U.S. Department of Labor

Mine Safety and Health Administration

NATIONAL STONE, SAND & GRAVEL ASSOCIATION



Natural building blocks for quality of life

MSHA / NSSGA ALLIANCE

Formed Feb. 11, 2003

MSHA/NSSGA Alliance – Injury and Illness Data Analysis Team Meeting Statement of Work

MISSION:

- Examine MSHA's injury and illness database for the aggregate industry to identify what interventions will improve miner health and safety

SCOPE (CY 2000-2002):

- 1) Identify where the most injuries or illnesses occurred by accident classification and type of activity
- 2) Examine the most severe injuries and illnesses in these classifications

A total of 12,147 injuries, including 67 fatalities and 129 permanent total or partial disabilities, were analyzed in 12 aggregate industry classifications, including crushed stone, sand and gravel, and shale.

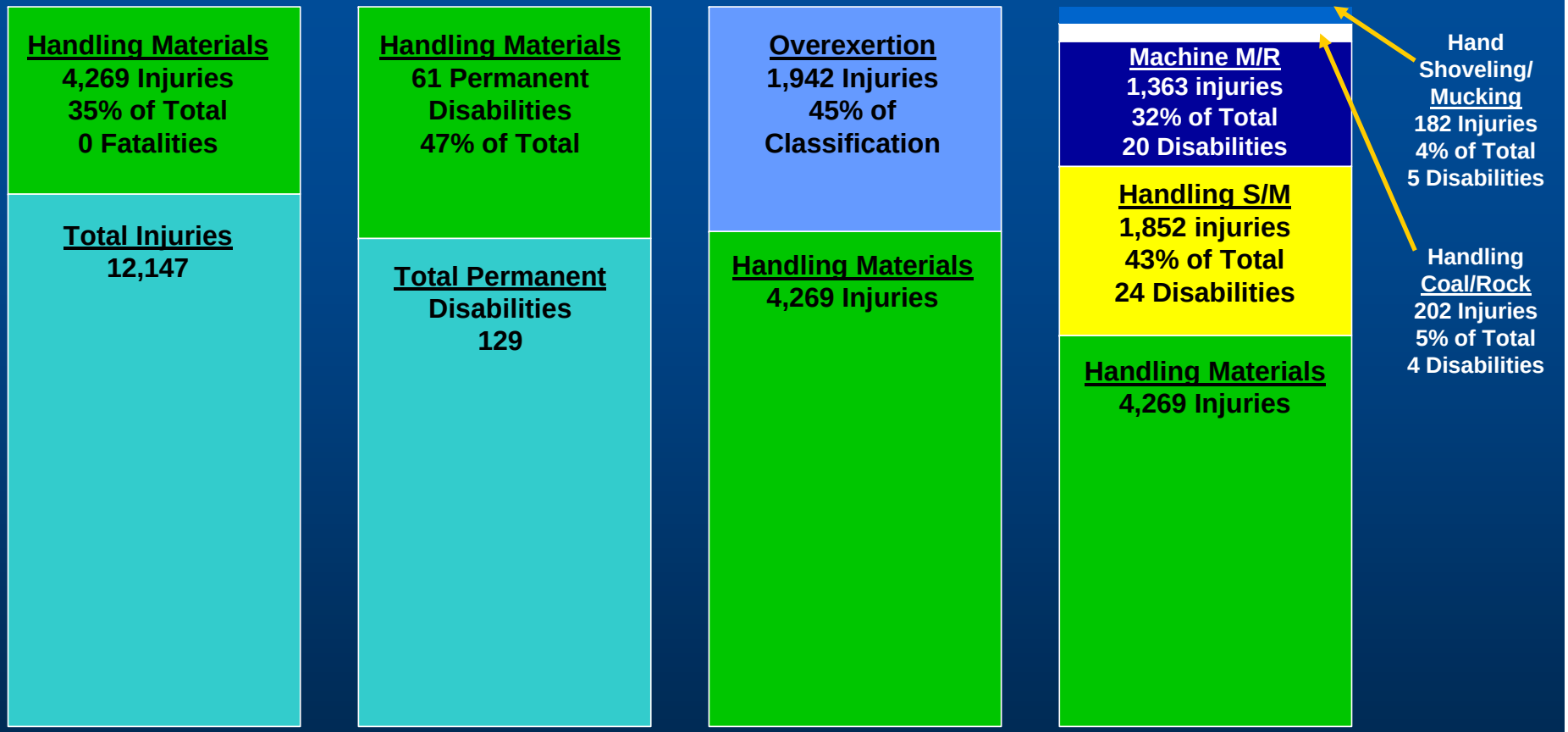
CODE DEFINITIONS

- Accident classification – circumstances that contributed most directly to accident; e.g., handling material or slip/fall of person
- Accident type – event which directly resulted in the injury; e.g., overexertion
- Activity – what the injured was doing at the time of the injury; e.g., machine maintenance/repair

TWO OF THE 21 ACCIDENT CLASSIFICATIONS ACCOUNTED FOR 57% OF THE ACCIDENTS (n = 7,337)

- Handling Material
- Slip/Fall of Person

Handling Materials Classification



- Total for All Categories
- Handling Supplies/Materials Subcategory
- Machine M/R Subcategory
- Hand Shoveling/Mucking Subcategory
- Handling Materials Classification
- Overexertion Subcategory
- Handling Coal/Rock Waste/Ore Subcategory

Handling Materials

- 4,269 injuries (35%)
- 0 fatalities
- 61 permanent disabilities (47%)

OVEREXERTION
1,942 (45%)

HANDLING MATERIALS (n = 4,269)

Activities resulting in the most injuries:

