



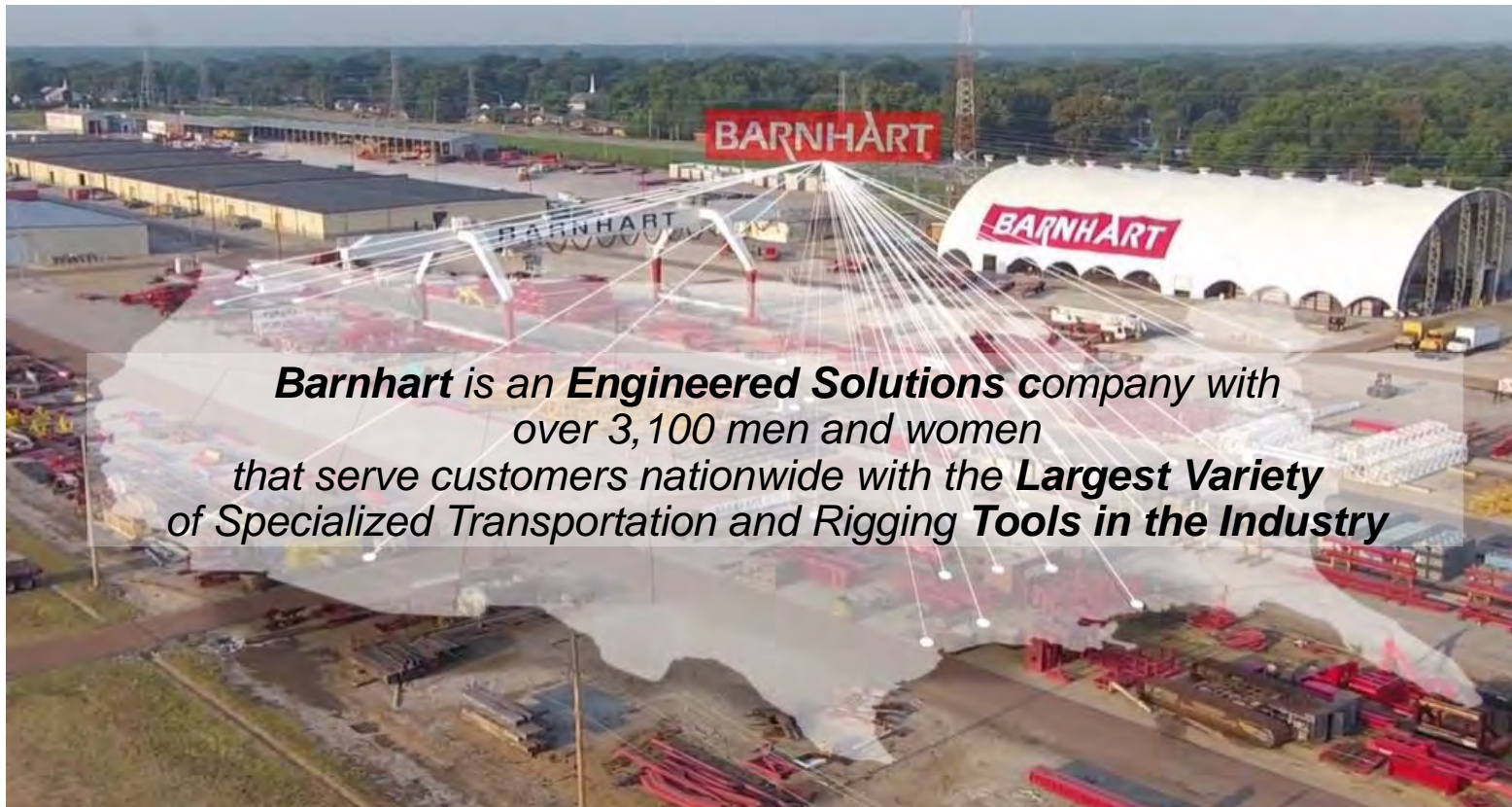
NORTHWEST
CONSTRUCTION
CONSUMER
COUNCIL

BARNHART

Preparing for Successful Lifts



ABOUT BARNHART



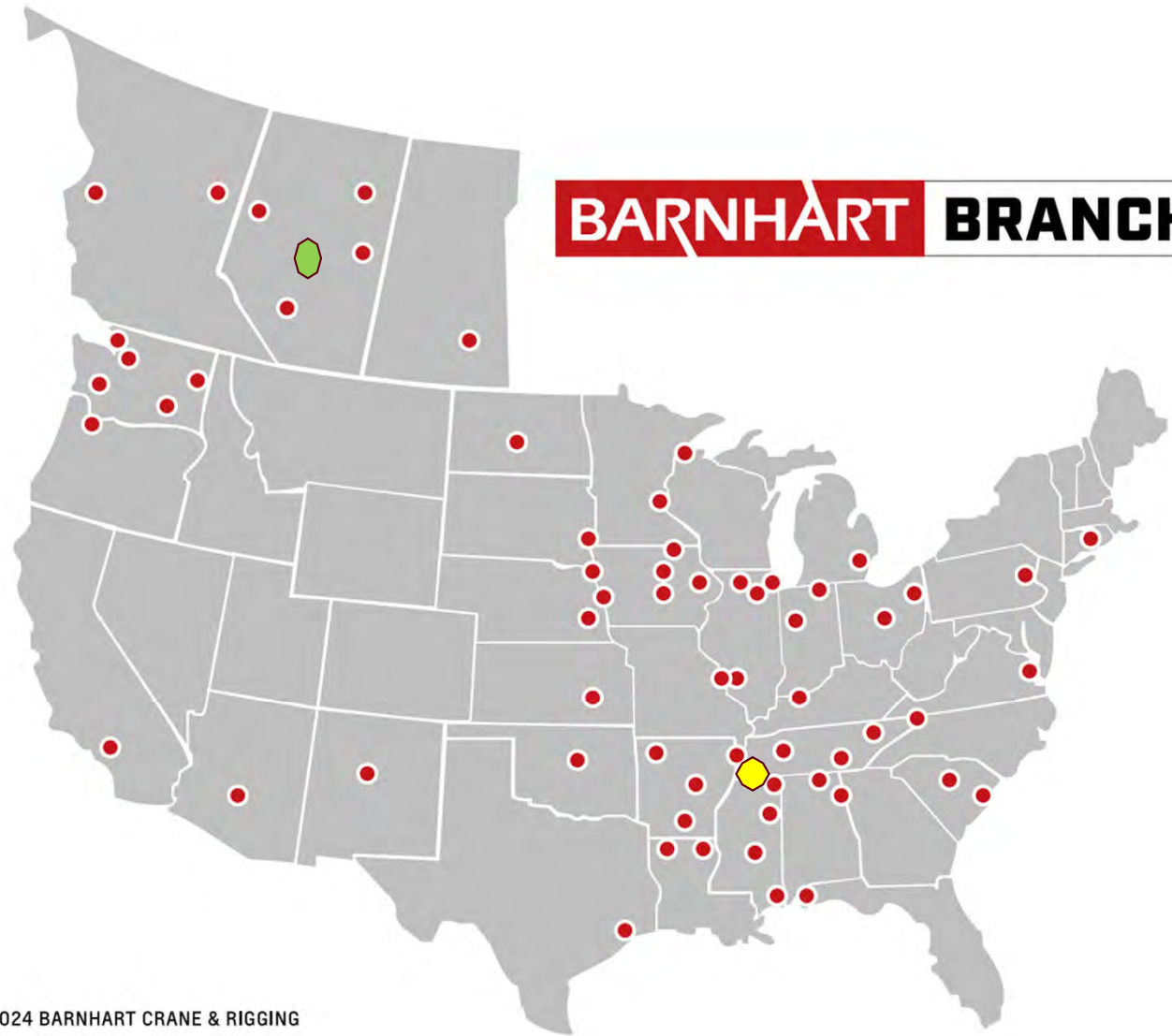
Barnhart is an Engineered Solutions company with over 3,100 men and women that serve customers nationwide with the Largest Variety of Specialized Transportation and Rigging Tools in the Industry

BARNHART CRANE BRANCH NETWORK

BARNHART BRANCHES

✦ **NCSG Headquarters**
Edmonton, AB

✦ **Barnhart Headquarters**
Memphis, TN



2024 BARNHART CRANE & RIGGING



BARNHART

“THE BIG 0”

- **BARNHART 12 YEARS**
- **PART OF AN ACQUISITION IN 2012**
- **CRANE AND RIGGING SINCE 2004**
- **FIELD LEADER**
- **INDUSTRIAL SALES**
- **REFINING PROJECT MANGER**
- **OPERATIONS MANAGER**
- **NORTHWEST SALES MANAGER**
- **REGIONAL DEVELOPMENT DIRECTOR**







15-169
993454 LB
(450715 IG)

BARNHART





BARNHART

HOW DID WE GET HERE

A HISTORY OF CHALLENGES

HOW DID WE GET HERE

CRANE ACCIDENTS ACROSS THE U.S

- Numerous Accidents in the 1980's and 1990's
- Many ended in Fatalities
- 1994 Kingdome Crane Accident
- 2006 Bellevue Tower Crane Collapse





▪ **OSHA States- Not Washington**

- Started revisiting Crane Safety in 1990's- Early 2000's to address growing complexity.
- 2003 OSHA (C-DAC)
- 2010 OSHA's Crane and Derricks Rule
- November 2018 OSHA fully implemented the crane operator certification requirements nationwide.



