oil/steam flow be automatically cut off?						
12.15	Is the grain dryer equipped with a fire suppression system?						
12.16	Is the dryer equipped with a fire detection system that will activate an alarm?						
12.17	Has the dryer fuel supply, up to the point of connection to the dryer burner, been installed appropriately?						
12.18	Are operating procedures in place for dryer startup, shutdown, fires or other emergencies, power failure, cleaning, and inspection of critical safeties?						
12.19	Is there documented training of all elevator personnel in dryer operating and emergency procedures?						
13.0 HAZARD MONITORING AND ALARM SYSTEMS							
13.1	Are all defined critical hazard–monitoring devices tied into an audible alarm in accordance with the process safety assessment? Examples include, but are not limited to, the following:						
	(a) Bearing temperature						
	(b) Alignment						
	(c) Leg slowdowns						
	(d) Dryer high temperature						
	(e) Grinder spark detectors						
13.2	Has a system been established to ensure alarm systems are installed properly and tested regularly, and that the following have been done?						
	(a) Verify inspection records.						
	(b) Verify alarms can be heard in all areas.						
13.3	Do records and tests confirm there is no history of problems with hazard-monitoring devices or alarm systems?						
13.4	Are critical bypass procedures established when a problem is identified or a critical hazard–monitoring device is found to not be functioning?						
14.0 EMERGENCY RESPONSE							
14.1	Is there more than one means of egress from the top of the elevator or tunnels?						
14.2	Is the site emergency action plan in place, and does it clearly define procedure for addressing grain bin fires?						

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Additional Proposed Changes

File Name	Description	Approved
NFPA_61_Task_Team_DHA_Checklist_submitted.xlsx	Replacement Checklist	

Statement of Problem and Substantiation for Public Comment

Current Checklist is incomplete

Related Item

- Task Team on Checklist

Submitter Information Verification

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Submittal Date: Thu Oct 25 16:05:05 EDT 2018
Committee: CMD-AGR

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-8-NFPA 61-2019
Statement: The table has been replaced with a more detailed, comprehensive example of a DHA that covers agricultural and food dust.

NFPA 61 – Food Plant Dust Hazard Analysis (DHA) Checklist

(Completed document and associated reference material meets the requirements for documentation of "Dust Hazard Analysis" (DHA) [652:7.2.3]. A systematic review to identify and evaluate the potential fire flash fire, or explosion hazards associated with the presence of one of more combustible particulate solids in a process or facility. [652, 2016]). It may be used at facilities that have simple conversion technologies, such as but not limited to: Grain Elevators, Flour Mills, Mix Plants, Cereal plants and Dough plants.

	Date DHA Completed:	
	Date DHA Modified:	
	Date DHA Reviewed:	

For new processes that will be constructed and facility processes that are undergoing significant modification, the owner/operator shall complete DHAs as part of the project. For existing processes and facility compartments that are not undergoing significant modification, the owner/operator shall schedule and complete DHAs of bucket elevators, conveyors, grinding equipment, spray dryer systems, and dust collection systems within a 5-year period from the effective date of the standard. [61: 7.1]

	Facility Owner:	
	Facility Operator:	
	Person Responsible for DHA:	
	Others Involved in DHA:	

The DHA shall be performed or led by a **qualified person**. [652:7.2.2] The owner/operator of a facility where materials that have been determined to be combustible or explosible are present in an enclosure shall be responsible to ensure a DHA is completed in accordance with the requirements. [652:7.1.1]

1.0 Materials Evaluation		Yes	No	N/A	Comments	Action	Date Due
1.1	Is there a comprehensive list of all materials present at the facility that present a creditable combustible dust hazard?						

Hazard Identification is based on most recent chapter 5 of NFPA 61. List of materials shall be kept in appropriate form, electronic or paper. The list of materials shall reference method used to define hazard [652: 1.1, 61: 51.1.1.1] In process half product and mixes that contain dust less than 500 micron shall also be listed and evaluated.

1.2	Does the list include Material Data: Sieve Analysis, Kst Testing, MIE (if warranted by Kst testing) and reference used to define material characteristics, etc.?						
1.3	Location of list:						
1.4	Most food ingredients have Kst of less than 200. Do any of the materials on the list have a Kst greater than 200?						
1.4a	If yes, where are these materials stored, transported, and used?						

Hazard Identification is based on several factors, a higher than 200 Kst means the material is more energetic than a typical food ingredient and therefore these materials should be first on any facilities evaluation list. If all materials have similar Kst and other characteristics the evaluation of the hazard may be simplified to a typical general case.

