JASON KRBEC

CV TECHNOLOGY
FIRE AND EXPLOSION PROTECTION

NFPA 660

NFPA®

UPCOMING CHANGES AND WHAT THEY MEAN FOR COMBUSTIBLE DUST SAFETY

EXPERTS TO HELP YOU NAVIGATE SAFETY REGULATION APPLICATION

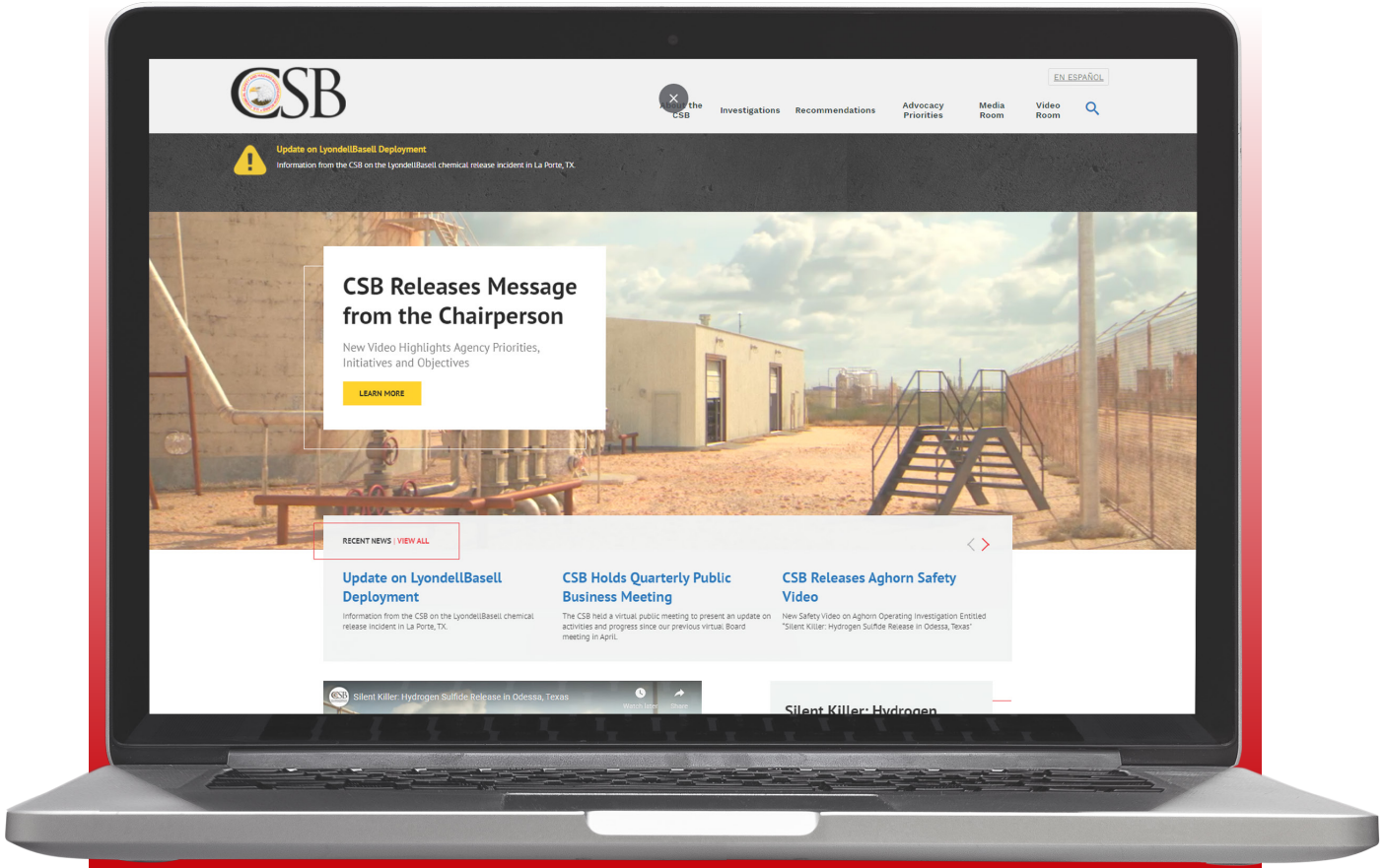
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA is a non-profit organization
- NFPA is not affiliated with the government or enforcement/policies
- Go to NFPA website for the latest up to date information www.nfpa.org

CONSOLIDATION OF THE NFPA DUST STANDARDS

- The NFPA Standards related to combustible dust are in the process of being consolidated into a new Code
- New combined Code to take the number of NFPA 660
- The current model of Combustible Dust Standards is a split based on industry- or commodity- specific segment
- A long history of combustible safety has led us here.....

