National Fire Protection Association
The authority on fire, electrical, and building safety

NFPA Combustible Dust Standards

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Program Outline

- NFPA standards making process – how to participate
- Overview of combustible dust and explosion protection standards
- NFPA 652 – overview of new fundamentals standard
- NFPA 61 – Agricultural Dust Standard
- Closing and questions

Who is NFPA?

- Founded in 1896
- Independent
- Mission Driven
- Not-for-profit (501(c)(3))
- Membership Organization— over 60,000 members
  - Members in 118 Nations
  - 11 Membership Sections
- Voluntary Codes & Standards Developer (SDO)
- ANSI Accredited Organization
- International Recognition (ISDO)

Who is NFPA and What does NFPA do?

Mission: "We help save lives and reduce loss with information, knowledge, and passion."

Vision: "We are the leading global advocate for the elimination of death, injury, property and economic loss due to fire, electrical and related hazards."

NFPA Standards Making Process

- Voluntary consensus standards developing organization (SDO)
  - Adoption through state or local fire and building codes
  - Fire codes in all 50 states (ICC IFC or NFPA 1)
  - Incorporation by reference into federal regulations
    - Not currently combustible dust standards
- Developed by technical committees served by over 5000 volunteers
  - Process is open – anyone can attend meetings and propose changes

Accessing NFPA Document Information Pages

- Home page
  - www.nfpa.org
  - Codes and Standards tab
  - List of documents
- From web browser
  - www.nfpa.org/61
- Next edition tab

Document information page

NFPA 652: STANDARD ON COMBUSTIBLE DUSTS

Current Edition: Proposed Standard Next Edition: 2015

Alerts: Receive e-mail updates on this document. Manage my alerts

Committee members: Sign-in to view your documents.

Document information | Next edition | Technical Committee | Technical Questions | Products & Training | Community

Revision cycle information

Revision Cycle: Fall 2014
Revised Edition Date: 2015

First Draft (previously Report on Proposals (ROP))

Public Input Closing Date: 1/4/2013
Public Input form (word)
First Draft Report Posting Date: 9/6/2013
Preliminary Draft (PDF, 1.3 MB)

Second Draft (previously Report on Comments (ROC))