1.5	Most food ingredients have Minimum Ignition Energy that is greater than 10 mj. Do any of the materials on the list have a MIE of less than 10 mj?						
1.5a	If yes, where are these materials stored, transported, and used?						

If the MIE is found to be less than 10 mj then an unusual static energy risk exists, and the facility must be prepared to institute special handling procedures to prevent dust ignition.

1.6	Have P&IDs or similar documents been used to identify equipment and processes that need to be evaluated?						

Where are the processes and facility areas where flash fire, and explosion hazards potentially exist?

1.7	Location of system P&IDs highlighting equipment to be evaluated?						
1.8	Location of facility drawing illustrating areas of potential concern:						
1.9	Do you have a break out of the materials used in each process or facility area?						
1.9a	Where is this information kept?						

The DHA shall include the following: (1) Identification and evaluation of the process or facility areas where fire, flash fire, and explosion hazards exist, (2) Where such a hazard exists, identification and evaluation of specific fire and deflagration scenarios shall include the following: (a) Identification of safe operating ranges, (b)* Identification of the safeguards that are in place to manage fire, deflagration, and explosion events, (c) Recommendation of additional safeguards where warranted, including a plan for implementation [652:7.3.

The objectives stated in NFPA 61 Section 4.2 shall be deemed to be met when, consistent with the goal in 4.2.1 and the provisions in NFPA 61 Sections 1.4 and 1.5, the following has been achieved:
(1) The facility, processes, and equipment are designed, constructed, and maintained in accordance with the **prescriptive criteria set forth in this standard**.
(2) The management systems set forth in this standard are implemented.

If the material evaluated matches that of a typical food ingredient then use of the Prescriptive requirements found in NFPA 61 meets the minimum requirements for mitigation of the hazard. If not then best practice requires a Process Hazard Analysis or similar what-if based evaluation of each of the unusual ingredients used in the facility, and additional requirements may be needed to address and mitigate the higher hazard.

2.0 Building and Facility Design (NFPA 61, 8.2.0 - 8.2.6)		Yes	No	N/A	Comments	Action	Date Due

NFPA 70 defines location Hazard Class, Division and Group in chapter 500.5. Class II locations are those that are hazardous because of the presence of combustible dust. Division 1, the hazard is present in quanities sufficient to produce explosive or ignitible mixtures. Division 2, the hazard may be present under abnormal operations. Group G includes food and grain dusts. Unclassified is used to describe low hazard locations and areas with management and sanitation plans that prevent dust accumulation.

This assessment is a best practice and is seen as a method of understanding what flaws a current structure has in comparison to the previous NFPA 61 requirements.

2.1	Has the construction, modification, renovation, change of use, or change of occupancy classification of all buildings and structures complied with all governing building codes?						
2.2	Has a qualified person evaluated the facility and determined locations that are Class II, Group G, Division 1 or Division 2, and where the facility should be considered unclassified due to cleaning practices or absence of combustible dust?						
2.3	Has a drawing or map of the rated areas been developed?						
2.4	Where is this information kept?						
2.5	Are all areas determined to be Class II Div. 1 or 2, in full compliance with applicable requirements related to NEC 502?						
2.6	Does electrical wiring and power equipment meet all applicable requirements of NFPA 70, including those for hazardous locations, based on a review by a knowledgeable person?						
2.7	Are enclosures built to segregate dust explosion hazard areas from other areas designed such that they will not fail before the explosion pressure is vented to a safe outside location?						