CHEMICAL SAFETY BOARD



Independent federal agency that investigates chemical accidents

From 2006-2017 they have documented 59 fatalities and 303 injuries in Combustible Dust incidents

Issued recommendations of proposed rulemaking for combustible dust hazards to OSHA in 2007

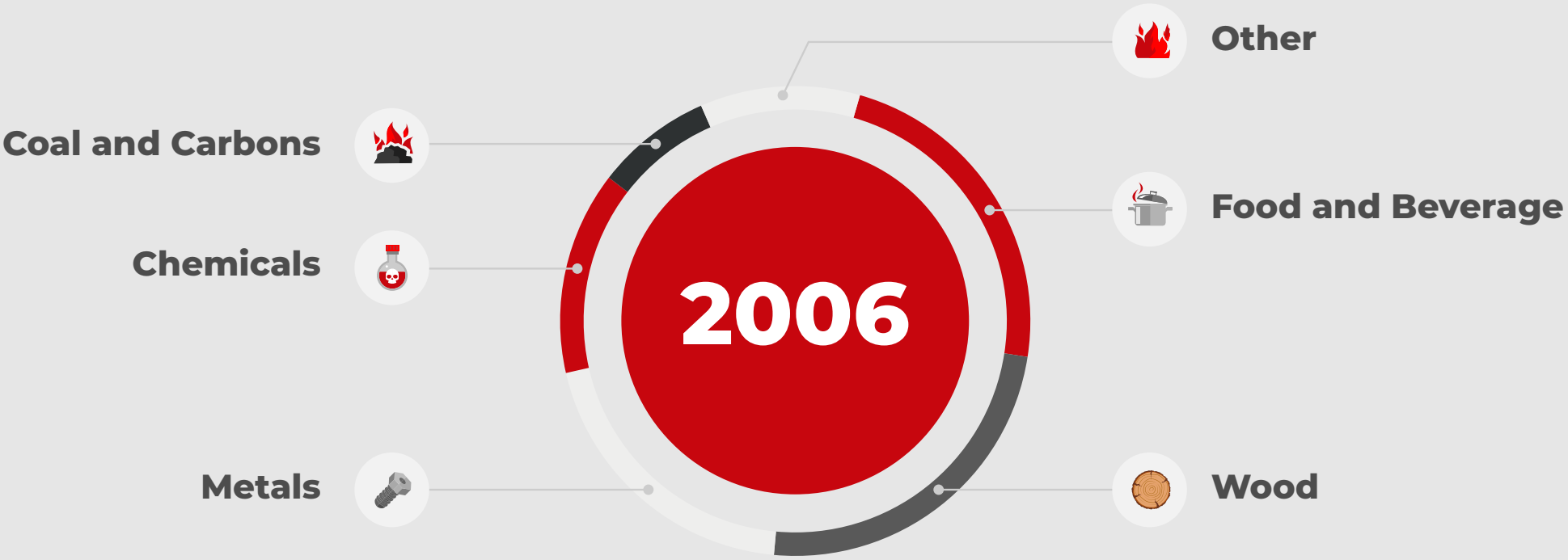
www.csb.gov

1980-2012

148 fatalities

879 injuries

COMBUSTIBLE DUST INCIDENT BY INDUSTRY



Coal and Carbons
Coal
Cement
Carbon Black

Metals
Raw Metal
Metal Parts
3D Printing

Wood
Board
Wood Pellet
Woodworking
Sawmill

Food and Beverage
Grain and Feed
Bakery and Snack
Pet Food
Dairy

Chemicals
Plastics
Specialty Chemical
Resins

Others
Specialty Items
Mixtures

Source: **2006 CSB Study**

COMBUSTIBLE DUST INCIDENT BY INDUSTRY

Coal and Carbons
Coal
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Food and Beverage
Grain and Feed
Bakery and Snack
Pet Food
Dairy

Chemicals
Plastics
Specialty Chemical
Resins

Others
Specialty Items
Mixtures

Source: **2018 CSB Study**

COMBUSTIBLE DUST INCIDENT BY INDUSTRY

Coal and Carbons	Metals	Wood	Food and Beverage	Chemicals	Others
Coal	Raw Metal	Board	Grain and Feed	Plastics	Specialty Items
Cement	Metal Parts	Wood Pellet	Bakery and Snack	Specialty Chemical	Mixtures
Carbon Black	3D Printing	Woodworking	Pet Food	Resins	
		Sawmill	Dairy		

Source: **2019 DSS Incident Report**

“DRIVER OF CRITICAL CHEMICAL SAFETY CHANGE.”

The CSB has issued four recommendations to OSHA calling for the issuance of a comprehensive general industry standard for combustible dust as the Board’s first:

BACKGROUND

NFPA STANDARDS AND OSHA HISTORY

- **OSHA NEP** released in 2007
- **NEP** refreshed again in 2008 (Imperial Sugar)
- **NFPA** started the process for a better Standard on combustible dust

STAKEHOLDER MEETINGS

OSHA held a series of Stakeholder Meetings following the NEP release and notice of proposed rulemaking (2009-2011)

> ***NFPA 654 is a good starting point. However, OSHA should not focus solely on NFPA 654 given that many other standards are involved.***

> ***Many NFPA standards are unclear, and often small businesses do not know that their facilities have a problem. Liability insurers could be a key element to the process by explaining the standards to small businesses in a way that they can understand and implement.***