▪ Washington L&I

- 2007 State Legislation Passed into law that all crane operators be certified by July 1st 2010.
- This was completed before OSHA
- Driven by the high-profile accidents at Kingdome and Bellevue 333.



Key Roles and Responsibilities

Introduced by OSHA & WAC in 2010



BARNHART

LIFT PLANNING AS AN OWNER

SPREADING THE RISK

BARNHART

1- EVALUATE YOUR RISK PROFILE

- Bare Rental of Crane
- Operated and Maintained Crane Support
- O&M with Composite crew
- Turnkey Service





BARE RENTAL

- Crane Company “leases” Crane to Customer
 - Often A/D is provided during initial assembly
- Customer Supplies:
 - The Operator
 - Insures they are certified and qualified
 - The Riggers, Signalman.
 - The Lift Director
 - Responsible for crane inspections
 - Provides all insurance, fuel, ect.
 - Customer is the site supervisor
- Often lowest cost as you are just renting equipment
- Most risk as the “Customer” owns almost all the risk

OPERATED AND MAINTAINED

- Crane Company “rents crane and crew” to customer
 - A/D is provided during initial assembly
 - Crane Company supplies the operator
 - Crane Company responsible for maintenance
- **Customer Supplies:**
 - The Riggers, Signalman
 - The Lift Director
 - Customer is the Site Supervisor
- Good if customer is familiar with hoisting and its requirements
- Insurance is typically agreed though contracts
- Lower cost, some of the risk is taken by Crane Company





O&M COMPOSITE CREW

- **Crane Company “rents crane and crew” to customer**
 - A/D is provided during initial assembly
 - Crane Company supplies the operator
 - Crane Company responsible for maintenance
- **Customer Supplies or the Crane Company:**
 - The Riggers, Signalman
 - The Lift Director
 - Customer is the Site Supervisor



TURNKEY LIFTING SERVICE

- **Crane Company is contracted by the customer**
 - A/D is provided during initial assembly
 - Crane Company supplies the operator
 - Crane Company responsible for maintenance
 - Crane Company supplies the riggers, signalman
 - Crane Company supplies Lift Director
 - Crane company may supply/approve all lift plans
- **Customer Supplies:**
 - Customer is still the Site Supervisor
- Most risk taken by Crane and Rigging Contractor
 - Site Supervisor still has responsibility


CHOOSING A PARTNER

BARNHART

2- SELECT A REPUTABLE CRANE COMPANY PARTNER

- Established Standard Operating Procedures
- Robust training and qualification process
- Proper Planning and Documentation
- Management of Change Process



 Minds Over Matter	A/D of Cranes, Booms, Jibs and Luffers Standard Operating Procedures	Number: ENG - SOP - 024
		Revision: 2.0
		Approval Date: 13 July 2020

0.1 SCOPE

This procedure defines and establishes requirements for the assembly and disassembly of cranes. Every crane that is assembled or disassembled – this includes inserting hydraulic booms, super lifts, lattice booms, jibs, jib inserts, luffers, and swing away jibs – must have a competent and qualified person on site directing the assembly or disassembly. [Barnhart MLT is also included.] This SOP has been prepared to stipulate specific policies, rules, and guidelines for all Barnhart Crane and Rigging Crane A/D Directors and their crews, including all temporary and contracted employees. This policy is in compliance with §1926.1403 - §1926.1406, §1926.1412(c), §1926.1423(f) and §1926.1424(a). These policies are to be observed and followed on all jobs. It shall be BC&R's responsibility to establish, implement, and maintain the intent and practice of this policy. If you have any questions concerning the policies or statements contained in this manual, please ask your Supervisor.