2.8	Are there any areas classified as Class II, Group G, Division 1 that use masonry for the construction of exterior walls or roofs? If so, are the masonry walls designed for explosion resistance to preclude failure of these walls so the explosion pressure can be vented safely to the outside?						
2.9	Are structures housing personnel-intensive areas not directly involved in operations located remote from storage silos and headhouse structures, (exception of small control rooms) ?						
2.8	Are there any silos and headhouses constructed of reinforced concrete?						
2.9a	If 2.8 is yes: Are they separated from personnel-intensive areas by at least 30 m (100 ft)?						
2.9b	If 2.8 is yes: Do the structures have no inside elevator legs. If so, is the structure equiped with explosion venting or are the inside elevator legs equipped with explosion protection?						
2.10	Is a lightning protection system provided, and if so, is it in accordance with NFPA 780?						
2.11	Are there any areas where separation is used to limit the dust explosion hazard or deflagration hazard area within a building? If so, proceed to 2.13; if not, proceed to 2.15.						
2.12	Was the separation distance between the dust explosion or deflagration hazard area and surrounding exposures determined by an engineering evaluation, and is it at least 11 m (35 ft)?						
2.13	Is the separation area either free of dust, or where dust accumulations exist on any surface, is the color of the surfaces on which the dust has accumulated readily discernible?						
2.14	Are horizontal surfaces in the buildings minimized to prevent accumulations of dust in interior structural areas where significant dust accumulations could occur?						
2.15	Are storage areas larger than 465 m^2 (5000 ft^2) and containing packaging, bagging, palletizing, and pelleting equipment cut off from all other areas with fire barrier walls designed for a minimum fire resistance of 2 hours in accordance with Chapter 8 of NFPA 5000?						
2.16	Are warehouse areas designed in accordance with NFPA 5000?						
2.17	Are necessary openings in fire walls and fire barriers kept to a minimum and as small as practicable and protected with listed self-closing fire doors, fire shutters, fire dampers, or penetration seals installed in accordance with Chapter 8 of NFPA 5000?						
2.18	If Hold-Open devices are used, are they listed and designed to activate and allow the door to close upon sensing at least one of the following: (1) heat, (2) smoke, (3) flames, or (4) products of combustion?						
2.19	Is adequate means of egress provided in accordance with NFPA 101?						
2.20	Are bin decks provided with two means of egress remote from each other, such that a single fire or explosion event will not likely block both means of egress, or is the travel distance less than 15 m (50 ft) if only one means of egress is available?						
2.21	Do any MCC's require pressurization system and alarm installed per code?						
2.22	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
3.0 Ignition Source Control (NFPA 61, 8.5)		Yes	No	N/A	Comments	Action	Date Due
3.1	Has grounding and bonding of pipes and equipment been universally applied to the system and its components to assure static will be dissipated? (resistance to ground <= 1 megaohm)						
3.2	Do any motor-driven equipment meet requirements of NFPA 505 and sections 8.5.3.3.1 - 8.5.3.7?						
3.3	Are antifriction bearings used on all machinery, conveyors, legs, and processing equipment?						
3.4	Are bearings kept free from dust, product and excessive lubricant?						
3.5	Are bearings that are directly exposed to a dust deflagration hazard monitored for overheating?						
3.6	What form does the monitoring take? Describe the program or process and where information is kept.						
3.7	Are the bearings on legs, and conveyors located outside the machinery enclosures and protected from						
3.8	Are bearings accessable for inspection?						
3.9	Are screw conveyors and other similar equipment support bearings sealed ?						
3.10	Are pneumatic conveying systems installed in accordance with 8.5.3 and Sections 7.5 through 7.9 of NFPA 654?						
3.11	Are all system components electrically conductive?						