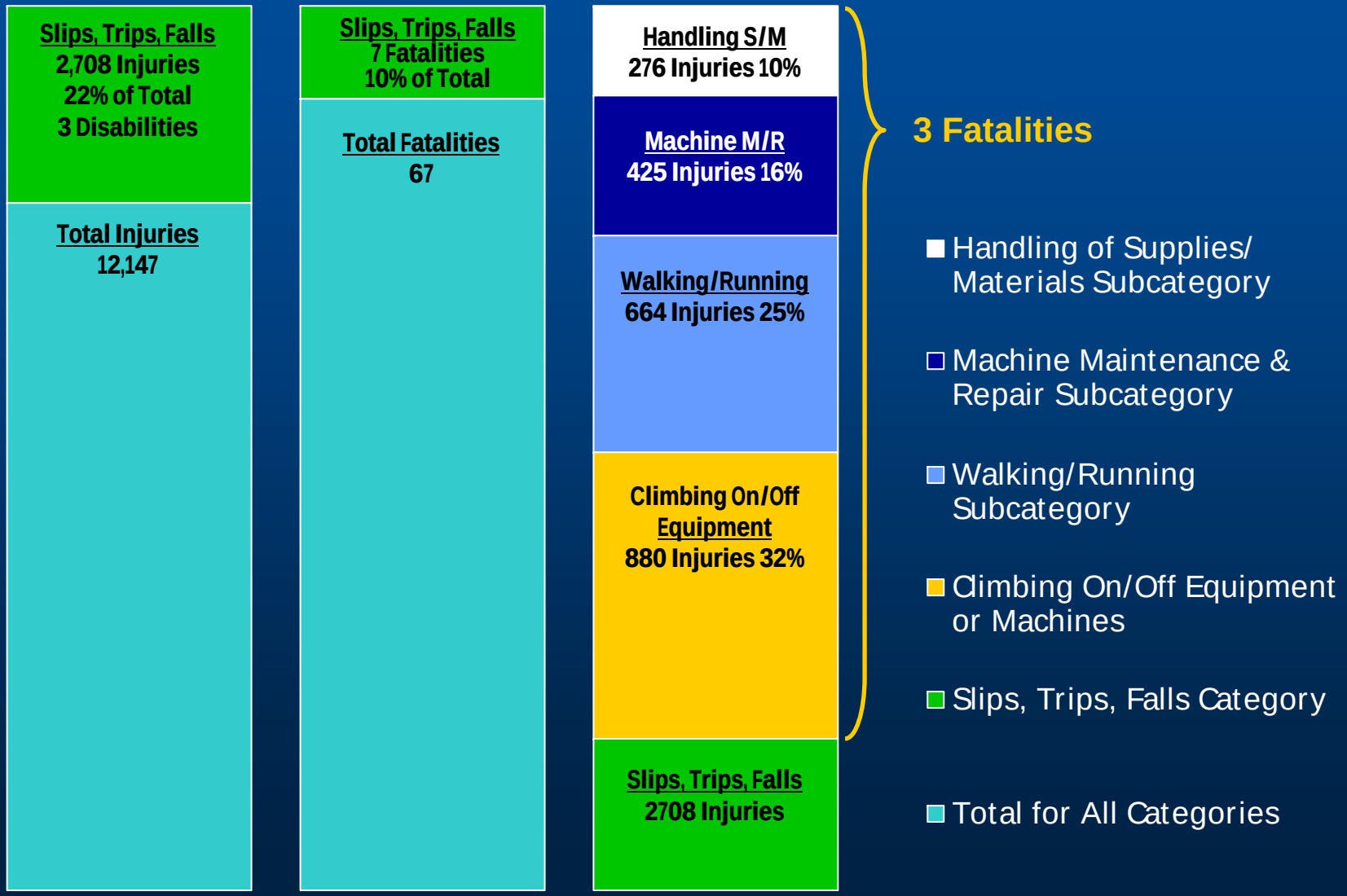
- Handling supplies/materials

  1,852 injuries (43%, 24 permanent disabilities)

- Machine maintenance & repair

  1,363 injuries (32%, 20 permanent disabilities)

Slips, Trips, and Falls Classification



SLIPS, TRIPS, AND FALLS (n = 2,708)