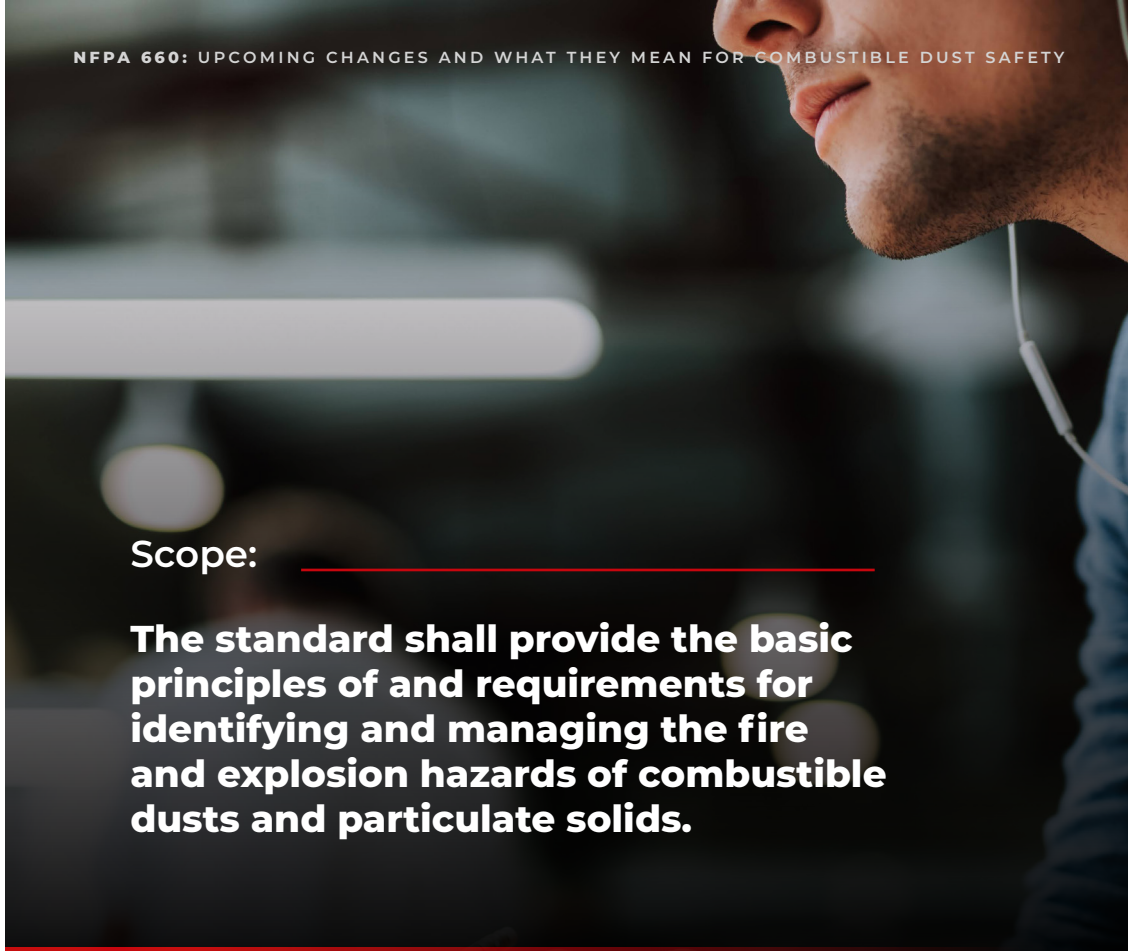
> ***NFPA guidelines are complex and do not use consistent language (different committees write different sections). OSHA should use more straightforward and cohesive language to explain what is required.***

NFPA 652

THE GAME CHANGER

NFPA 652 Standard on Combustible Dust

Released September 2015



Scope:

The standard shall provide the basic principles of and requirements for identifying and managing the fire and explosion hazards of combustible dusts and particulate solids.

- Specific Chapter structure and introduction of retroactive requirements.
- All other standards have revised to match the 652 format and chapter structure.
- Correlating Committee also formed to oversee all “Dust Standards”.

CORRELATING COMMITTEE

Correlates between the industry specific standard and the fundamental standard

Goal is to have continuity between combustible dust standards:

