Section 2
Crane Types & Classification

Training Objective

At the completion of this section, students should have a thorough understanding of:

- various crane and hoist configurations and
- regulations and standards applicable to each.

OSHA/ASME defines crane as..

What is a crane?

…a machine for lifting and lowering a load and moving it horizontally. Cranes, whether fixed or mobile, are driven manually, by power or by a combination of both.

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Crane Types

Identify your crane…There are many types

Here are just a few

- Double Girder Top Running
- Gantry
- Power Mast
- Wall
- Stacker
- Overhead Hoists Underhung
- Jib
- Monorails
- Top Running Bridge Underhung Trolley
- Lever Hoists
- Below the Hook Lifting Devices

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Double Girder Top Running Crane

- **OSHA 1910.179**
- **ASME / ANSI B30.2**
- **CMAA SPECIFICATION #70**

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Gantry & Semi Gantry Cranes

Gantry Crane

Semi Gantry Crane
Single Leg Gantry Crane

- OSHA 1910.179
- ASME / ANSI B30.2
- CMAA SPECIFICATION #70

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Cantilever Gantry Crane

- OSHA 1910.179
- ASME / ANSI B30.2
- CMAA SPECIFICATION #70

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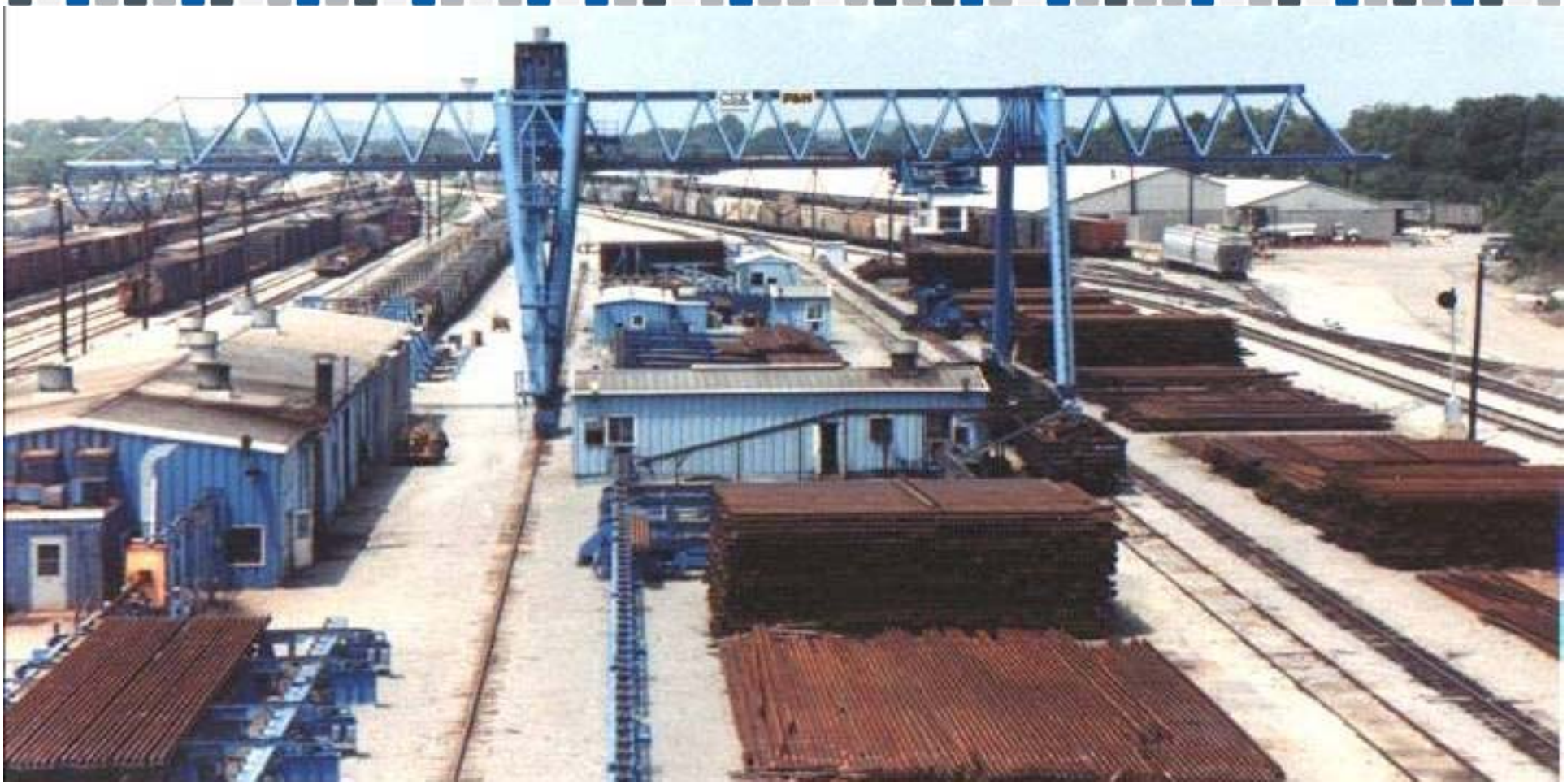
Cantilever Gantry Crane



