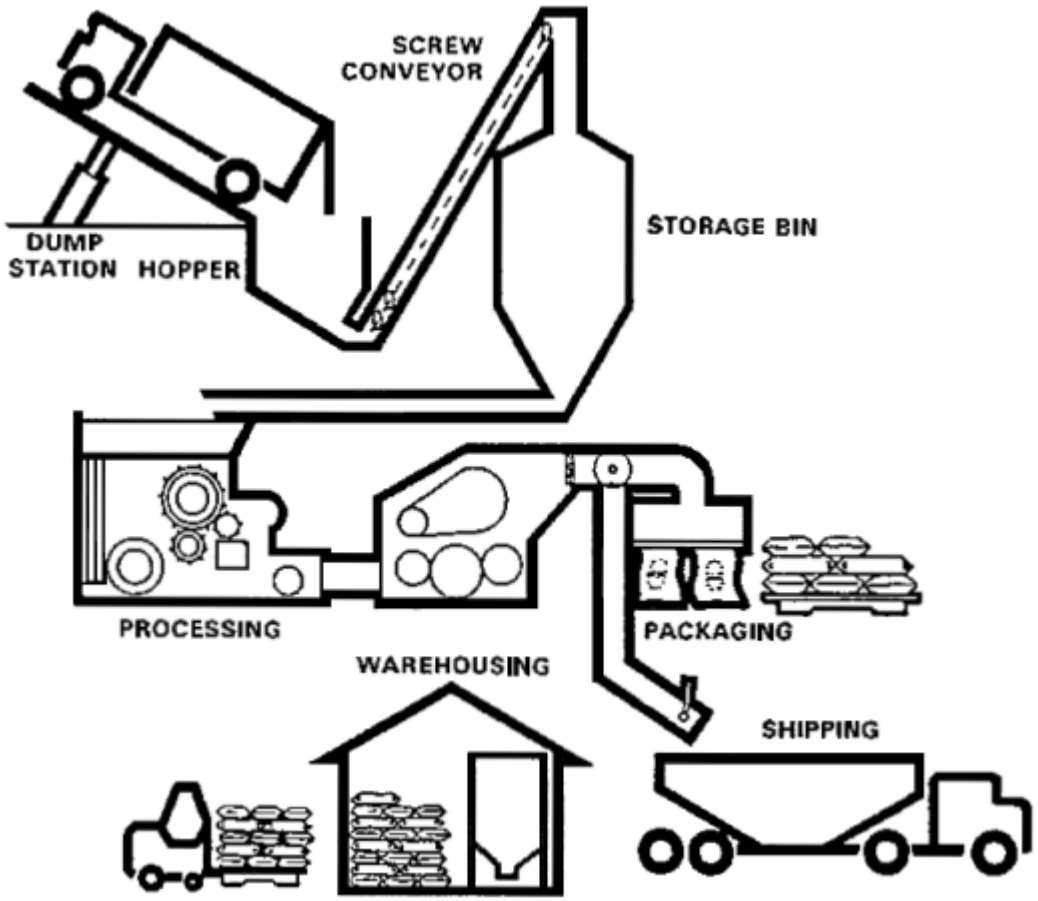
	NORTH CAROLINA DEPARTMENT OF LABOR	**No. 20-1**
	OSH DIVISION	**Date: 10/2009**
	OSHNC INDUSTRIAL DATA REPORT	**Pages: 3**

Industry: **Food and Kindred Products**	Sub-Group: **Grain Mill Products**
SIC: **2041, 2042, 2043, 2044, 2045 and 2046**	NAICS: **311211, 311212, 311221, 311222, 311230 and 311822**

PROCESS DESCRIPTION: Grains are normally received by truck or rail in bulk form and unloaded by dumping into hoppers. The grain passes from the hoppers by belt or screw conveyors to bucket or pneumatic elevators. It is lifted and delivered to horizontal conveyors and carried to individual storage silos. Withdraw from silos is by gravity from the bottom. The grain is then transferred by conveyor or elevator to storage bins or hoppers above milling or processing equipment. Cleaners, scourers or scalpers are provided at this point to remove foreign material from the product. Most systems are designed to allow the product to bypass the silo and thus provide direct transfer by gravity flow from the elevator through the typical products being ground meal, flake or flour. Further processing may include mixing and blending with animal by-products and vitamins, and manufacture of pellets and cooking. After processing, the product is carried by conveyor to storage silos, bagging operations or loaded directly onto bulk trucks. Packaged products are often warehoused.