3.12	Is a Hot Work Program in place to prevent hot work in place for dust hazard rated areas to prevent Hot Work from being conducted, including the use of non-rated electric, pnuematic or powder driven tools, except when no dust producing operations are taking place and no combustible materials or dust is located in the vicinity of the operation? (See 21.30 - 21.44)						
3.13	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
4.0 Bins, Tanks, and Silo (NFPA 61, 8.2.7)		Yes	No	N/A	Comments	Action	Date Due
4.1	Does the Construction of bins, tanks, and silos conform to applicable local, state, or national codes?						
4.2	Where explosion relief vents are provided on bins, and tanks, are they rated to operate before the container walls fail?						
4.3	Do access doors or openings meet the following requirements: (1) They shall be provided to permit inspection, cleaning, and maintenance and to allow effective use of fire- fighting techniques in the event of fire within the bin, tank, or silo. (2) They shall be designed to prevent dust leaks.						
4.4	Where a bin, tank, or silo has a personnel access opening provided in the roof or cover, the smallest dimension of the opening shall be at least 610 mm (24 in.).						
4.5	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
5.0 Marine Towers (NFPA 61, 8.2.8)		Yes	No	N/A	Comments	Action	Date Due
Does the facility or process include Marine towers if yes, then complete section 5.0, if no skip to section 6.0							
5.1	Has the location of Marine Towers been included in the map and assessment in section 2.2 - 2.3?						
5.2	Are Marine towers constructed of noncombustible materials?						
5.3	Are movable marine towers provided with automatic or manually operated brakes?						
5.4	Are movable marine towers provided with automatic or manual rail clamps?						
5.5	Do rail clamps activated when the wind velocity is great enough to cause movement of the tower, even when brakes or gear drives are preventing the rail wheels from turning?						
5.6	Is equipment to monitor wind velocity installed on movable marine towers?						
5.7	Do movable marine towers have provisions for emergency tie-downs?						
5.8	For marine vessel loading, do conveyors, spouts, and drags have safety devices to prevent the equpment from falling if the operating cable(s) break?						
5.9	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
6.0 Conveyors, Spouts, and Throws of Material (NFPA 61, 8.3.2)		Yes	No	N/A	Comments	Action	Date Due
6.1	Are Bulk material conveyor belts designed to either relieve or stop if the discharge end becomes plugged?						
6.2	Are bulk material conveyor belts (grain handling, or similar) equiped with belt alignment and hot bearing sensors at the head and tail						
6.3	Are screw, drag, or en-masse conveyors fully enclosed in metal housings and designed to either relieve or stop if the discharge end becomes plugged?						
6.4	Are fixed spouts dust tight?						
6.5	Are combustable linings used in spouts or other handling equipment in any location other than wear points or impact points?						
6.6	Do ducts or conveyors that penetrate a fire-rated walls or partitions have necessary mitigation to prevent fire promagation from area to area?						
6.7	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
7.0 General Equipment Design (NFPA 61, 8.3.3.2)		Yes	No	N/A	Comments	Action	Date Due
7.1	Are any ingredient transport systems present in the process per NFPA 61, 3.3.22? (This system shall be permitted to be installed inside of a building without explosion protection where all of the following requirements are met: (1) The system is a negative or positive pressure pneumatic conveying system. (2) The system, through its design, is isolated from the addi-tion of mechanical or electrical energy and process activities, such as cooking or drying, by positive means, such as rotary valves, filters, normally closed valves, or sealed hoppers, from outside events that could trigger an event such as a flash fire or deflagration. (3) The system is not a bulk raw grain transportation pneumatic system or dust collection system.)						
7.2	Are magnets and screens located upstream of equipment and arranged where they can be easily inspected and cleaned?						

7.3	Are e-stops installed and routinely tested to ensure appropriate function?						
7.4	On normal shutdown of any process that contains combustable dust, does the system maintain design air velocity until the material is purged from the system?						
7.5	If a conveyor runs adjacent to buildings or structures of combustible construction or adjacent to walls with vents, windows, or spout or conveyor openings, are there seals, chokes, or fast-closing valves to minimize propagaion potential through these openings ?						
7.6	Are all connected fans suitable for material handling?						
7.7	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
8.0 Piping, Valves, and Blowers (NFPA 61 8.3.3.3)		Yes	No	N/A	Comments	Action	Date Due
Positive- and negative-type pressure systems are permitted. Where the blower discharge pressure and its conveying system are designed to operate at gauge pressures exceeding 103 kPa (15 psi), the system shall be designed in accordance with Section VIII of ASME Boiler and Pressure Vessel Code.							
8.1	Are all piping and tubing systems airtight, dusttight and grounded? (resistance to ground <= 1 megaohm)						
8.2	Are all piping and tubing systems properly supported to include the weightr of material in a full or choked position and can they be disassembled for cleaning and unchoking in a safe and effiecent manor?						
8.3	Are all pressure- and vacuum-relief valves located, designed, and set to relieve pressure to protect system components?						
8.4	Are multiple-direction valves of airtight and dust- tight construction and sized to effect a positive diversion of the product and does diversion in one direction seal all other directions from air, dust, or product leakage?						
8.5	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
9.0 Receiving and Shipping Conveyances (NFPA 61, 8.3.3.4)		Yes	No	N/A	Comments	Action	Date Due
9.1	Do all transport modes such as railcars (hopper cars, boxcars, or tank cars) and trucks (both receiving and shipping in bulk), into which or from which commodities or products that are potentially combustible are pneumatically conveyed, electrically bonded to the plant ground system or earth grounded? (resistance to ground <= 1 megaohm)						
9.2	Are all systems protected with filters on the inlet air used for transporting the combustable material pnuematicly?						
9.3	Are all trucks, railcars, and other containers being filled provided with filters designed to prevent dust liberation into the fill building or structure?						
9.4	Are unloading systems protected with magnets or magnet detection?						
9.5	Are receiving systems equipped with one or more devices such as grating, wire mesh screens, permanent magnets, listed electromagnets, pneumatic separators, or specific gravity separators, to minimize or eliminate tramp material from the product stream?						
9.6	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
10.0 Dust Collection Systems Prescriptive Requirements (NFPA 61, 8.3.3.5)		Yes	No	N/A	Comments	Action	Date Due
10.1a	Do any fans or blowers transport combustible dust through the fan or blower?						
10.1b	If Yes, are fans built of spark resistant construction?						
10.2a	Are any dust control devices attached to equipment that grind, pulverize, mill, or hammer mill food materials that are combustible isolated from other systems?						
10.2b	If no is the manifolded dust equipment only attached to equipment that is used for sizing of oilseed meals, or grain hulls?						
10.4	Does the dust collection system for hoppers and pits effectively control the dust and prevent it from leaving the system?						
10.5	Is the dust collection systems interlocked with related machinery so that it starts up before the machinery and prevents machinary operation when out of service?						
10.6a	Is there an alarm (visual or audible) that is tripped when a dust collection system collecting combustible dust is shutdown?						
10.6b	Does the alarm trigger a shutdown process?						
10.6c	If the collection system emergency vents or supression is activated by an explosion does the system shutdown?						
10.7	Is differential pressure across filter media tracked and is the media changed based on the readings observed?						
10.8	Are any dust bins or tanks that store grain dust located outside the building structure, constructed of non-combustable material, and isolated with rotory valves or similar from the other potions of the system?						