- **OSHA 1910.179**
- **ASME / ANSI B30.2**
- **CMAA SPECIFICATION #70**

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Power Mast Crane

- **OSHA 1910.179**
- **ASME / ANSI B30.2**
- **CMAA SPEC #70**

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Wall Cranes

- **OSHA 1910.179**
- **ASME / ANSI B30.2**
- **ASME/ANSI B30.16**

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Isle Stacker Crane

CFR 29, USC 654, Section 5(a)(1)

ASME / ANSI B30.18

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Monorails & Underhung Cranes

- ASME / ANSI B30.11/B30.17
- CFR 29, USC 654, Section 5(a)(1)

This <u>is</u> a crane

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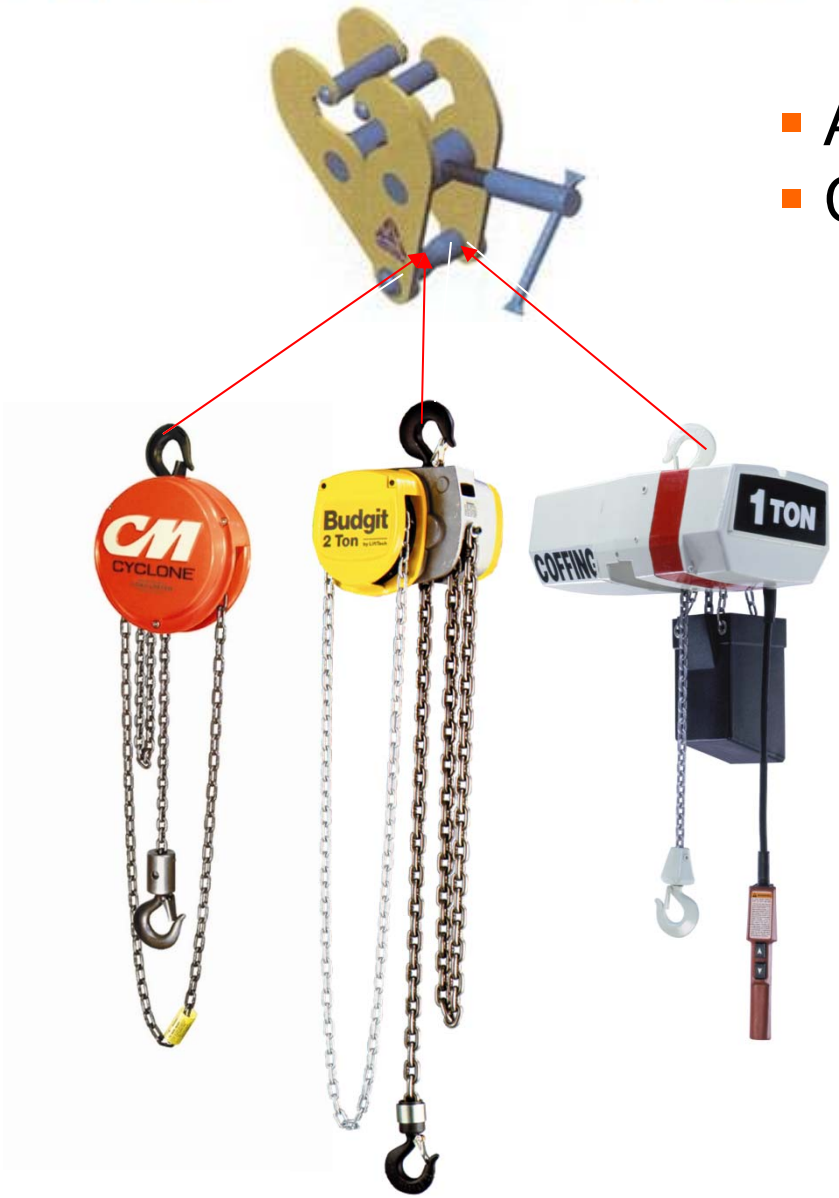
Overhead Hoists & Underhung Cranes



- ASME / ANSI B30.16
- CFR 29, USC 654, Section 5(a)(1)

This is <u>not</u> a crane

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Jib Crane/Monorail

- ASME / ANSI B30.11/B30.17
- CFR 29, USC 654, Section 5(a)(1)

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Underhung Cranes

- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.11/B30.17
- ASME / ANSI B30.16

Monorail

- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.11/B30.17
- ASME / ANSI B30.16
- CMAA SPECIFICATION #74

(Top and under running single girder EOTC utilizing under running trolley hoist)

ASME B30.11/30.17 will reference B30.16 on all matters pertaining to the hoist unit.