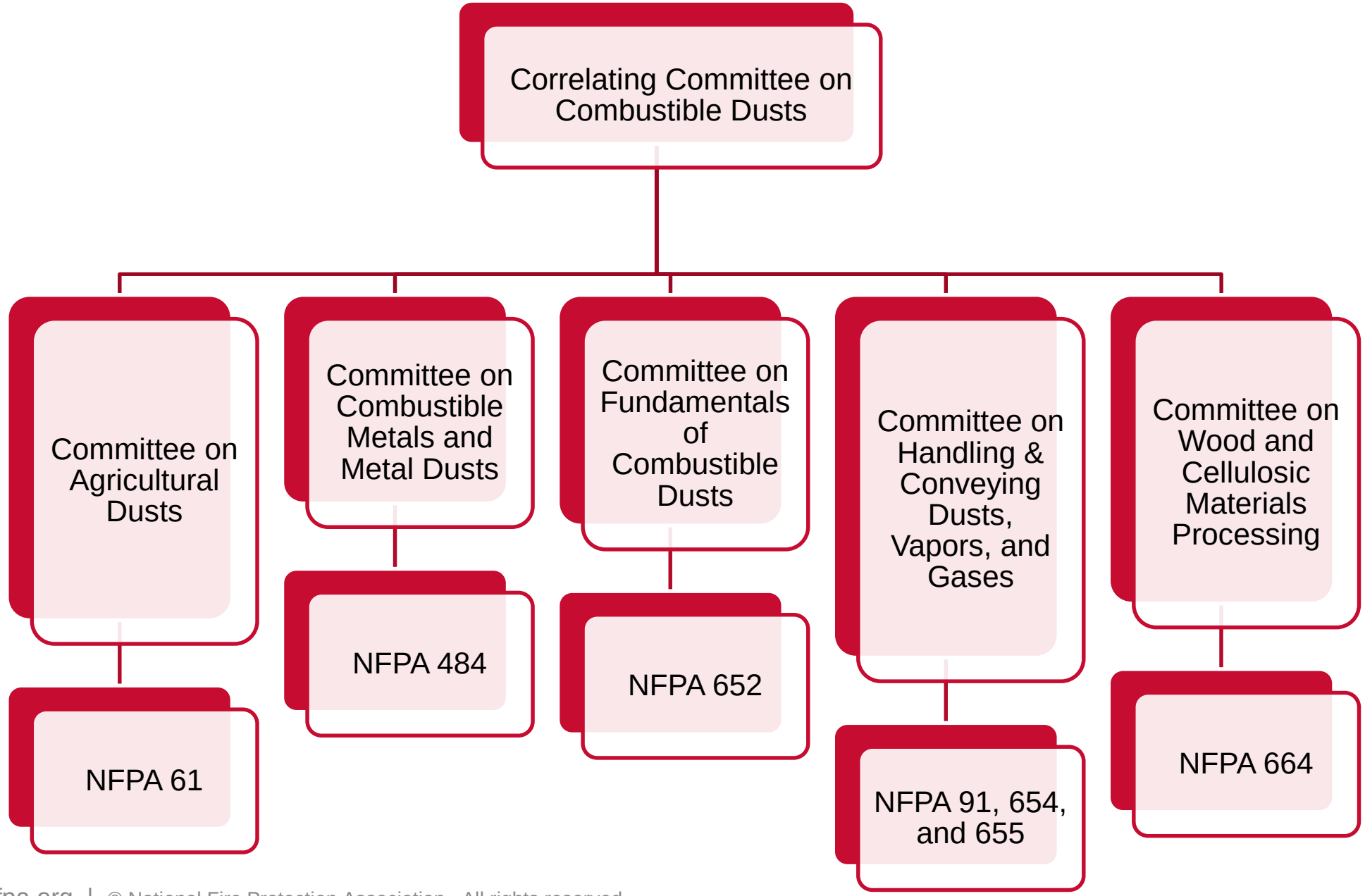
Public Comment Closing Date: 11/15/2013
Second Draft Report Posting Date: 7/18/2014

Notice of Intent to Make a Motion (NITMAM)

NITMAM Closing Date: 8/22/2014
NITMAM Posting Date: 10/17/2014

Industry or Commodity-Specific NFPA Standards

- NFPA 61, Agricultural and food processing
- NFPA 484, Combustible metals
- NFPA 654, Combustible Particulate Solids
- NFPA 655, Sulfur
- NFPA 664, Wood processing & woodworking



Dust and Explosion Protection Standards – Revision Cycles

NFPA Document	Revision Cycle	Status
NFPA 652	Annual 2018	2016 edition issued Sept 15. First Draft meeting August 2016
NFPA 67	Fall 2018	2016 edition issued fall 15. Public Input closes 1/5/2017 for next cycle
NFPA 69	Fall 2018	Public input closes 1/5/2017 for next cycle
NFPA 61, 654, and 664	A2016	2017 editions issued May 2016
NFPA 484	Annual 2018	First draft in process
NFPA 68	Fall 2017	First draft meeting complete

OSHA

- Currently, no federal standard for general industry that addresses comprehensive safeguards to protect workers from combustible dust fire and explosion hazards
- Proposed rule – October 2009
- National Emphasis Program (NEP) – March 2008
  - Uses NFPA combustible dust standards for reference in identifying hazards and to establish that feasible means for hazard abatement exists
  - Cannot cite employer for not complying with NFPA standards as these have not been adopted
- Hazard Communication Standard (29 CFR 1910.1200) revised March 2012 to include combustible dust in definition for hazardous chemical