Activities resulting in most injuries:

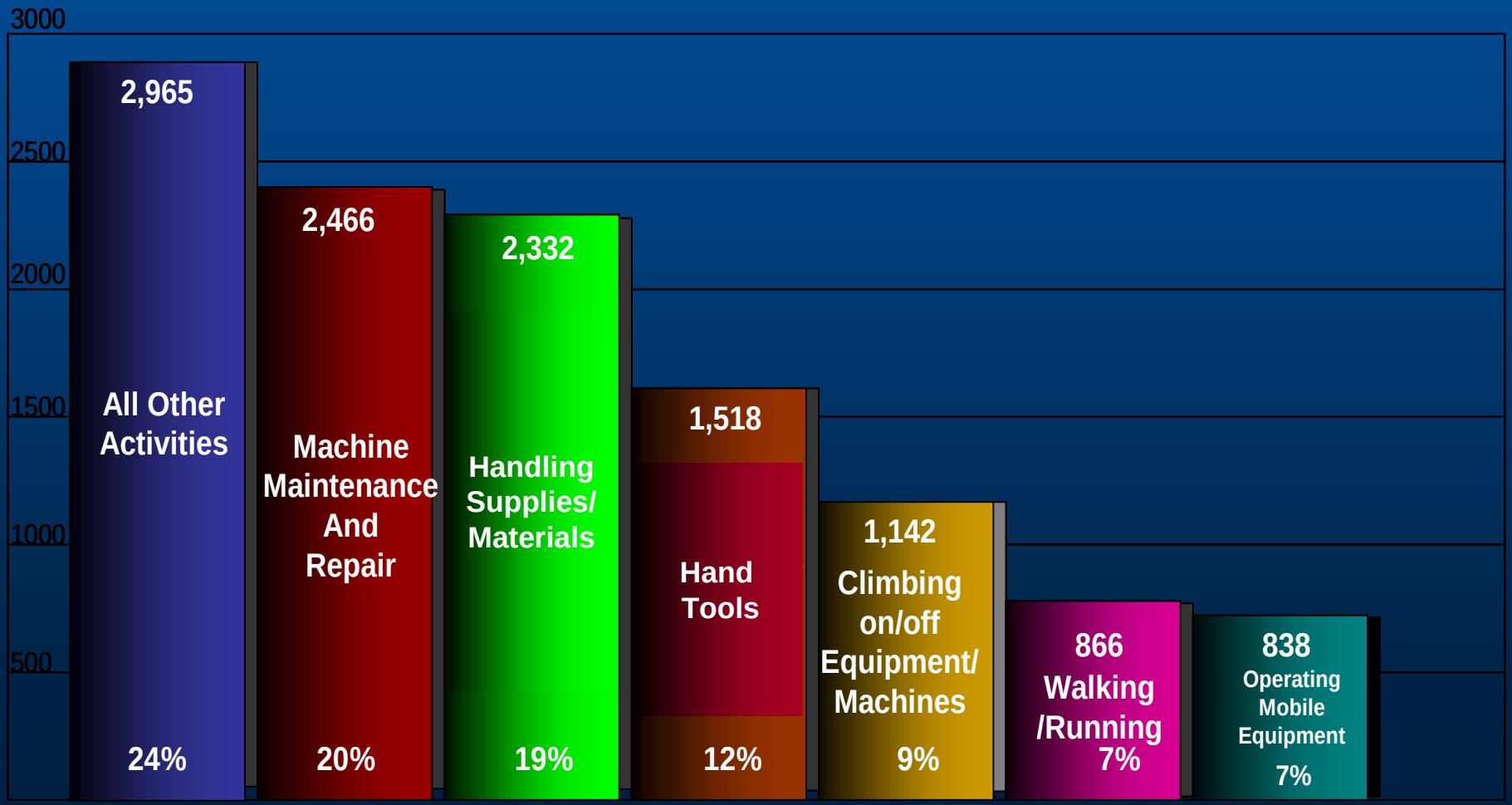
- **Climbing on / off equipment or machines**
  - 880 injuries (32%)
- **Walking / running**
  - 664 injuries (25%)
- **Machine maintenance / repair**
  - 425 injuries (16%)
- **Handling supplies / materials**
  - 276 injuries (10%)