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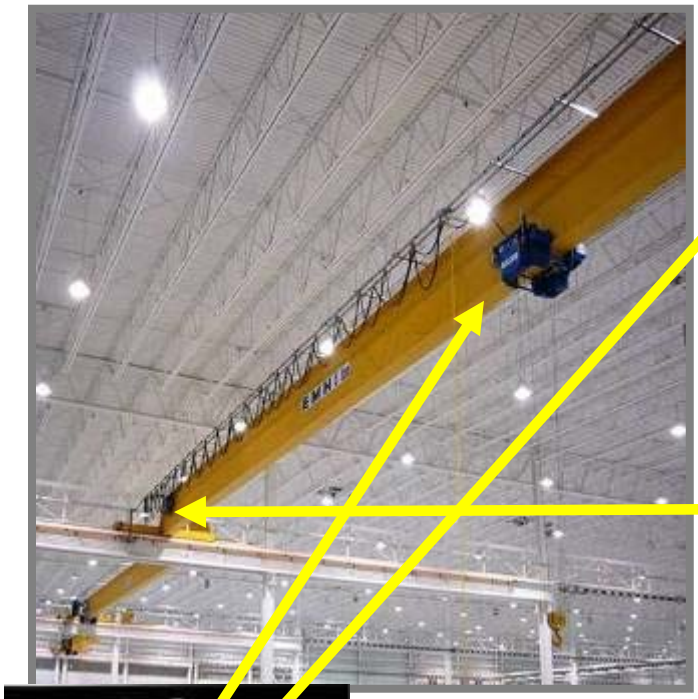
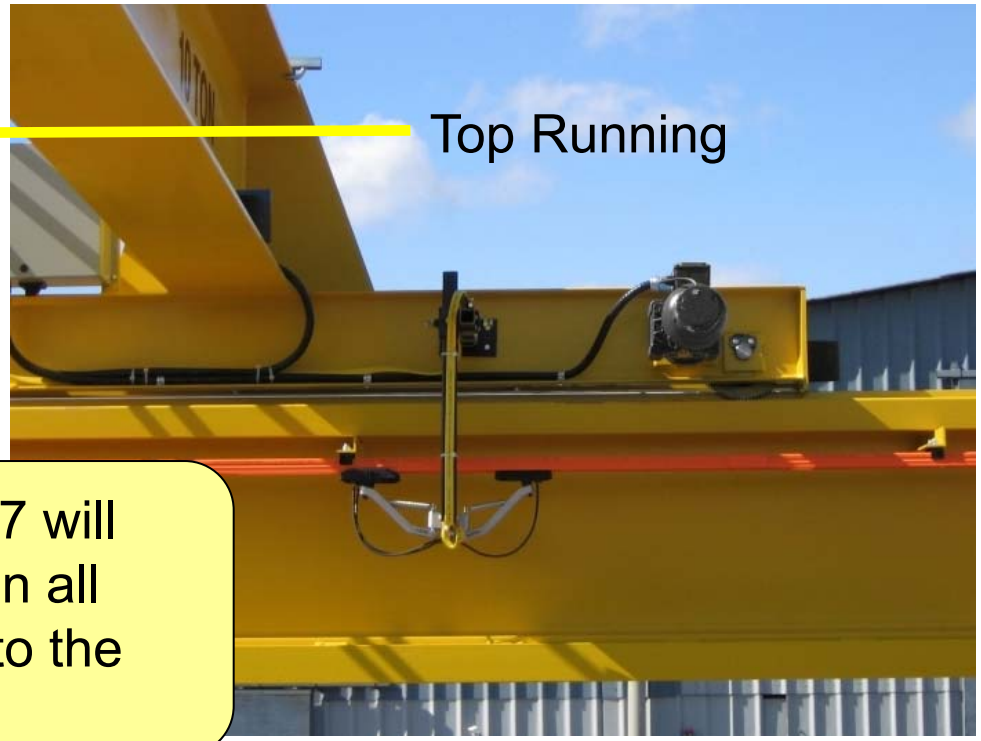
Top Running Single Girder



- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.17/30.11
- ASME / ANSI B30.16
- CMAA SPECIFICATION #74



ASME B30.11/30.17 will reference B30.16 on all matters pertaining to the hoist unit.