10.9	Are all dust collectors located outside the facility and isolated with rotory valves or similar from the other potions of the system? If yes, skip to 10.11						
10.10a	Do all dust collectors located inside the building have Defligration venting based on NFPA 68 and/or explosion suppression system based on NFPA 69?						
10.10b	If no, do these dust collectors handle only material generated as a biproduct to removing moisture from an air stream? (example coolers, extruders, wet grain flakes etc.)						
10.10c	If no, are these dust collectors located on the top of a bin and form a bin vent as defined in NFPA 61?						
10.10d	If no, are the filters used only for classifing of food products with air (air classifier or Purifiers)?						
10.10e	Is exhaust air from dust collectors/receivers returned to the building? If yes, see Section 14.						
10.11	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
11.0 Duct Systems Prescriptive Requirements (NFPA 61, 8.3.3.6)		Yes	No	N/A	Comments	Action	Date Due
11.1	Does the duct ever contain enough dust to support a deflagration- above 25% MEC?						
11.2	Does the system conveying velocity, as designed, ensure that the interior surfaces of all piping or ducting is free of accumulations under all normal operating modes?						
11.3	Are flexible connections static dissapative, bonded and grounded, resistance to ground <= 1 megaohm?						
11.4	Is the duct lining non-combustible?						
11.5	Are all ducts that return air to the building inspected and cleaned at least annually?						
11.6	Are isolation devices provided to prevent deflagration propagation from equipment through upstream ductwork to the work areas?						
11.7	Have ducts that handle combustible dust particulate solids been designed and installed so as to conform with the requirements of NFPA 91 with the execption found in NFPA 61?						
11.8	Have nonconductive materials such as plastic or fiberglass been avoided in all duct systems that could potenially handle combustable dust?						
11.9	Does the duct draw in air from spaces where there is combustible dusts in hazardous quantities?						
11.10	Are horizontal ducts provided with access openings for the removal of combustible dusts						
11.11	If isolation is used on the ductwork located inside of a building or structure, is the duct work designed to withstand the flame speed and pressure of an isolated event?						
11.12	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
12.0 Centralized Vacuum Cleaning Systems		Yes	No	N/A	Comments	Action	Date Due
Does the facility have a centralized Vacuum Cleaning System if yes, then complete section 11.0, if no skip to section 12.0							
12.1	On normal shutdown of the process, does the system maintain design air velocity until the material is purged from the system?						
12.2	Does the system provide minimum conveying velocities at all times, whether the system is used with a single or multiple simultaneous operators?						
12.3	If a fire detection system is incorporated into the centralized vacuum are safety interlocks in place for air-moving devices and process operations.						
12.4	If there are manifolded pick-ups on the central vacuum system, are they equipped with an isolation device?						
12.5	Are the central vacuum system hose stations located at strategic points (where dust emissions are known to occur)?						
12.6	Are only static-conductive vacuum cleaning tools used and are they properly grounded to the hose end?						
12.7	Is flexible hose properly grounded to prevent static build up?						
12.8	Are all vacuum truck hoses and couplings static dissipative, or conductive and grounded?						
12.9	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
13.0 Air-Material Separators		Yes	No	N/A	Comments	Action	Date Due
13.1	Are all Air-material separators connected to processes that are potential sources of ignition, such as hammer mills, ovens, and direct-fired dryers, and other similar equipment regardless of location protected by properly designed vents, or supression systems?						
13.2	Are interior separators protected so that explosion pressures will not rupture the ductwork or the device?						
13.3	Are there any devices on site smaller than 30 inches in diameter that are not protected because they meet the conditions found in NFPA 61 8.3.4.1.2?						
13.4	Are AMS that handle more than 25% of the MIE of any combustable dust protected with approprate explosion venting or inerting systems?						
13.5	Where is the explosion venting calculations or supression design information located?						