Definitions	Structure	References

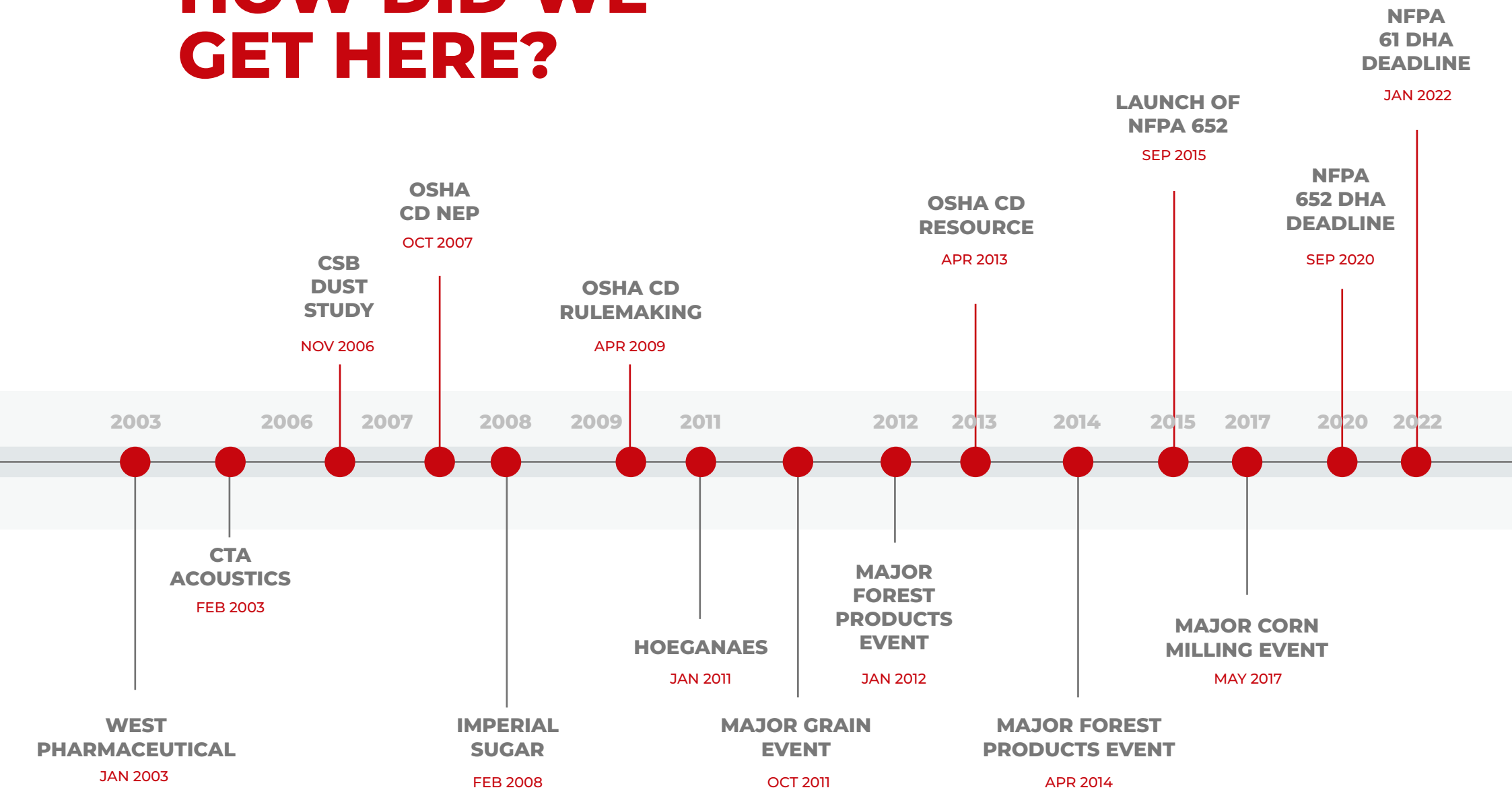
DUST HAZARD ANALYSIS (DHA)

NFPA 652 introduced the Dust Hazard Analysis (DHA)

Critical requirement that has improved combustible dust safety and awareness

Deadlines started within NFPA Standards to complete DHA's based on the industry

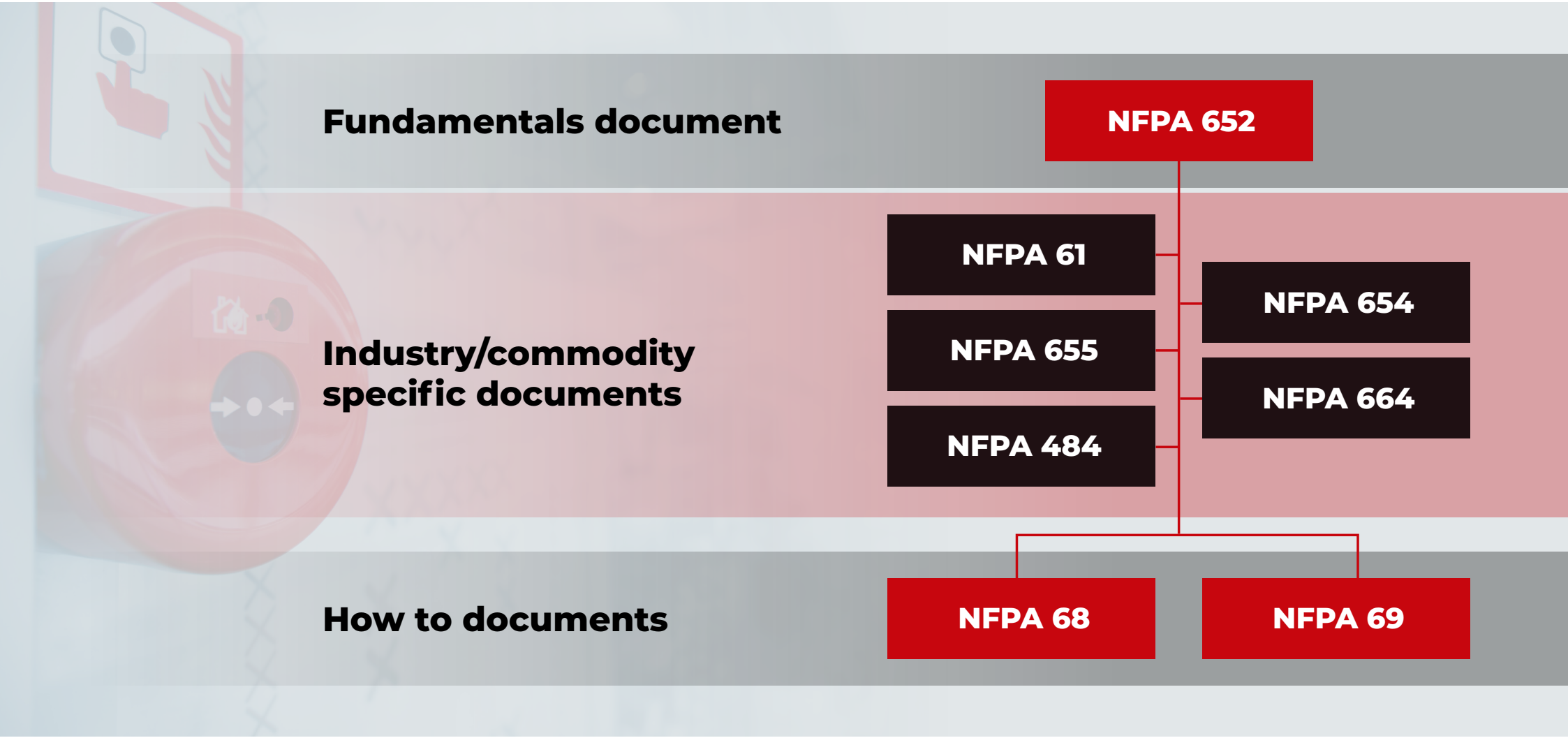
HOW DID WE GET HERE?