Under Running Cranes

- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.11/B30.17
- ASME B30.16
- CMAA SPECIFICATION #74

ASME B30.11/B30.17 will reference B30.16 on all matters pertaining to the hoist unit.

Lever Hoists

- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.21

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Below the Hook Lifting Devices

- CFR 29, USC 654, Section 5(a)(1)
- ASME / ANSI B30.20

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Crane Classifications

Crane Manufacturers Association of America Specification #74

Hoist Duty Class	Service Classification	Typical Areas of Application
H1	**Infrequent or Standby Service**	Powerhouses and utilities Infrequent handling Hoists are used primarily to install and service heavy equipment. Loads frequently approach hoist capacity. Periods of utilization are infrequent and widely scattered. Hoist is idle 1 to 6 months between periods of operation.
H2	**Light Service**	Light machine shop, fabrication, service, and maintenance work. Loads and utilization are randomly distributed. Rated loads are infrequently handled. Total running time does not exceed 10 – 15% of the work period.
H3	**Standard Service**	General machine shop fabrication, assembly storage & warehousing. Loads and utilization are randomly distributed. Total running time does not exceed 25% of the work period.
H4	**Heavy Service**	High volume handling of heavy loads, frequently near rated capacity. Steel warehouses, machine shops, fabricating plants, mills & foundries. Heat treating and plating applications. Total running time approaches 25-50 % of the work period.
H5	**Severe Service**	Bulk handling of material in combination with buckets, magnets, etc. Duty cycles approach continuous operation are frequently necessary. Equipment is often cab operated.

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Crane Classifications

Crane Manufacturers Association of America Specification #70

Duty Class	Service Classification	Typical Areas of Application
A	**Infrequent or Standby Service**	This service class covers cranes which may be used in installations such as power houses, public utilities, turbine rooms, motor rooms and transformer stations where precise handling of equipment at slow speeds with long, idle periods between lifts are required. Capacity loads may be handled for initial installation of equipment and for in frequent maintenance.
B	**Light Service**	This service covers cranes which may be used in repair shops, light assembly operations, service buildings, light warehousing, etc. where service requirements are light ad the speed is slow. Loads may vary from no load to occasional full rated loads with 2-5 lifts per hour, averaging 10 feet per lift.
C	**Moderate Service**	This service covers crane which may be used in machine shops or paper mill machine rooms, etc. where service requirements are moderate. In this type of service the crane will handle loads which average 50% of the rated capacity with 5 – 10 lifts per hour, averaging 15 feet. Not over 50% of the lifts are at rated capacity.
D	**Heavy Service**	This service covers cranes which may be used in heavy machine shops, foundries, fabricating plants, steel warehouses, container yards, lumber mills, etc. and standard duty bucket and magnet operations where heavy duty production is required. In this type of service, loads approaching 50% of the rated capacity will be handled constantly during the working period. High speeds are desirable for this type of service. With 10-20 lifts per hour averaging 15 feet, not over 65% of the lifts are rated capacity.
E	**Severe Service**	This type of service required a crane capable of handling loads approaching a rated capacity through its life. Applications may include magnet, bucket, magnet bucket combination cranes for scrap yards, cement mills, lumber mills, fertilizer plants, container handling, etc. with twenty or more lifts per house at or near the rated capacity.
F	**Continuous Severe Service**	This type of service requires a crane capable of handling loads approaching rated capacity contin-uously under sever service conditions throughout its life. Applications may include custom designed specialty cranes essential to performing the critical work, tasks affecting the total production facility. These cranes must provide the highest reliability with special attention to ease of maintenance.

AIST Class for Mill Duty

Service Class	Cycle Range	Material Handling Duty
1	Less than 100,000	Light
2	100,000 to 500,000	Medium
3	500,000 to 2,000,000	Heavy
4	Over 2,000,000	Severe