0.2 PROCEDURE CONTENTS

1.0 RESPONSIBILITIES	2
2.0 A/D DIRECTOR QUALIFICATIONS [§1926.1404(a)]	3
3.0 CRANE ASSEMBLY AND DISASSEMBLY GENERAL PROCEDURES	4
3.1 KNOWLEDGE OF THE MANUFACTURER'S PROCEDURES [§1926.1404(b)]	4
3.2 PROTECT AND INFORM THE CREW [§1926.1404(e)]	4
3.3 ADDRESS JOB HAZARDS AND ENSURE SAFE OPERATION [§1926.1404(h)]	5
3.4 POST ASSEMBLY INSPECTION [§1926.1412(c)]	6
3.5 WORK AREA CONTROL [§1926.1424]	6
4.0 LATTICE BOOM DISASSEMBLY SPECIFIC PROCEDURES [§1926.1405]	7
5.0 BARNHART MODULAR LIFT TOWER	7
6.0 FALL PROTECTION [§1926.1423(f)]	7
7.0 REFERENCES	8

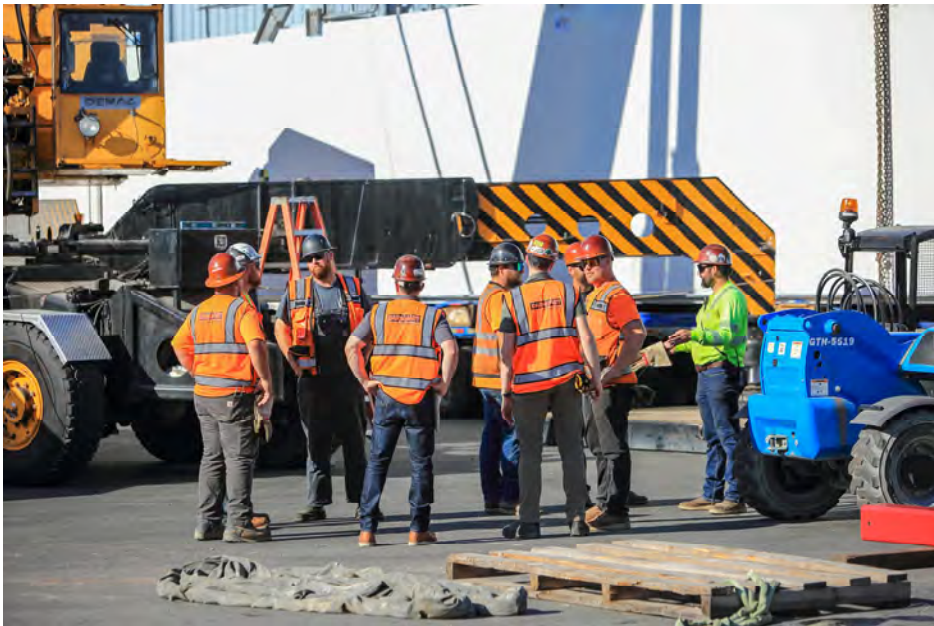
Revision	Date	Change Details
0.0	20 Oct 2010	Initial Release
1.0	16 Mar 2011	Modification of Header and Footer
1.1	12 May 2011	Change of document number
1.2	25 May 2011	Added sections 5.0 on MLT and 7.0. Added more specifics for 1926.1404.
2.0	13 July 2020	Added section 3.5 Work Area Control [1926.1424]

Author: DRP – Director of Safety and Quality	Approver: RGK – SVP Technical Services	Page: 1 of 8
---	---	-----------------

STANDARD OPERATING PROCEDURES

- Standardized set of policy and procedures that are agreed
 - Common across all work groups
 - Address the correct standards, rules and laws.
 - Are live documents that are accessible to work groups.
- **Cribbing SOP Example**

TRAINING AND QUALIFICATIONS



- **Certified - Qualified – Competent**

- How is the Crane and Rigging Company Training:
 - Documented evaluation testing.
 - Third party
 - Employers' evaluation
- **Certified and Qualified Operators**
- **Qualified rigger** as outlined in **WAC 296-155-53306**.
- **Qualified Signal** person as outlined in **WAC 296-155-53302**.
- **Lift Director (Proposed Language)**

TRAINING AND QUALIFICATIONS

Current Standard: WAC 296-155-533. Nothing listed.

Proposed Draft: WAC 296-155-53301. Lift Director qualifications.

(1) The lift director must meet the qualification requirements prior to using a crane/equipment to perform hoisting activities. A lift director is required to be present and directly oversees all work that is being performed by a crane and the associated rigging crew. This requirement must be met by using either Option (1) or Option (2).

(a) Option (1) - Third-party qualified evaluator. The lift director has documentation from a third-party qualified evaluator showing that the lift director meets the qualification requirements listed in subsection (3) of this section.