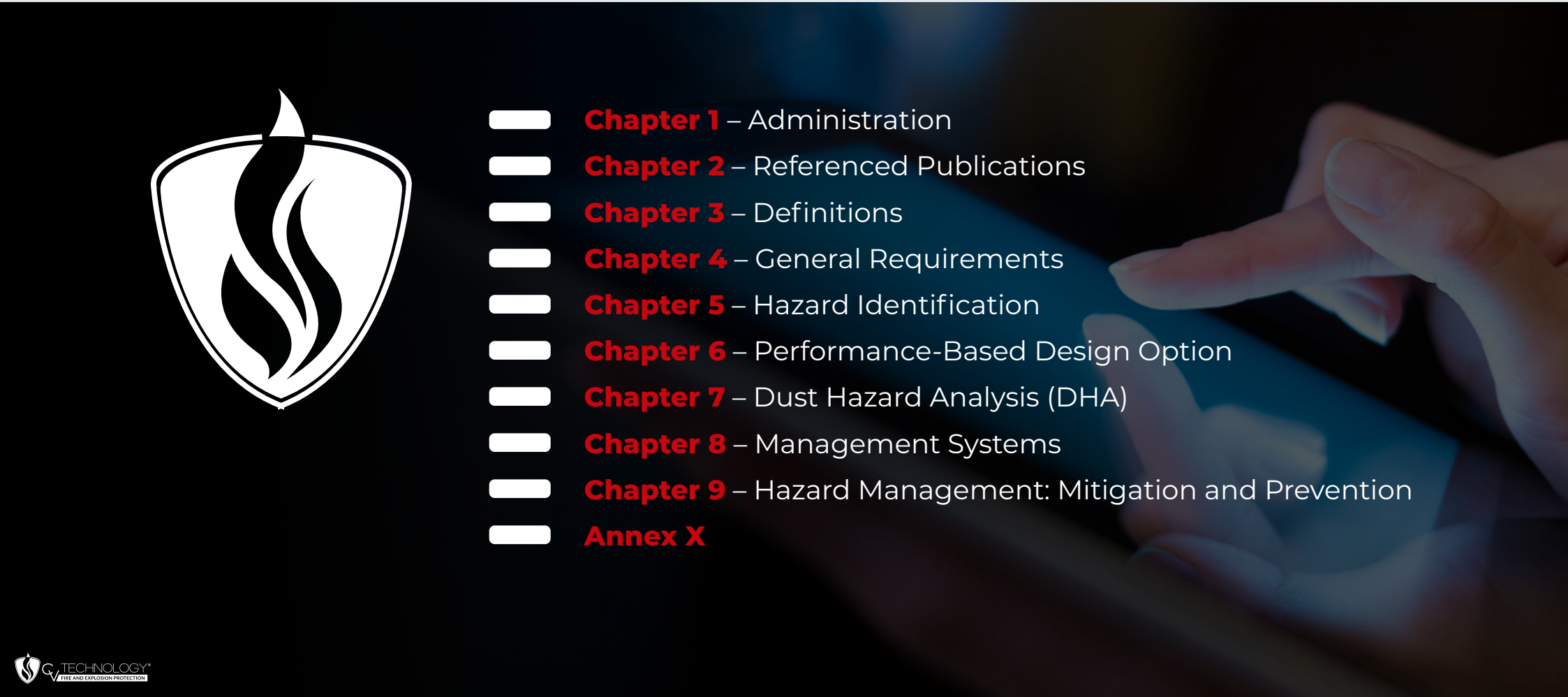
NFPA COMBUSTIBLE DUST STANDARDS

- **NFPA 652**
  Fundamentals of Combustible Dust
- **NFPA 654**
  Chemicals and Plastics Other industries as well
- **NFPA 61**
  Agricultural or Food Products
- **NFPA 655**
  Sulfur
- **NFPA 484**
  Metals and Alloys
- **NFPA 664**
  Wood and Wood Processing