PROCESS FLOW:



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Hazards Analysis

Major Hazards			Other Hazards		
Location	**Item**	**Hazard**	**Location**	**Item**	**Hazard**
Receiving	Hoppers	Floor holes and openings	Warehouse	Feed bags	Strains from lifting; insecure storage
	Housekeeping	Slips, trips and falls			
	Screw conveyors	Nip points			
	Rail cars, trailers	Rolling or moving vehicles; unprotected platforms at loading stations			
Throughout	Combustible dust	Flash fire and dust explosion from ignition by electrical and other sources	Processing	Mechanical power transmission apparatus	Amputations and crushed limbs from contact with gears, shafts, pulleys, belts, chains and sprockets
Shipping	Material handling	Unsafe operation of lift trucks, traffic, unqualified operators and improper dock plates; carbon monoxide exposure	Throughout	Housekeeping	Slips, trips and falls from grain spillage; fire
				Dust	Respiratory problems
Storage	Silos, bins, hoppers	Oxygen deficient atmospheres, combustible dust and long, high ladders	Bag filling	Filler	Inhalation of dusts and falls
			Plant	Manlifts	Falls
				Noise	Hearing loss

Key OSHNC Standards

Reference	29 CFR 1910 - General Industry Standards
NCGS 95-129	General duty clause – ergonomics

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Subpart D	Walking and working surfaces
Subpart E	Exit Routes, Emergency Action Plans, and Fire Prevention Plans
Subpart I	Personal protective equipment
Subpart O	Machinery and machine guarding
Subpart S	Electrical
1910.68	Manlifts
1910.95	Occupational noise exposure
1910.146	Permit-required confined space entry - where .272 does not apply
1910.147	Control of hazardous energy (lockout/tagout) – where .272 does not apply
1910.176	Material handling
1910.178	Powered industrial trucks
1910.272	Grain handling facilities
1910.1000	Air contaminants
1910.1026	Hexavalent chromium
1910.1200	Hazard communication

Inspection Analysis

In many cases it will be difficult to follow the process flow, but it is important to do so when possible. Often shipping and receiving areas are combined. The receiving hopper holes are commonly at floor level and produce tripping hazards if not properly screened or covered. Material handling equipment and material stacking should be checked in the shipping, receiving and warehouse areas. Grain storage areas must be checked for proper ladder safety devices, and employees must be aware of proper procedures when entering potentially oxygen-deficient atmospheres that may exist inside silos. Floor holes and openings are common in this area. Mechanical power transmission apparatus will be found throughout in abundance, primarily belt drives and gears. Sifters and separators are often provided with revolving counterweights.

Classification of Division I and II hazardous locations and the evaluation of ignition safeguards is of prime importance in an effective safety inspection. The inspector must be thoroughly familiar with the requirements of Subpart S before beginning any inspection in areas likely to contain combustible dusts. Close observation must be made of all permanent electrical fixtures and flame or spark producing devices for proper type, installation and maintenance. Special attention must be devoted to lift truck equipment traveling through classified locations should be approved for that location. A very important factor in designation and evaluation of the hazard is housekeeping. The inspector must observe and document (in addition to suspended particles, dust clouds) deposits of combustible dust on ledges, floors and on or with often it is or to eliminate deposits of combustible dusts.

Manlifts must be carefully inspected for required safety features.

Other Pertinent Comments: Flashbulbs and other unapproved electrical equipment shall not be used in atmospheres containing combustible material in suspension.