These activities accounted for 3 fatalities.

Six activities accounted for the most (76%) injuries:

- Machine Maintenance/Repair (20%)
- Handling Supplies/Materials (19%)
- Hand Tools (Not Powered) (12%)
- Climbing On/Off Equipment/Machines (9%)
- Walking/Running (7%)
- Operating Mobile Equipment (7%)

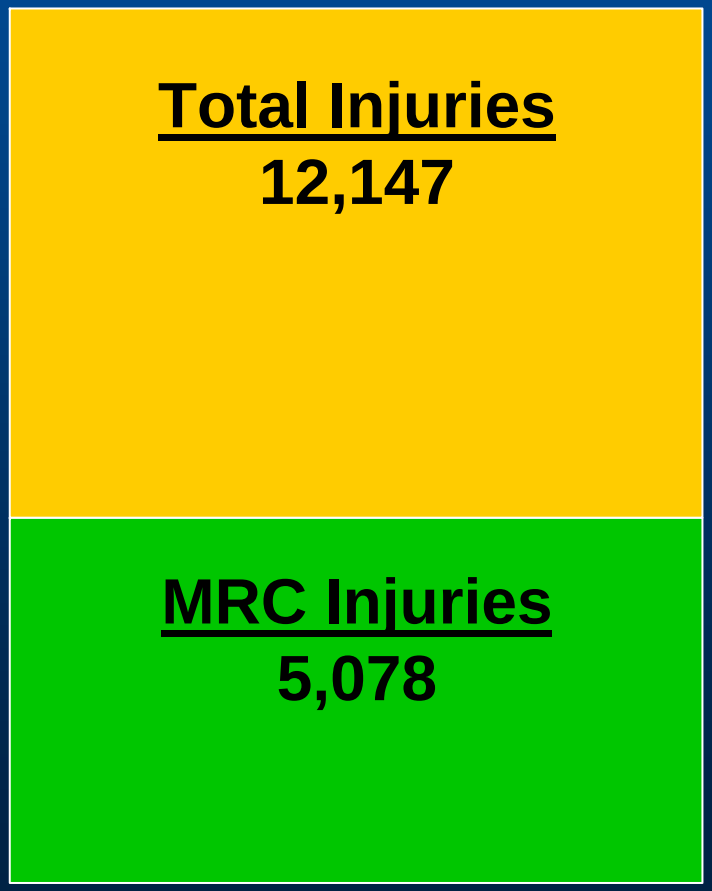
Total Injuries for CY 2000-2002
12,147



Combined Machine Maintenance/Repair with 10 Additional Activities

- “Maintenance, Repair and Construction.”
- 5,078 injuries within this expanded category (42% of the total injuries reviewed), which consists of:
  - Machine Maintenance/Repair
  - Hand Tools (not powered)
  - Surface Construction NEC
  - Welding and Cutting Elect/Acetyl
  - Hand Tools (powered)
  - Moving Equipment (Fans/Pumps/etc.)
  - Grinding Bits/Steel/Welds
  - Electrical Maintenance/Repair
  - Operate Hoist
  - Working with Chemicals
  - Working with Noxious Materials