NFPA STANDARD USAGE FLOW

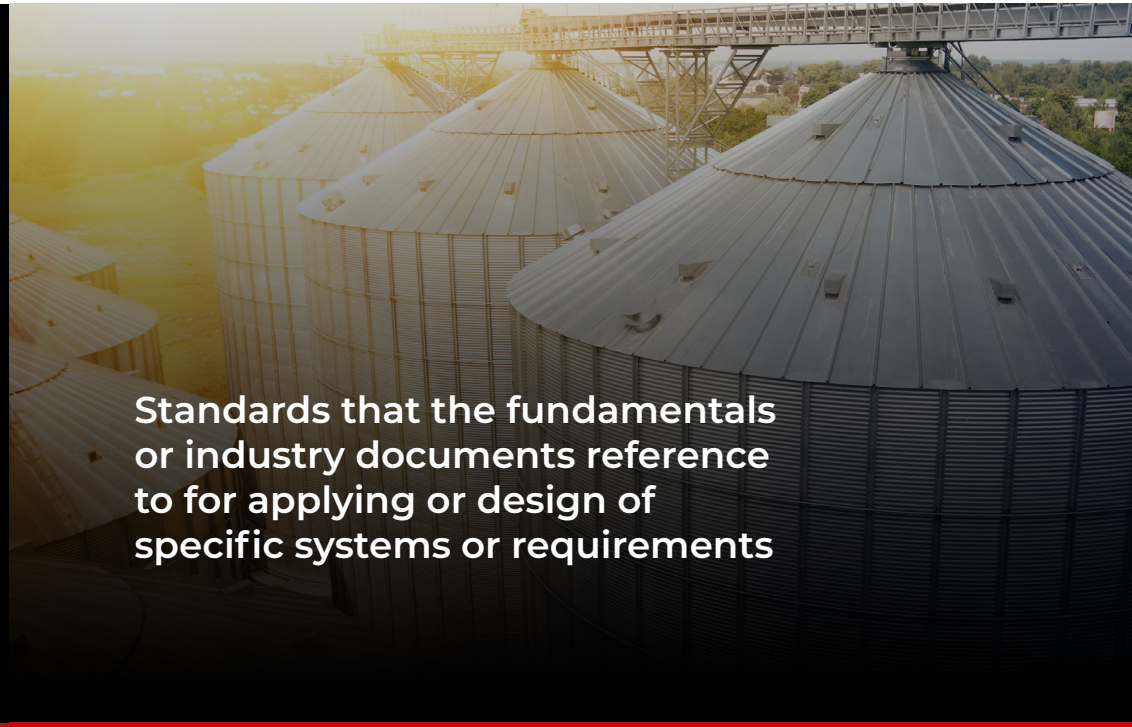


CURRENT NFPA DUST STANDARD STRUCTURE



- **Chapter 1** – Administration
- **Chapter 2** – Referenced Publications
- **Chapter 3** – Definitions
- **Chapter 4** – General Requirements
- **Chapter 5** – Hazard Identification
- **Chapter 6** – Performance-Based Design Option
- **Chapter 7** – Dust Hazard Analysis (DHA)
- **Chapter 8** – Management Systems
- **Chapter 9** – Hazard Management: Mitigation and Prevention
- **Annex X**