(b) Option (2) - Employer's qualified evaluator. You have your qualified evaluator assess the individual and determine that the individual meets the qualification requirements listed in subsection (3) of this section and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable meaning other employers are not permitted to use this qualification to meet the requirements of this section.

(c) You must make the documentation for whichever option is used available at the site while the lift director is employed by the employer. It may be in digital format.

(2) If subsequent actions by the lift director indicate that the individual may not meet the qualification requirements listed in subsection (3) of this section, you must not allow the individual to continue working as a lift director until retraining is provided and a reassessment is made in accordance with subsection (1) of this section that confirms that the individual meets the qualification requirements.

(3) Each lift director must:

(a) Be a current qualified rigger as outlined in WAC 296-155-53306 Rigger Qualifications.

(b) Be a current qualified signal person as outlined in WAC 296-155-53302 Signal person qualifications.

(4) Qualification requirements. Each lift director must:

(a) Know and understand the relevant requirements of WAC 296-155-53401(6) Duties of Assigned Personnel.

(b) Know and understand the relevant requirements of WAC 296-155-53408 Power Line Safety.

QUALIFICATIONS CONTINUED

Proposed Draft: WAC 296-155-53301. Lift Director qualifications.

(c) Know and understand the relevant requirements of WAC 296-155-56420 Operator Certification Written examination technical knowledge.

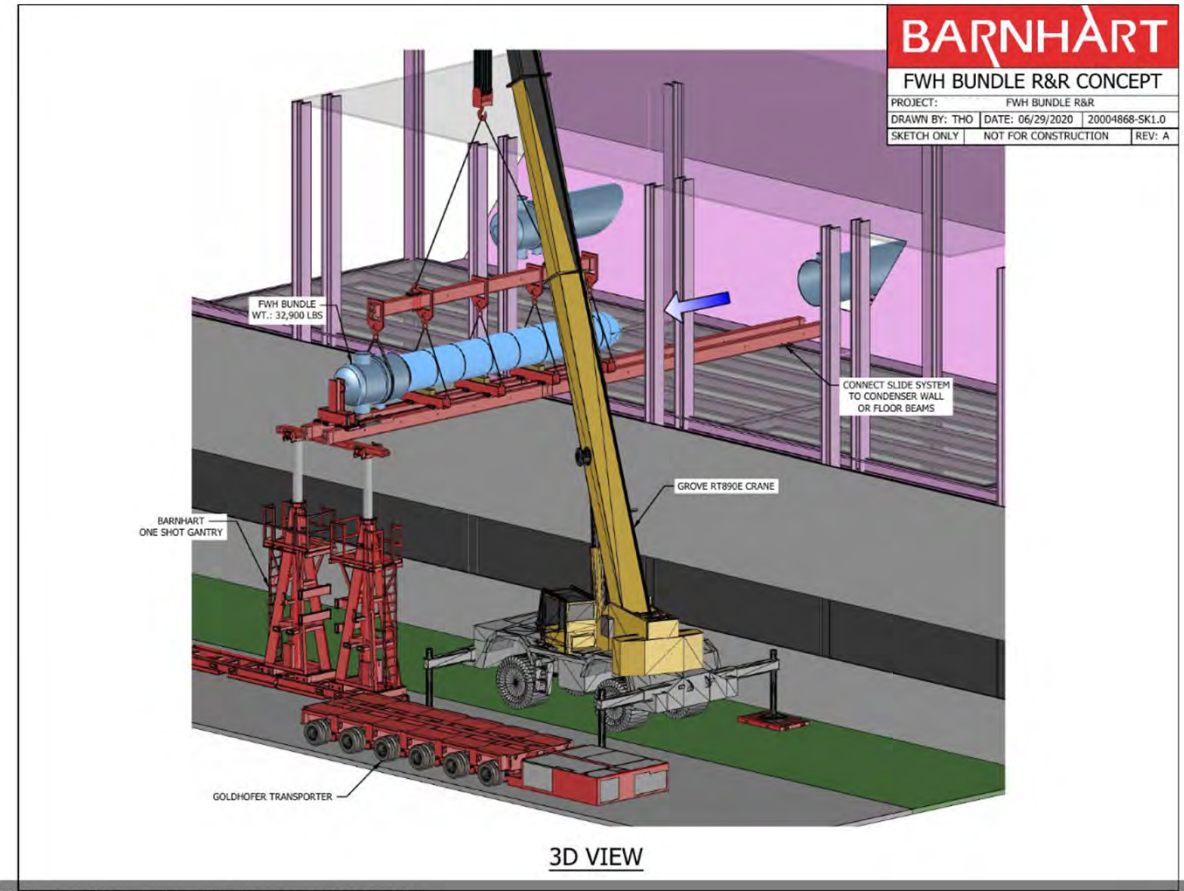
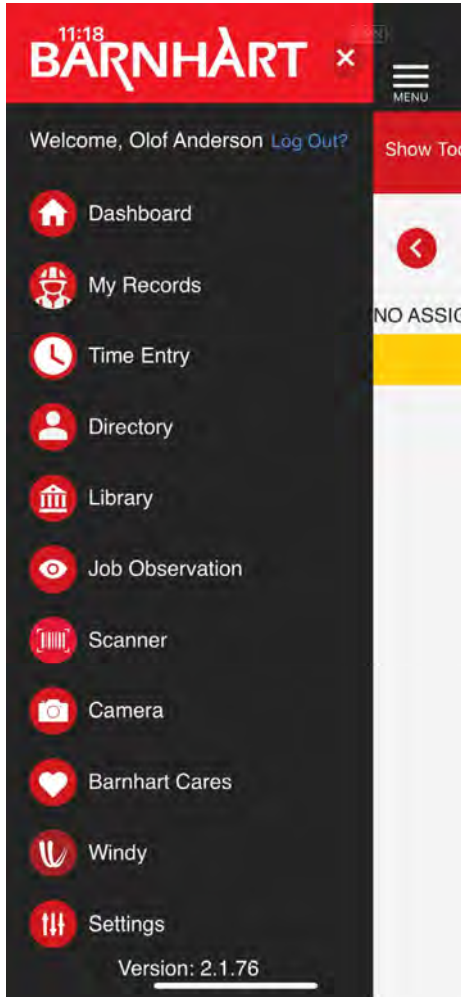
(d) Know and understand the relevant requirements of ASME P30.1 Planning for load handling activities, as applicable.