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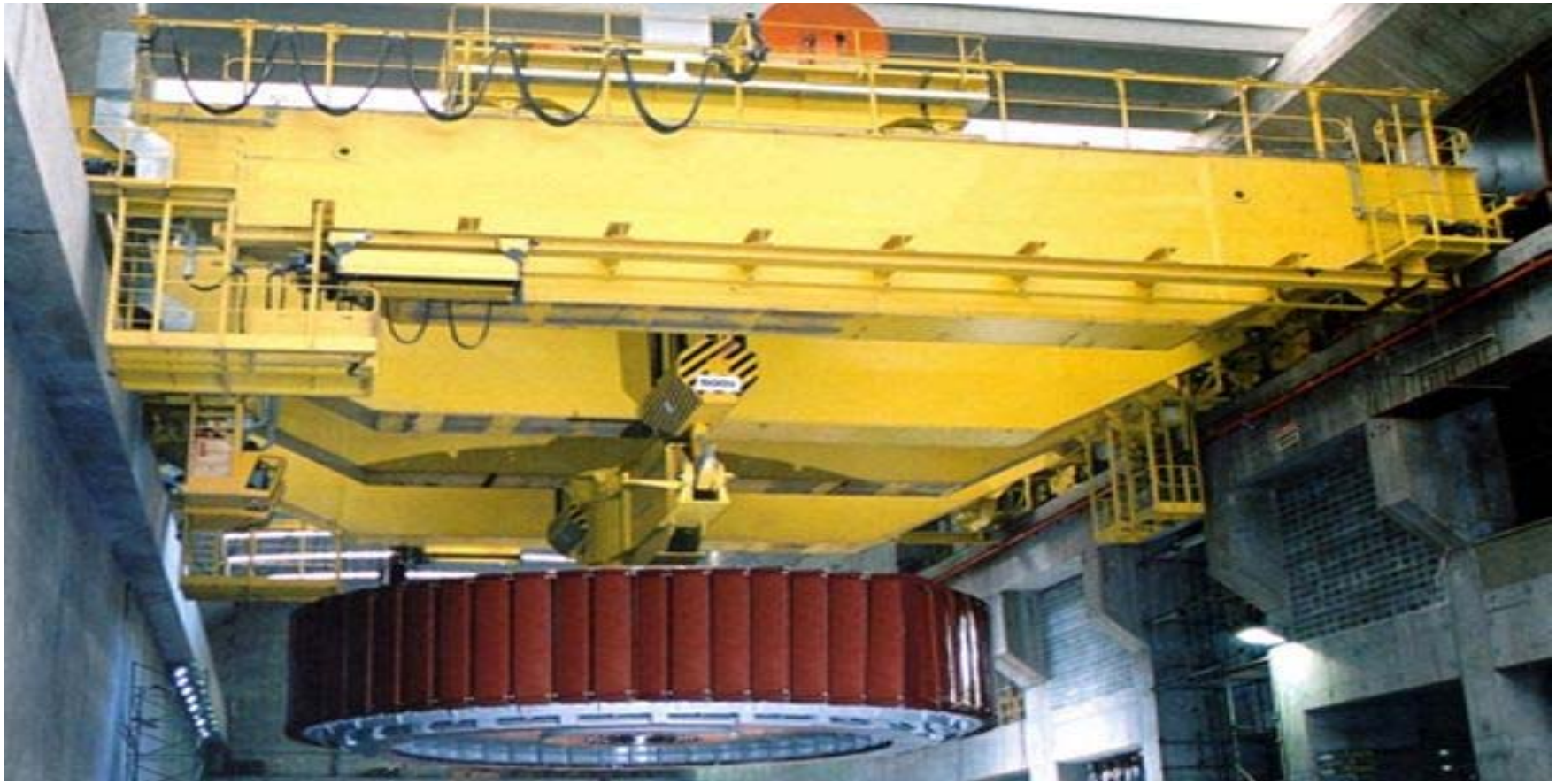
Crane Classifications