Fundamental Safeguards Against Combustible Dust Fire and Explosion Hazards

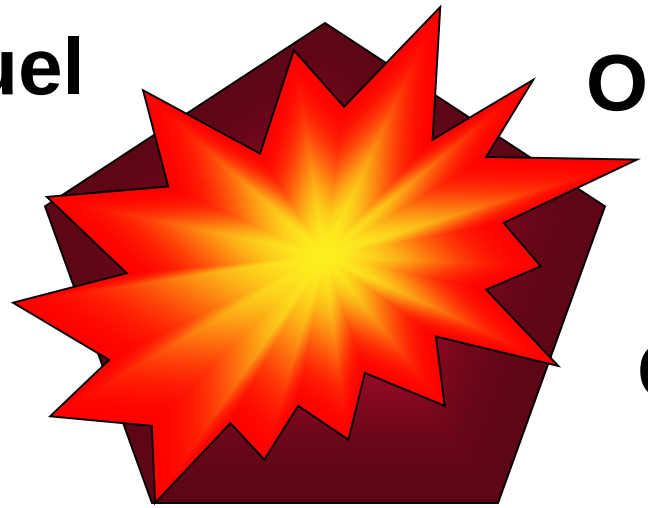
- If the solid is, or can form, a combustible dust, then establish one or more of the following protections:

1. Control the fuel – limit the generation or formation of the dust, its release, and its accumulation
2. Control ignition sources – identify potential ignition sources and keep ignition sources from the dust (either dust clouds or dust layers)
3. Limit the spread of any combustion event – if propagating combustion occurs, use construction features or explosion protection and prevention measures (venting, isolation, suppression) to prevent extensive spread of the combustion zone

Where Can You Find Explosible Dust Concentrations?

- Dust collectors
  - Bag and cartridge filters
  - Cyclones
- Grinders/hammermills
- Blenders
- Silos
- Conveyor transfer points
- Rail car and truck loading/unloading stations
- Bulk bag filling and unloading stations

Dust Explosion Principles



The Explosion Pentagon

NFPA 652 – Standard on Combustible Dusts

- Scope – provide the basic principles of and requirements for identifying and managing the fire and explosion hazards of combustible dusts and particulate solids
- Purpose - provide the user with general requirements and direct the user to the appropriate industry or commodity-specific NFPA standard for additional requirements

NFPA 652 Outline

- Chapters 1, 2, 3 – standard format
- Chapter 4 – General Requirements
- Chapter 5 – Hazard Identification
- Chapter 6 – Performance-Based Design Option
- Chapter 7 – Dust Hazards Analysis
- Chapter 8 – Hazard Management Mitigation and Prevention
- Chapter 9 – Management Systems

Application

- Apply to facilities and operations manufacturing, processing, blending, conveying, repackaging, generating, or handling combustible dusts or combustible particulate solids.

Application

- Shall not apply to the following:
  - Storage or use of consumer quantities
  - Storage or use of commercially packaged materials at retail facilities
  - Display of materials in original packaging in mercantile occupancies
  - Warehousing of sealed containers
  - Storage or use of materials used in farm buildings

Conflicts

- Define industry or commodity-specific NFPA standards
- If requirement in industry or commodity-specific differs from NFPA 652, the industry or commodity-specific shall be permitted to be used
- If requirement in industry or commodity-specific prohibits requirement in NFPA 652, prohibition shall be applied

Conflicts

- If industry or commodity-specific neither prohibits or provides a requirement, the requirement in NFPA 652 applies
- If conflict between general requirement in NFPA 652 and specific requirement in NFPA 652, the specific requirement applies

Retroactivity

- General statement in all NFPA documents
- Some specific requirements are retroactive
  - Housekeeping
  - Employee training
  - Management of change
- Redesign of a facility is not retroactive

Dust Hazards Analysis

- A systematic review to identify and evaluate the potential fire, flash fire, or explosion hazards associated with the presence of one or more combustible particulate solids in a process or facility.

