



Cooperative Extension Service

Extension Grain Science and Industry
Shellenberger Hall
Manhattan, Kansas 66506-2201
913-532-6161
FAX: 913-532-7010

January 8, 1993

Grain Dust Explosions - Record Low in 1992*

A record low, six grain dust explosions were reported in the U.S. for 1992 according to data compiled by Ralph Regan, FGIS Safety Director, and Robert W. Schoeff, Consultant and Professor Emeritus, Kansas State University. This compares to 12 in 1991 and a ten-year average of 15 explosions.

There was one fatality and eight injured.

Five of the six incidents occurred in grain elevators and the other in a toy manufacturing plant.

The primary explosion occurred in the elevator leg in four out of six cases.

The **probable cause** was identified in only two cases, lightning and a hot pulley shaft.

Fuel sources were identified as corn (4), cornstarch, and wheat.

The grain dust explosions occurred in Iowa (2), Illinois, Rhode Island, South Dakota, and Texas.

Estimated property damage amounted to \$415,000.00.

Appreciation is expressed to the many persons who provided the information that allows us to build a data base on grain dust explosions that does not exist in any other industry in the U.S.

Robert W. Schoeff
Dept. of Grain Science & Industry
Kansas State University
Manhattan, KS 66506-2201
January 8, 1993

*This report subject to revisions as additional information is received.

REPORTED GRAIN DUST EXPLOSIONS IN U.S. - 1992**

<u>NO.</u>	<u>DATE</u>	<u>COMPANY AND ADDRESS</u>	<u>FACILITY</u>	<u>DAMAGE*</u>	<u>KILLED</u>	<u>INJURED</u>
1	June 3	Hasbro Inc. Center Falls, RI	Toy Manufacturer	Minor	0	2
2	June 9	Farmers Co-op Prairie City, IA	Grain Elevator	Minor	0	0
3	Aug. 7	Austwell Farmers Co-op Austwell, TX	Grain Elevator	Moderate	0	1
4	Aug. 10	Agri-Industries McGregor, IA	Grain Elevator	Moderate	0	3
5	Aug. 25	Consolidated Grain & Barge Mound City, IL	Grain Elevator	Moderate	0	0
6	Aug. 28	Lake Preston Co-op Lake Preston, SD	Grain Elevator	Minor	1	2
TOTALS					1	8

*Minor - Less than \$50,000
 Moderate - 50,000 to \$500,000
 Severe - Over \$500,000

Robert W. Schoeff
 Kansas State University
 Manhattan, KS 66506-2201
 January 8, 1993
 in cooperation with
 Ralph Regan, FGIS,
 USDA, Washington, DC

** This report is subject to revision as new information is received.

U.S. GRAIN DUST EXPLOSION STATISTICS*

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>TEN YEAR TOTAL</u>
Number	13	21	23	23	16	12	13	15	12	6	154
Dead	0	9	4	2	0	8	2	0	1	1	27
Injured	14	30	20	14	18	10	7	7	4	8	132
Est. Damage to Facility (\$ Mil.)	3.6	19.9	65.0	1.6	8.3	8.7	3.9	5.0	.3	.4	116.7
Type of Facility:											
Grain Elevator	9	12	19	13	11	7	7	8	4	5	95
Feed Mill	4	5	1	5	4	1	1	1	4	0	26
Flour Mill	0	1	0	1	0	0	0	2	1	0	5
Other:											
Corn Milling, Dry	0	1	2	0	0	2	1	1	0	0	7
Corn Milling, Wet	0	0	0	0	0	0	2	1	0	0	3
Soybean	0	1	0	0	0	0	0	0	0	0	1
Rice Mill	0	0	1	2	0	1	0	1	1	0	6
Oat Mill	0	0	0	0	0	1	0	0	0	0	1
Other	0	1	0	4	1	0	2	1	2	1	10

*Source: Robert W. Schoeff, Kansas State University, in cooperation with Ralph Regan, FGIS-USDA, January 1993

U.S.

GRAIN DUST EXPLOSIONS

LEADING STATES - 1958 to Date

<u>STATE</u>	<u>1958-1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>TEN-YEAR TOTAL</u>
Nebraska	45	1	6	4	2	0	0	1	0	1	0	15
Iowa	41	0	0	2	2	2	1	3	0	4	2	16
Illinois	37	2	2	4	1	2	1	2	2	0	1	17
Texas	30	3	1	1	2	1	1	0	1	0	1	11
Minnesota	26	2	1	2	1	1	3	1	2	0	0	13
Kansas	21	0	0	1	5	0	0	3	3	1	0	13
Missouri	23	0	0	1	2	0	0	1	0	0	0	4
Ohio	15	0	0	2	0	2	0	0	1	1	0	6
Oklahoma	15	0	0	0	0	0	1	0	0	0	0	1
New York	9	0	0	0	0	0	0	0	0	0	0	0
Wisconsin	9	0	0	0	0	0	0	0	0	0	0	0

Source: Robert W. Schoeff, Kansas State University, Manhattan, KS 66506-2201, January 1993

GRAIN DUST EXPLOSIONS
BY COMMODITY HANDLED AT TIME OF EXPLOSION

1983 to Date

<u>COMMODITY</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>TEN YEAR TOTAL</u>
Corn	8	11	14	6	13	7	4	2	5	4	74
Sorghum	2	0	2	6	0	0	2	1	0	0	13
Soybeans	1	2	0	1	1	1	1	1	0	0	8
Wheat	0	5	0	2	0	1	0	1	1	1	11
Barley	0	0	1	1	0	0	0	1	1	0	4
Oats	0	1	0	0	0	1	1	0	1	0	3
Barley Chaff/ Malt Sprouts	0	0	0	0	0	0	0	0	0	0	0
Beet Pulp	0	0	0	0	0	0	1	0	0	0	1
Corn Starch	0	0	1	0	0	0	1	0	0	1	3
Corn Gluten Meal	0	1	2	0	0	1	1	0	0	0	5
Distillers Feed	0	0	0	0	0	0	0	1	0	0	1
Feed By-Products	0	0	0	0	0	0	1	1	0	0	2
Grain Screenings	1	0	0	0	1	0	0	1	0	0	3
Mixed Feed	0	0	0	0	1	0	0	0	0	0	1
Rice (Bran) (Flour)	0	0	1	2	0	1	0	1	0	0	5
Wheat Flour	0	0	0	0	0	0	0	1	0	0	1
Wheat (Starch) (Gluten)	0	0	0	0	0	0	1	0	0	0	1
Other	1	2	2	5	0	0	0	4	4	0	18
TOTAL EXPLOSIONS	13	21	23	23	16	12	13	15	12	6	155

Source: Robert W. Schoeff, Kansas State University, Manhattan, KS 66506-2201, January 1993

GRAIN DUST EXPLOSIONS BY INDUSTRIES