Maintenance, Repair, & Construction Classification



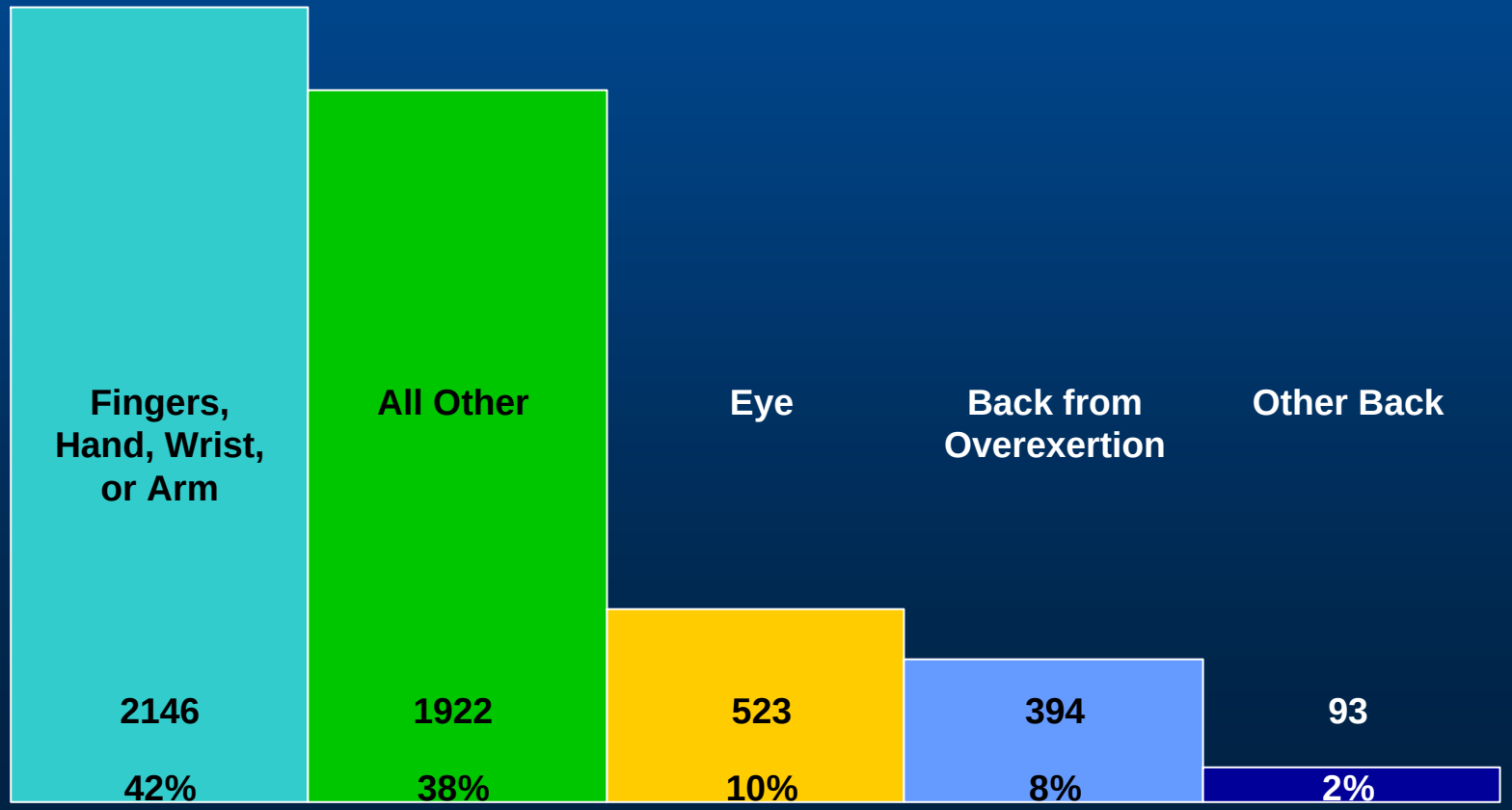
- Total Injuries
- Maintenance, Repair, & Construction Injuries