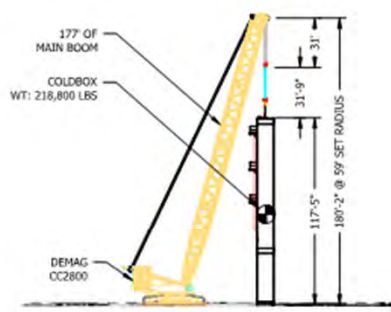
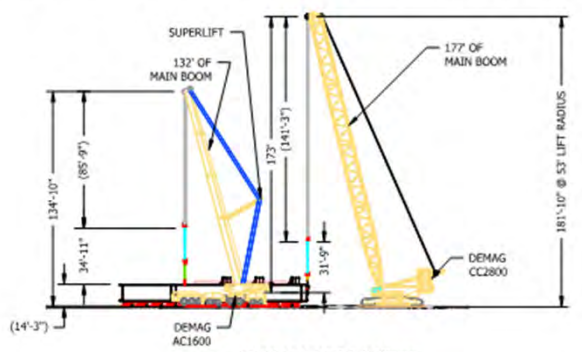
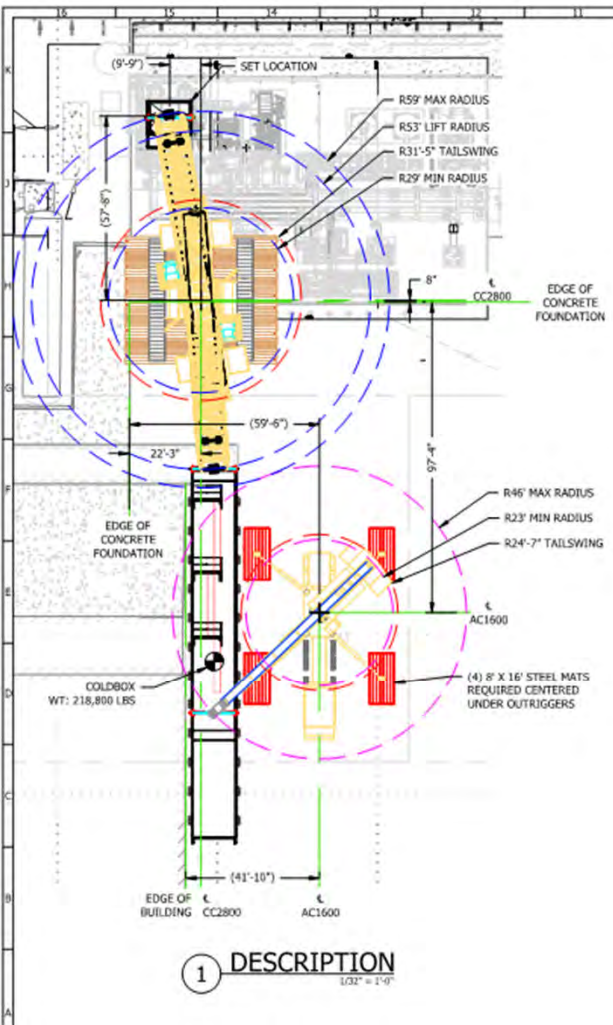
(e) Demonstrate that they meet these requirements of this subsection through a written test containing questions based on (a) through (d) of this section. All tests must be documented and provided upon request.