13.6	Is there a means of preventing deflagrations from propagating down the ducts of AMS that return air to a building?						
13.7	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
14.0 Recycling of Filtered Air (NFPA 61, 8.3.4.1.3)		Yes	No	N/A	Comments	Action	Date Due
Does the facility recycle air from Air-Material Separators? if yes, then complete section 13.0, if no skip to section 14.0							
14.1	Is the Air that is returned inside the building or to air makeup systems filtered to the efficiency of 0.02 g per dry standard cubic meter of airflow (0.008 grain per dry standard cubic foot of airflow)?						
14.2	Is the air from hammer mill filters or other devices that add energy to the system discharged outside the facility?						
14.3	Is the collector or exhaust system provided with explosion suppression or isolation to prevent deflagration from the collector from entering the building? ?						
14.4	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
15.0 Bucket Elevator Legs (NFPA61, 8.3.7)		Yes	No	N/A	Comments	Action	Date Due
Does the facility have fully enclosed bucket elevators or lifts that handle plausable combustible dust hazard materials, if yes, then complete section 15.0, if no skip to section 16.0. Note: **Finished Breakfast Cereal** Product transported in open bottom lifts would be an example of a material **NOT** affected by this section.							
15.1	Any bucket elevators located fully or partially inside of a building, structure or tunnel?						
15.2	Are Bucket elevators that move combustible materials that could generate dust hazard (casing, head and boot sections, access openings, and connecting conveyances) dusttight and constructed of noncombustible materials?						
15.3	Is explosion venting or suppression provided for each elevator leg?						
15.4	If not, is isolation provided on the feed and discharge end with deflagration isolation in accordance with NFPA 69?						
15.5	Is each leg independently driven by motor(s) and drive train(s) capable of handling the full-rated capacity of the elevator leg without overloading?						
15.6	Are each leg independently driven by motor(s) and drive train(s) capable of handling the full-rated capacity of the elevator leg without overloading?						
15.7	Are line shaft drives capable of handling the full-rated capacity of all connected equipment without overloading?						
15.8	Are multiple motor drives shall be interlocked to prevent operation of the leg upon failure of any single motor?						
15.9	Can drive start an unchoked leg under full (100 percent) load?						
15.10	Is each leg provided with a speed sensor device that will cut off the power to the drive motor and actuate an alarm in the event the leg belt slows to 80 percent of normal operating speed and will feed to leg be stopped or diverted?						
15.11	Has proper lagging been installed on system pullies and related devices?						
15.12	Have proper monitoring equipment been installed to assure hot bearings, misalignment and other abnoraml conditions before the conditions can cause a danerous condition to exisit?						
15.13	Are all spouts intended to receive grain or combustible dust hazard materials directly designed and installed to handle the full-rated elevating capacity of the largest leg feed- ing such spouts?						
15.14	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
16.0 Processing Machinery and Equipment		Yes	No	N/A	Comments	Action	Date Due
16.1	Are receiving systems prior to elevator legs equipped with one or more devices such as grating, wire mesh screens, permanent magnets, listed electromagnets, pneumatic separators, or specific gravity separators?						
16.2	Are tributary spouts or conveyors that feed grain or grain products for size reduction into grinders, pulverizes, or rolling mills equipped with permanent magnets, listed electromagnets, pneumatic separators, specific gravity separators, scalpers, or screens to exclude metal or foreign matter?						
16.3	Is equipment bonded and grounded?						
16.4	Are processing machinery and components, such as magnets, mounted to facilitate access for cleaning?						
16.5	Are screw, drag, and en-masse conveyors fully enclosed and designed to either relieve or stop if the discharge end becomes plugged.						
16.6	For starch grinding mills, is carbon steel avoided in the grinding chamber and for moving parts?						
16.7	Are the reels or sieves of screens, scalpers, and similar devices shall be in dusttight enclosures?						