Maintenance, Repair and Construction (5,078 injuries)

- 2,146 arm and/or hand
- 523 eye
- 487 back
  - 394 overexertion

Maintenance, Repair, & Construction Injuries - Breakdown

5,078 Injuries



Maintenance, Repair and Construction

Analyzed by Accident Type and Classification

Struck-by NEC

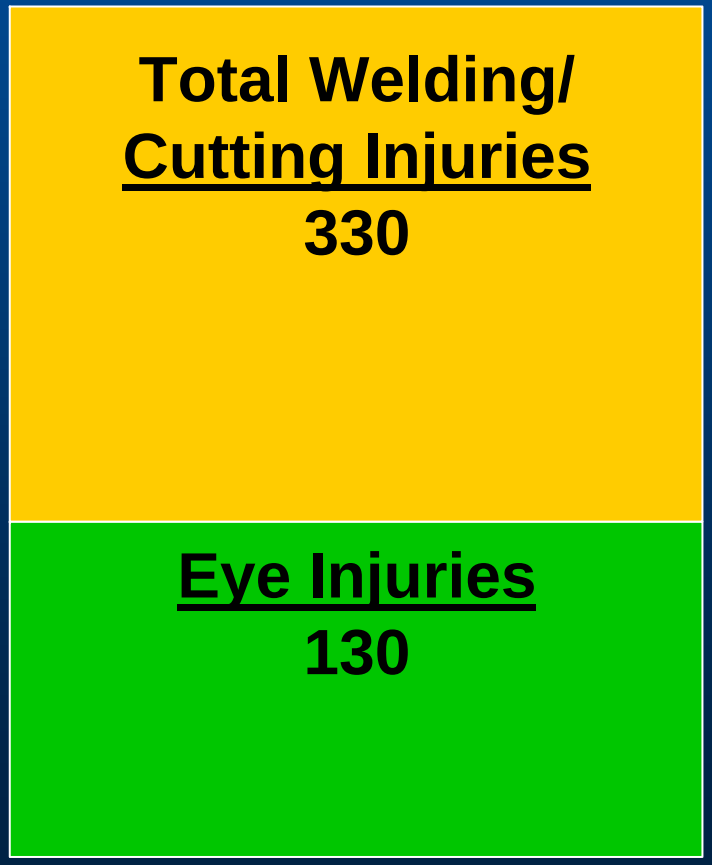
- 1,443 accidents (28%)
  - Hand Tools were majority
    - Knives, wrenches, hammers, axes, crowbars
      - Severity was low

35 permanently disabling injuries:

- 30 amputations
- Most involved fingers
- Lock out / Tag out issues
- Struck-by events

- Welding/Cutting (n = 330)
  - 130 eye
- Factors:
  - Improper PPE
  - Lack of use of PPE
  - Inadequate protection for bystander employees

Welding/Cutting Eye Injuries



- Total Welding/Cutting Injuries
- Total Eye Injuries from Welding/Cutting

POWERED HAND TOOLS (n = 329)

- 127 eye injuries
- 90 hand, fingers
- 0 fatalities
- 4 permanent disabilities
- 135 restricted duty or days lost