"HOW TO" STANDARDS

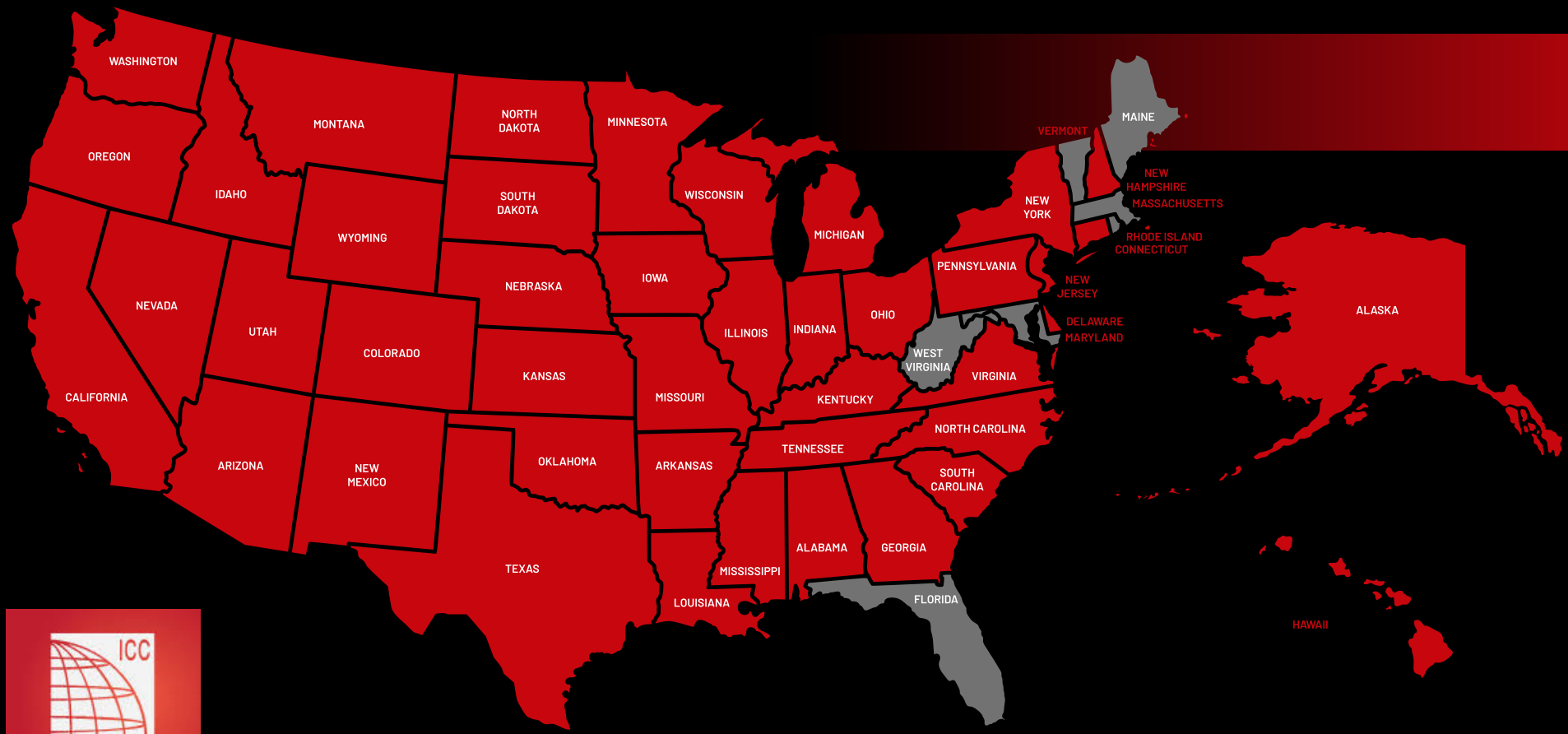


Standards that the fundamentals or industry documents reference to for applying or design of specific systems or requirements

NFPA 68
venting and flameless venting

NFPA 69
suppression, isolation, inerting, prevention

NFPA 70 & 499
electrical classification



ICC
INTERNATIONAL CODE COUNCIL®

INTERNATIONAL FIRE CODES

NFPA 652 now included in the IFC code as a Standard to comply with when equipment, processes, and operations involve dust explosion hazards.

Also reference to industry- or commodity-specific Standard

A code local jurisdictions use to determine building occupancy, new construction requirements, and safety

State or local

WHY CHANGE?

- **Conflicts and gaps still exist** between Standards
- **Improves accessibility** to combustible dust safety
- **Hard for companies** with multiple industry functions to comply
- **Standards on different revision** cycles depending on the industry
- **Combined standard** brings more expertise into safety, streamlines improvement
- **A clearer Standard = less combustible dust incidents**

EXAMPLES OF CONFLICTS OR GAPS

- Limited guidance on prescriptive requirements for different types of dryers
- Self heating and reactivity information on dusts
- Sections of processes that don't require a retroactive DHA based on industry
- Wood Bioenergy or Biomass processes not really considered in NFPA 664
- Lack of information for additive manufacturing (some for metals)
- Fire protection requirements and methods

NFPA 660

A special task group was formed amongst the dust committees

The decision to consolidate the standards into one has been moved forward by the Standards Council