16.8	Are connecting ducts for starch processing machinery either metal or electrically conductive, nonmetallic, flexible connecting ducts having an electrical resistance not greater than 1 megaohm?						
16.9	Where multiple starch material sources are connected to a common conveyor, air-material separator, or similar device, is each connected source equipped with deflagration isolation in accordance with NFPA 69?						
16.10	Is dry milling or grinding of starch performed in a separate building with explosion relief or in a separate room isolated from other areas by interior walls designed not to fail before explosion pressure is vented to a safe, outside location? OR, is the grinding equipment designed to be protected in accordance						
16.11	Have all elevator legs handling Bulk raw grain been assesed based on 8.3.7.2?						
16.12	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
17.0 Grain and Spray Dryer (NFPA 61, 8.3.9.2-8.3.9.5)		Yes	No	N/A	Comments	Action	Date Due
Does the facility have grain or Spray dryers if yes, then complete section 16.0, if no skip to section 17.0							
17.1	Are each of the key equipment types designs been assessed based on requirements of NFPA 61, Chapter 8.3.9?						
17.2	Are there any deficient or non conforming items identified? If yes was a plan written with estimated						
18.0 Heat Transfer Operations (NFPA 61, 8.3.10)		Yes	No	N/A	Comments	Action	Date Due
Does the facility have any Heat transfer Operations if yes, then complete section 17.0, if no skip to section 18.0							
18.1	Are heat transfer devices utilizing air, steam, or vapors of heat transfer fluids provided with pressure-relief valves where necessary?						
18.2	Are relief valves on systems employing combustible heat transfer media vented to a safe, outside location?						
18.3	fluids located in a separate, dust-free room or building						
18.4	Is air for combustion taken from a clean, outside source?						
18.5	Are enclosures for heat exchangers constructed of noncombustible materials and equipped with access openings for cleaning and maintenance.						
18.6	Are heat exchanges located and arranged in a manner that does not allow combustible dust to accumulate on coils, fins, or other heated surfaces?						
18.7	Are heat exchangers interlocked to shut down the heater and fluid transfer pumps upon activation of the fire protection and/or deflagration protection systems for any areas served by this system?						
18.8	Are heating units provided with a source of combustion air ducted directly from the building exterior or from an unclassified location?						
18.9	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
19.0 Ventilation and Venting (NFPA 61.11)		Yes	No	N/A	Comments	Action	Date Due
19.1	Are each of the key equipment types designs been assessed based on requirements of NFPA 61, Chapter 8.3.11?						
19.2	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
20.0 Mitigation							
Dust Control		Yes	No	N/A	Comments	Action	Date Due
20.1	Are each of the key equipment types designs been assessed based on requirements of NFPA 61, Chapter 8.7?						
20.2	Are there any deficient or non conforming items identified? If yes was a plan written with estimated						
Explosion Prevention/Protection		Yes	No	N/A	Comments	Action	Date Due
20.3	Are each of the key equipment types designs been assessed based on requirements of NFPA 61, Chapter 8.8?						
20.4	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
Fire Protection		Yes	No	N/A	Comments	Action	Date Due
20.5	Are each of the key equipment types designs been assessed based on requirements of NFPA 61, Chapter 8.9?						
20.6	Are there any deficient or non conforming items identified? If yes was a plan written with estimated dates for bringing structure into compliance with this set of requirements?						
21.0 Human Factor		Yes	No	N/A	Comments	Action	Date Due
21.1	Does the facility have a sanitation program that includes cleaning and equipment integrity assessment based on dust releases and accumulations?						
21.2	Are all areas shown in item 2.3 rated as unclassified due to equipment design and maintenance to prevent or limit dust releases, including a sanitation program that calls for frequent cleaning to assure they meet the requirements to remain unclassified?						
21.3	Does the sanitation program include requirements of NFPA 61, Chapter 8.4 housekeeping?						

