



## Comments to DOL

March 18, 1991

Docket Officer  
 Docket H-117  
 U.S. Department of Labor  
 Occupational Safety and Health  
 Administration  
 Room N2625  
 200 Constitution Avenue, N.W.  
 Washington, D.C. 20210

Dear Sir/Madam:

This letter is in response to the request for information announced in the Federal Register on December 10, 1990 [55 FR 50722], regarding the record for the grain handling facilities rulemaking promulgated by the Occupational Safety and Health Administration (OSHA).

This request for information relates to a court-ordered remand directing OSHA to consider applying the 1/8 of an inch action level for housekeeping to the entire facility. The present standard requires grain elevators to initiate appropriate cleaning measures whenever grain dust accumulations reach a depth of 1/8 inch in "priority housekeeping areas." These areas included floor areas that are within 35 feet of inside bucket elevators; floors of enclosed areas containing grinding equipment; and floors of enclosed areas containing grain dryers located inside the facility.

NIOSH submitted comments (March 1984) and presented testimony (June 1984) on the proposed rule. NIOSH would like to reconfirm its position regarding the action level of 1/64-inch of grain dust as specified in our previously submitted comments and testimony. It should be noted that NIOSH stated on page 47 of the publication, "Occupational safety in grain elevators and feed mills":

"Although the 1/8-inch limit, if maintained, would improve cleanliness levels in many facilities, it is considered excessive since dust accumulations as little as 1/64 inch could support secondary explosions if uniformly dispersed into the air."

As indicated in the NIOSH comments, the concept of a 1/64-inch level was recommended by the National Academy of Sciences in their publication, "Prevention of grain elevator and mill explosions: report of the Panel on Cause and Prevention of Grain Elevator Explosions of the Committee on Evaluation of Industrial Hazards."

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Through its research grant program, NIOSH has supported projects at the University of Michigan on dust explosions. The primary investigator for these projects is Dr. C.W. Kauffman, Aerospace Engineering Department. Enclosed for your consideration is a project report titled, "Explosion hazards related to grain and feed dusts" that is relevant to the issue being considered by OSHA. This report presents information on actual dust explosions in industrial situations and on experiments to study methods for preventing primary and secondary dust explosions. From the years 1984 to 1987, a total of 69 explosions in agricultural facilities resulted in 15 deaths and 57 injuries to workers. Research has indicated that the five components necessary to support a dust explosion were present in all 69 explosions, including fuel, oxidizer, ignition, mixing and confinement. In facilities where secondary explosions have occurred, the quality of housekeeping was poor. A variety of ignition sources were identified including welding, choked bucket elevators, electrical equipment and appliances, and bearings.

A second paper titled, "Research on dust explosions at the University of Michigan" is also enclosed for your information. This paper summarizes research that has been performed and is currently in progress on many aspects of dust explosions, including dust ignition, smoldering combustion, turbulent combustion, layered dust combustion, and detonations.

NIOSH suggests that OSHA contact Dr. C.W. Kauffman (Department of Aerospace Engineering, University of Michigan, 2508 Patterson Place, Ann Arbor, Michigan 48109-2140, phone 313/936-0104) for additional information on this subject. Dr. Kauffman has worked for a number of years on NIOSH grants and is an internationally-recognized expert in the field of dust explosions.

If you have any questions, please call me.

Sincerely yours,

Richard W. Niemeier, Ph.D.  
Director  
Division of Standards Development  
and Technology Transfer

2 Enclosures

cc:

A. Amendola/D. Smith  
R. Fleming  
C.W. Kauffman

NIOSH/DSDTT:DJohnson:dm:TaftSB-52:Cinti:OH:3/18/91

**Enclosures and/or attachments that  
are not included are available free of  
charge from the NIOSH Docket  
Office (513/533-8450).**