<u>Class A</u> - Standby or Infrequent use

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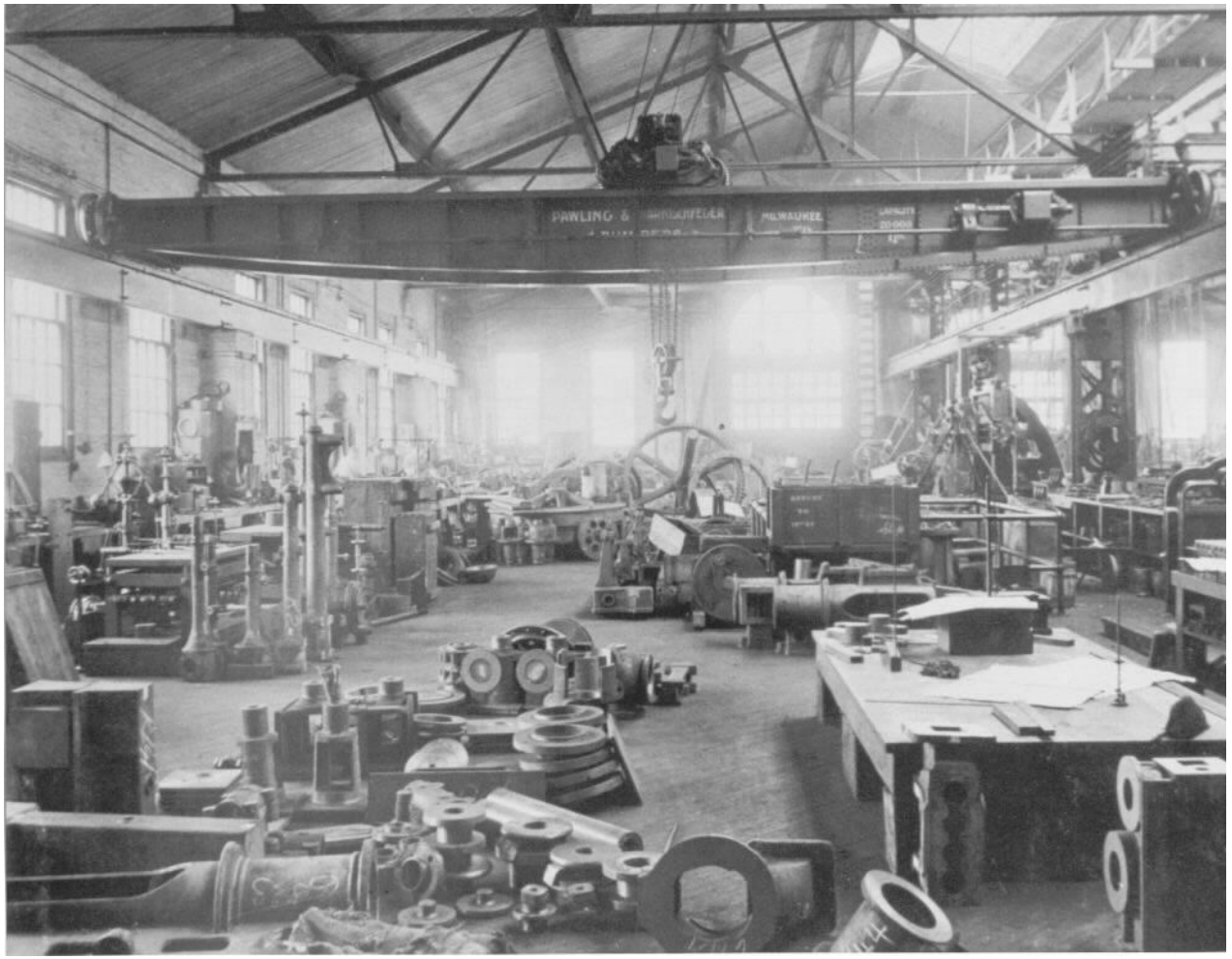
Crane Classifications