Chapter 4 – General

- Facility owner/operator with potentially combustible dust responsible for:
  - Determine combustibility and explosibility hazards
  - Identifying and assessing any fire, flash fire, and explosion hazards
  - Managing the identified hazards
  - Communicating the hazards

Chapter 5 – Testing

- Screening for combustibility or explosibility
- Determination of combustibility or explosibility by either:
  - Historical facility data or published data deemed to be representative of current materials and process conditions
  - Analysis of representative samples
  - Absence of prior incidents not to be used as basis for deeming a particulate to not be combustible or explosible

Chapter 5 – Sample Collection

- Sampling plan
- Mixtures
- Representative samples
- Sample collection
  - Safety considerations include introduction of ignition source, dispersal of dust, risk of injury to workers

Chapter 7 – Dust Hazards Analysis (DHA)

- Requirements of Chapter 7 to be applied retroactively
  - Existing processes/facility compartments undergoing modification, complete DHA as part of project
  - Existing process/facility compartments schedule and complete DHA within 3 years
    - Not intended to permit delay in completion

Chapter 8 – Hazard Management: Mitigation and Prevention

- Building design
- Equipment design
- Housekeeping
- Ignition source control
- Personal protective equipment
- Dust control
- Explosion prevention/protection
- Fire protection

Chapter 9 – Management Systems

- Operating procedures and practices
- Inspection, testing, and maintenance
- Training and hazard awareness
- Contractors
- Emergency planning and response
- Incident investigation
- Management of change
- Document retention
- Management systems review

NFPA 61

- Standard dates back to 1923
- Applies to
  - 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.
  - 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
  - Those seed preparation and meal-handling systems of oilseed processing plants not covered by NFPA 36

NFPA 61 Organization

- Chapters 1,2,3 – Administration, References, and Definitions
- Chapter 4 - General Requirements
- Chapter 5 - Hazard Identification
- Chapter 6 - Performance-Based Design
- Chapter 7 - Dust Hazards Analysis (DHA)
- Chapter 8 – Hazard Management: Mitigation and Prevention
- Chapter 9 – Management Systems

Correlation with NFPA 652

- Definitions have been reviewed to align with 652
- Material added on owner/operator responsibilities
- Objectives added to align with the other dust documents
- Performance based design is now an alternative

Chapter 5 – Hazard Identification

- Owner/operator must determine if material is combustible or explosible
- Characterizing properties to support the DHA
- Methods for determining combustibility or explosibility
- Additional annex material

Chapter 7 – Dust Hazards Analysis

- Requirements apply retroactively
- New processes and those undergoing significant modifications - DHA as part of the process
- Bucket Elevators, Conveyors, Grinding Equipment, Spray Dryer Systems, and Dust Collection Systems within five years
- Significant modification is defined as exceeding 25% of the replacement cost of the system.

Chapter 7 – Dust Hazard Analysis

- Evaluate hazards and provide recommendations to manage hazards
- Performed by a qualified person
- Results and action items documented
- Examples
  - Annex B in 652 for new processes
  - Annex F in 61 for checklist example for existing processes

Chapter 8 – Hazard Mitigation and Prevention

- Building Design
- Equipment Design
- Housekeeping
- Ignition Source Control
- Personal Protective Equipment
- Dust Control
- Explosion Prevention/Protection
- Fire Prevention

Chapter 9 - Management Systems

- Operating Procedures and Practices
- Inspection, Testing, and Maintenance
- Training and Hazard Awareness
- Contractors
- Emergency Planning and Response
- Incident Investigation
- Management of Change
- Document Retention
- Management System Review
- Employee Participation
- Storage of Oils, Flammable Liquids, and LPG
- Warning Signs
- Miscellaneous Storage

Next Steps

- Three documents have just completed Second Draft, targeting adoption next June
- Fundamentals document recently issued
- Intended outcome of Correlating Committee is starting to take effect
- Long Term: Does NFPA envision one dust standard?

THANK YOU!

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Any Questions?