(5) Qualification period. A lift director qualification may not exceed a 5-year period; this qualification must be renewed every 5 years to ensure lift directors maintain qualified status. This renewal must include a documented written exam.

(6) During the assembly, disassembly or climbing/jumping work of a tower crane, a lift director shall NOT perform combined duties listed in WAC 296-155-53401. For example, a lift director and an A/D director, lift director and crane operator, or lift director and rigger. The lift director may assist in rigging or signaling.

PLANNING AND DOCUMENTATION





- GENERAL NOTES:**
1. DIMS AND SPACING TO WITHIN 1/8" DIMS IN PARENTHESES ARE FOR REFERENCE ONLY.
 2. COLDBOX DIMENSIONS, WEIGHT, & CENTER OF GRAVITY LOCATION PER MANUFACTURER DRAWING.
 3. "REISSUE, DIMENSION CHANGING, OR COLDBOX".
 4. SITE LAYOUT, DIMENSIONS, AND CLEARANCES PER DRAWINGS. VARIAS RENT WA STRUCTURAL, NOTED "PAGES 4 AND 12 RECEIVED 6/15/24".
 5. MAXIMUM GROUND BEARING PRESSURE APPLIED IS 5.317 PSF FOR FH288415 ECLUB. BOX HAS NOT DETERMINED THE ADEQUACY OF THE GROUND TO SUPPORT THE IMPOSED LOAD.
 6. DETERMINATION OF ADEQUACY IS THE RESPONSIBILITY OF OWNER.
 7. CRANE PAD SHALL BE SET UP LEVEL TO WITHIN 1" IN 10' IN ANY DIRECTION.
 8. MAX WIND SPEED = 25.8 MPH.
 9. ALL CRANE SETUP & OPERATIONS FOR ENG-SOP-001, U.S.D.
 10. APPROVED BY: [Signature] FOR AND CAPTIONED: [Signature] SET

MAIN CRANE DATA				
DEMAG CC2800				
397,000	LB. OF CRANE COUNTERWEIGHT			
177	OF MAIN BOOM			
32,550	LB LINE PULL			
8	PARTS OF LINE			
260,000	LB LINE PULL CAPACITY			
TAIL ANALYSIS - COLDBOX				
5-SHEAVE BLOCK =	10,500 LB			
RIGGING =	3,235 LB			
COLDBOX =	218,800 LB			
TOTAL LOAD =	232,535 LB			
89% OF LINE PULL CAPACITY				
MAX RADIUS				
CAP. @ R59' =	275,400 LB			
85% OF CRANE CAPACITY				
TAIL CRANE DATA				
DEMAG AC1600 SL				
216,000	LB. OF CRANE COUNTERWEIGHT			
132	OF MAIN BOOM			
OUTRIGGERS FULLY EXTENDED				
26,950	LB LINE PULL			
8	PARTS OF LINE			
215,200	LB LINE PULL CAPACITY			
TAIL ANALYSIS - COLDBOX				
7-SHEAVE BLOCK =	6,000 LB			
RIGGING =	2,132 LB			
COLDBOX =	172,200 LB			
TOTAL LOAD =	180,332 LB			
84% OF LINE PULL CAPACITY				
MAX RADIUS				
CAP. @ R46' =	268,000 LB			
67% OF CRANE CAPACITY				
PRELIMINARY ONLY				
00	ISSUED FOR CUSTOMER REVIEW	7/8/2024	BPH	
REV. #	DESCRIPTION	DATE	DWN	CHK
REVISION HISTORY				
PROJECT: AIR LIQUIDE COLDBOX SET				
CUSTOMER: AIR LIQUIDE				
BARNHART		MINDS OVER MATTER		
		TITLE: COLDBOX TAIL LAYOUT		

2.5 Management of Change

SCOPE

This Management of Change (MOC) procedure ensures that job changes, occurring in the initiation, planning and/or execution phases, do not result in unsafe practices, loss of revenue, or unknowingly increased risk without proper management oversight.