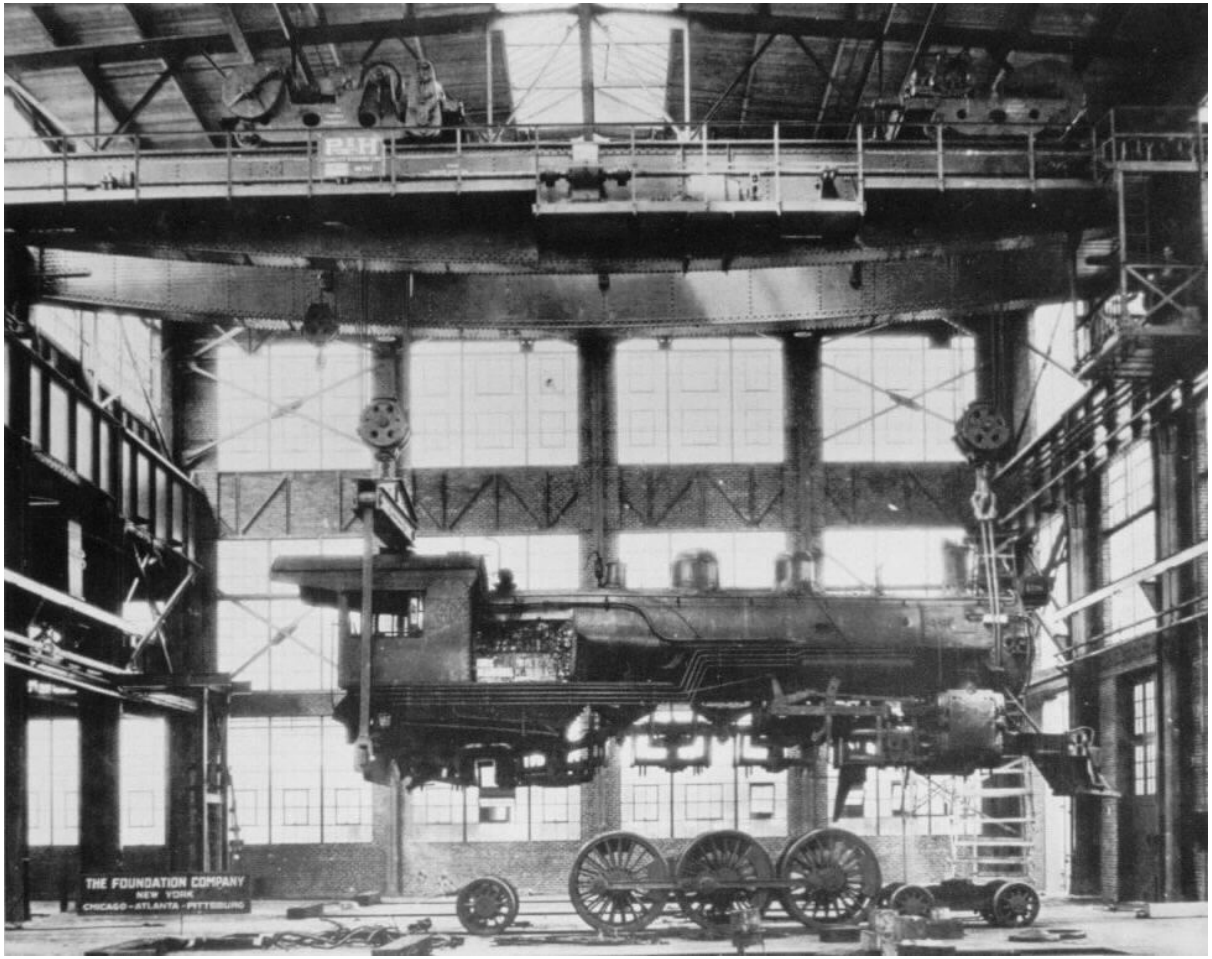
<u>Class B</u> – Light Service

Crane Classifications



<u>Class C</u> – Moderate Service

Crane Classifications



<u>Class D</u> – Heavy Duty

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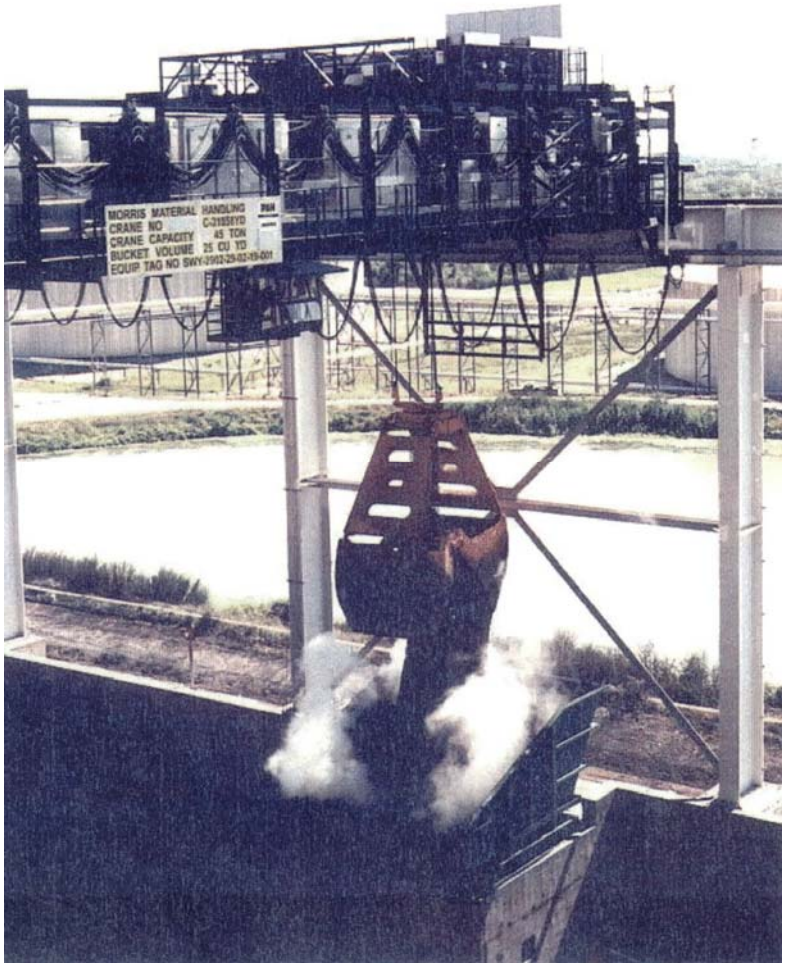
Crane Classifications