21.4	Are Motor Control Centers (MCCs) pressurized to prevent dust infiltration? If not, are they arranged to limit dust infiltration combined with an effective program in place to keep the room and cabinets free of dust accumulations.						
21.5	Does the housekeeping program address combustible dust accumulations at the following priority areas: (A) Floors of enclosed areas containing grinding equipment? (B) Floor areas within 10.7 m (35 ft) of inside bucket elevators? (c) Floors of enclosed areas containing dryers located inside the facility?						
21.6	Are dust accumulations on ledges, walls, rafters, beams, ducts, and ceiling surfaces in identified priority areas maintained below acceptable limits [e.g., 0.32 cm (1⁄8 in.)]?						
21.7	Is there a plant hazard awareness training program and does it include the hazards associated with dust, dust accumulation and deflagration?						
21.8	Where the plant programs and records of inspection and training kept?						
21.9	Is smoking allowed in your facility? If yes where?						
21.10	Are combustible dust hazard area identification procedures in place and are all hazardous areas identified to employees and contractors (e.g., by sign, map, other reference)?						
21.11	Does the facility require that before any activity that could cause dust to be suspended in air such as the use of compressed air during cleaning of ledges, walls, beams, ducts, and surfaces that all nonrated electrical be deenergized and all other known sources of ignition have been removed or controlled?						
21.12	Has a formal preventative maintenance program been established for dryers, dust collectors, flexible connectors, differential pressure gauges, bucket elevators, and any other dust handling/producing/processing equipment that specifically includes the verification of grounding and bonding?						
21.13	Are all critical safety systems inspected, tested, and/or calibrated per the OEM guidelines (as required by process safety assessment and NFPA facility standard)?						
21.14	Are all bearings maintained per the manufacturers' instructions or internal predictive maintenance program and kept free of combustible dust, product, and excessive lubrication?						
21.15	Is there a contractor safety training program and does it include awareness of the plants dust hazards, hot work program, no smoking requirements per NFPA and other requirements?						
21.16	Is there training for operators, maintenance, and contractors on how to use and repair the central vacuum system?						
21.17	Is means of fire-fighting, to include the use of water as an extinguishing agent, covered in operator, maintenance, and contractor training?						
21.18	Are portable vacuums used for cleaning up combustible dusts listed for use in Class II areas?						
21.19	If a portable vacuum is used, is it a conductive system?						
21.20	If a portable vacuum is used, are the hoses conductive and grounded, or static disipative?						
21.21	If a portable vacuum is used, is the fan protected from dust laden air, by a filter?						
21.22	If an electric portable vacuum is used, is the motor rated for a Class II, Div 1 location?						
21.23	Is there training for operators, maintenance, and contractors on how to use and repair the portable vacuum systems?						
21.24	Is the portable vacuum used only for dry particulate solids so that the filter is always in place?						
21.25	Is there training for operators, maintenance, and contractors on how to use and repair the portable vacuum system? For examples: conductive tools and making sure that the exhaust dust does not disperse and suspend layers of dust deposits in the area.						
21.26	Does combustible dust accumulate on the overhead ductwork so that it could support a deflagration if dispersed?						
21.27	When a branch line is disconnected, blanked off, or otherwise modified, is the design of the entire system verified to ensure the whole system operates effectively?						
21.28	Is verifying that the ductwork is clean of combustible dusts a pre-requisite of issuing hot work permits?						
21.29	Is there a hot work procedure in place before welding or cutting on ducts?						
21.30	Does maintenance and contract maintenance receive training to recognize that hot work produces localized heating of equipment and piping, as well as sparks, which can cause dust fires and explosions?						
21.31	Does the hot work permit reflect the intent of NFPA 51 B?						
21.32	Is a new permit issued for every shift of hot work?						

21.33	Is equipment undergoing hot work always taken out of service and kept inoperable until the work is complete and cooled?						
21.34	Have all hazards been cleared internally and externally from the equipment prior to commencing hot work?						
21.35	Are all ignitable materials within 11 m (35 ft) removed or protected?						
21.36	Are all combustible dust layers within 11 m (35 ft) removed by cleaning prior to commencing hot work?						
21.37	Has the area been checked for ignitable vapors and gasses?						
21.38	Are floors and structures in the work area covered with fire-proofed material or adequately wetted with water?						
21.39	Are welding shields present, if required to protect passersby?						
21.40	If sparks could travel to an adjacent room, through cracks or openings, have combustible materials all been moved or protected?						
21.41	Will any fire protection or detection systems be disabled as a result of this hot work? Is an active fire-watch available if so?						
21.42	Is a trained fire watch present during and for 60 min after the hot work is completed?						
21.43	Are regular inspections of the work area shall be made to ensure that no smoldering fires develop, including a final inspection performed prior to closing the area for the day or weekend.						
21.44	Have people responsible for the hot work operations receive documented training to: (1) Inspect the proposed work area to determine that the conditions of the permit system have been met (2) Designate additional precautions as deemed necessary (3) Sign the permit to authorize the work to begin						
21.45	Is combustible dust training provided annually to staff involved in facility design and operation, including plant engineering, and maintenance?						
21.46	Are contractors informed of all known/potential hazards related to their work as well as site safety rules to reduce combustible dust fire and explosion hazards, including, but not limited to, emergency action plans, hot work permits, avoiding potential ignition sources, grounding requirements, cleaning out of combustible material before commencing work, and prohibition of smoking in hazardous areas?						