The goal is to create a combined Standard or Code in the next 3 to 5 years

Extensive process involving multiple committees to make this happen

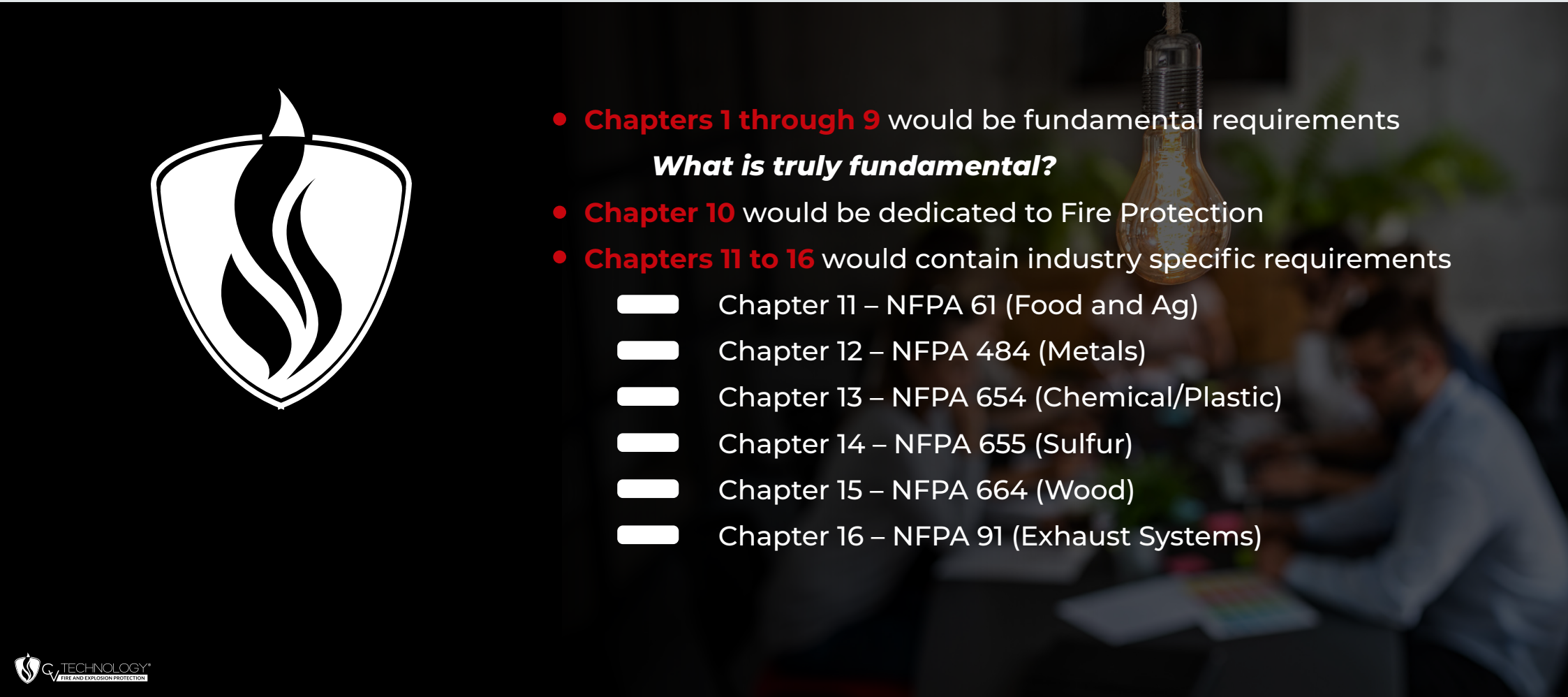
Proposed title and document number still in the works

NFPA 660 Combustible Dust Code

NFPA STANDARDS VS CODES

NFPA Standard	vs	NFPA Code
Tends to be a more detailed elaboration, like the nuts and bolts of meeting a code		A set of rules put together by knowledgeable people
Will spell out what kind of system and how it must work		Tends to spell out that you need a system and points you to where you find details on what kind
Tells you how to do it		Tells you what you need to do

PROPOSED STRUCTURE OF NFPA 660



- **Chapters 1 through 9** would be fundamental requirements

  What is truly fundamental?

- **Chapter 10** would be dedicated to Fire Protection
- **Chapters 11 to 16** would contain industry specific requirements
  - Chapter 11 – NFPA 61 (Food and Ag)
  - Chapter 12 – NFPA 484 (Metals)
  - Chapter 13 – NFPA 654 (Chemical/Plastic)
  - Chapter 14 – NFPA 655 (Sulfur)
  - Chapter 15 – NFPA 664 (Wood)
  - Chapter 16 – NFPA 91 (Exhaust Systems)

KNOWLEDGE OF EXISTING TECHNICAL COMMITTEES

Each existing technical committee will remain intact

Industry specific committee will be responsible for chapter associated with the respective industry

Fundamentals committee will be responsible for the front chapters with “common/ fundamental” sections

Correlating Committee will continue to review content

POSSIBLE SECTION CONFLICTS

Chapter 1 in the new Code will address conflicts

Structure is in place now with current separate documents

If conflict between fundamentals and industry	→	**you can choose**
If industry prohibits	→	**you follow industry**
If not addressed in industry	→	**you follow fundamental**

THE WORK BEGINS

Technical committees are providing input currently on which requirements should be “universal” or “fundamental”

The correlating committee will then combine that input into a draft of the fundamentals section

The other technical committee then review the respective industry- or commodity- specific chapter to see address any gaps in material or repetitive items

Correlating committee then forms the draft document

NFPA STANDARDS DEVELOPMENT PROCESS

ANTICIPATED TO **START IN 2022**

Process that begins after an initial draft standard is published and enters a formal revision cycle

01

Public Input Stage

Public input opens and closes, first draft meeting, and first draft report

02

Public Comment Stage

Public comment opens and closes on the first draft, second draft meeting, and a second draft

03

NFPA Technical Meeting

Notice of Intent to Make a Motion (NITMAM) reviewed and certified. Vote.

04

Issuance of the Standard

NFPA Standard Council meets to review any appeals, decision to issue the Code/Standard

ANTICIPATED TIMELINE

2021

INITIAL DRAFT RELEASED

Anticipated August 2021 timeline (subject to change)

2022

FORMAL STANDARDS PROCESS

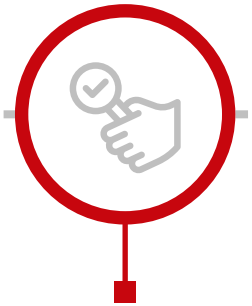
NFPA Standard development process, public input

2023

FINAL VERSION

Final version finalized and issued for release

2024



STANDARD EFFECTIVE

Approved and issued in 2024 and 7 original documents replaced

CURRENT STANDARDS WHAT HAPPENS?

Typical revision cycle is **every 3 year** for the dust Standards

Revision process has been **put on pause** for most existing Standards

Should remain in current form **until 660 arrival**

NFPA 484 was mid cycle so a 2021 release of a new version is likely

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For More Information and Future Updates

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