<u>Class E</u> – Severe Duty

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Crane Classifications

<u>Class F</u> – Continuous Severe

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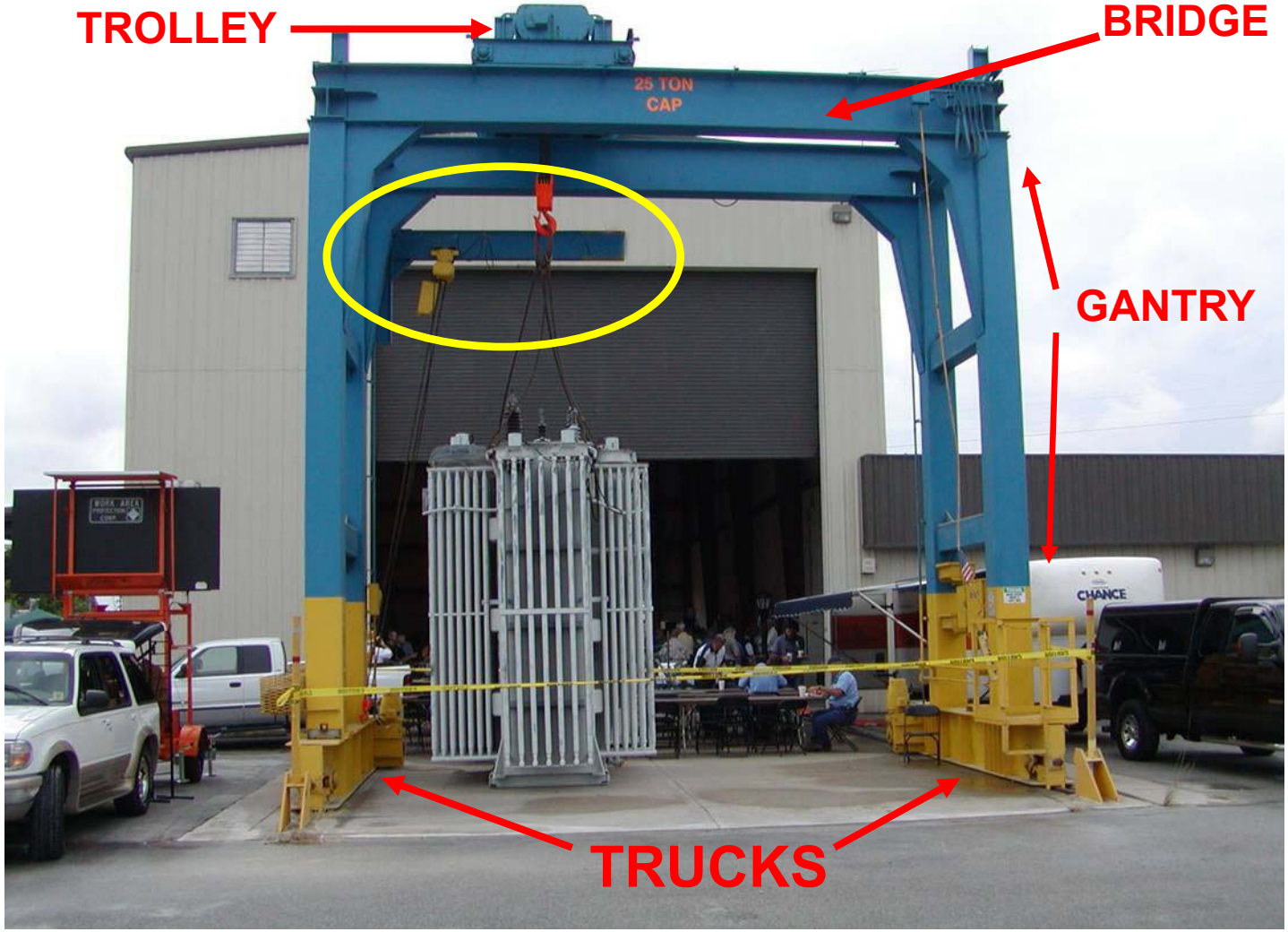
Top Running Gantry

OSHA 1910.179
ASME B30.11/30.17

ASME B30.2
ASME B30.16



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ASME B30 Standards

ASME B30._____

. 2 Overhead & Gantry Cranes

.10 Hooks

.11/.17 Monorails & Underhung Cranes/Top Running Bridge with Under Running Hoist

.16 Overhead Hoists Underhung

.20 Below the Hook Devices

.21 Manual Lever Hoists

ASME B30 Standards

B30.16-_____

- **0 = Scope, Definitions and References**
- **1 = Construction and Installation**
- **2 = Inspection, Testing and Maintenance**
- **3 = Operation**

Most of the standards follow this pattern of numbers.

Questions??

Thanks for your attention,
let's take a break!

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