Grinders – 151 accidents

95 eye

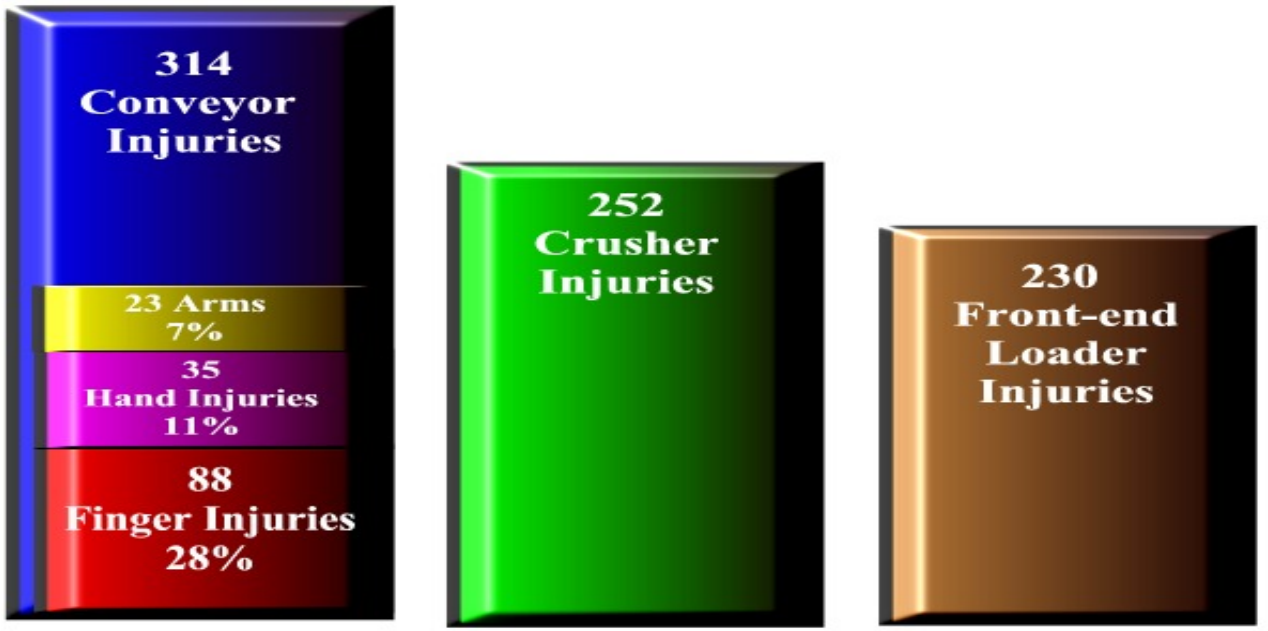
Powered Hand Tool Injuries

MRC ACCIDENTS BY TYPE OF EQUIPMENT

- Conveyors (314)
  - 88 finger
  - 35 hand
  - 23 arm
- Crushers (252)
- Front-end loaders (230)

Injuries by Equipment

12,147 Total Injuries



Conveyor Injuries

Crusher Injuries

Finger Injuries from Conveyors

Front-end Loader Injuries

Hand Injuries from Conveyors

Arm Injuries from Conveyors

High Frequency, Low Severity Injuries

Usually involve:

- eye (foreign object penetration)
- fingers (cuts)
- hand/arms (cuts)

A reduction will have a significant impact on the total incidence rate.

Recommendations

Analyze *all* maintenance jobs for potential hazards, then identify and implement best safety practices.

Recommendations

Place greater emphasis on prevention

- Dramatic improvements can be made in injury prevention by paying more attention to proper and safe use of hand tools (knives, hammers and wrenches)
- And proper, consistent use of PPE (gloves, safety glasses, etc.)

Recommendations

Start Each Day with a Safety Meeting

Benefits of Starting Each Day with a SAFE PRODUCTION MEETING

- Focuses attention
- Promotes communication
- Enhances collective thinking
- Determines readiness

Further Research

- Analyze the data for injuries involving the operation of mobile equipment

  To identify trends re: operator experience, training, equipment age and condition, types of accidents and specific operator tasks involved.

Further Research

- Analyze more thoroughly other activities that contribute significantly to injuries to identify trends and develop intervention strategies:
  - handling supplies and materials
  - climbing on and off equipment/machines
  - walking and running

Further Research

- Analyze MSHA's violation history data to
  - identify trends and areas where improvement is needed, and
  - determine if existing enforcement efforts are properly focused

Further Research

- Establish teams to analyze jobs most linked to accidents to
  - identify the knowledge, skills, information, procedures and tools needed to perform them correctly, and
  - design effective training programs and intervention strategies

Further Research

- Identify trends in types of accidents involving conveyors, crushers and front-end loaders, specific work activities being performed on this equipment, and occupation and experience of the injured employees
- Analyze occupational illness data for trends and prevention strategies

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