RESPONSIBILITY

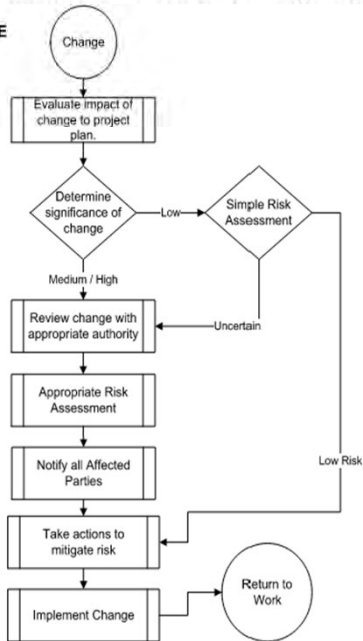
The President is responsible for all actions defined in this procedure and for the provision of adequately trained resources.

The COO or SVPs Branch Operations are responsible for reviewing the process and ensuring it is being followed.

Regional Directors and Branch Managers are responsible for reviewing and approving appropriate changes and ensuring that their employees are properly trained in this procedure.

The Project Manager is responsible for assessing changes on his projects, taking appropriate actions, and ensuring field leaders understand how to assess and manage change while executing jobs.

PROCEDURE



NOTES
Change can occur in any approved process step such as: sales, job initiation, planning, engineering, and execution.
Evaluate and assess impact that change will or could have on job.
Review change with appropriate authority. For example, if scope changes on project, contact Branch Manager; if engineering changes, contact project engineer.
If job has a risk manager, they will be involved in this discussion.
Affected Parties could include: site owners, customers, other contractors, sub-contractors, suppliers.
Once risk has been appropriately assessed, take actions to mitigate risk.
Implement change and return to work.
**Some changes will require written approval or signed documents before executing.

MANAGEMENT OF CHANGE PROCESS

- What happens when the details change?
 - Plans change, how are those changes identified?
 - Does the team get the right people in the “boat”

GOING TO WORK

BARNHART

3 – PLAN YOUR WORK- WORK YOUR PLAN

- Establish and Understand the Roles you are Fulfilling
- Load Handling Considerations
 - Standard Lift
 - Critical Lift
- Gather the Correct Documents



KNOW YOUR ROLE

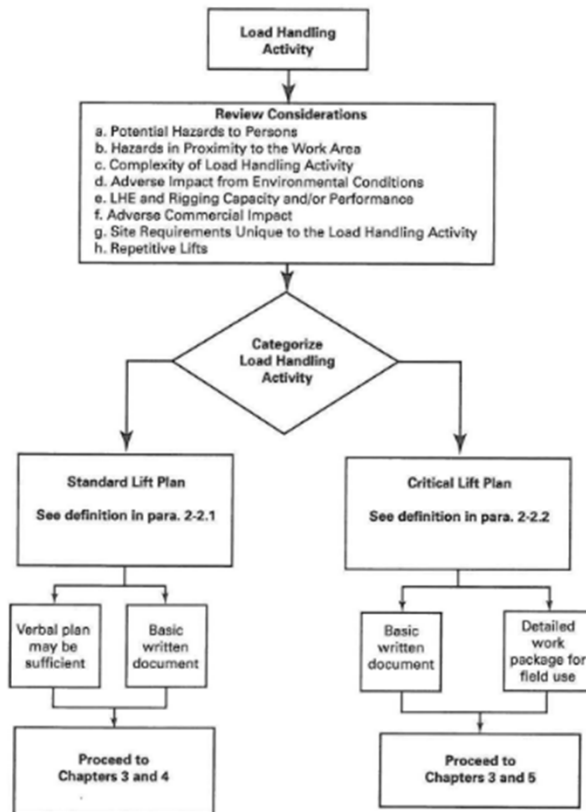
BARNHART



- **WHAT ROLES ARE YOU FULLFILLING**
- **DO THOSE PEOPLE KNOW THEIR ROLES**
- **IS THERE AGREEMNT IN THE ROLES**
- **ARE THE ROLES CLEARLY DOCUMENTED**

BARNHART

LOAD HANDLING ACTIVITY CONSIDERATIONS



Standard Lift Plan: A standard lift plan is a proposed load handling activity plan in which considerations in section 2-1 have been evaluated and it has been determined that the load handling activity can be accomplished through standard procedures, and the load handling activity personnel can execute using common methods, materials, and equipment.

Critical Lift Plan: A critical lift plan is a proposed load handling activity plan in which considerations in sections 2-1 have been evaluated, and it has been determined that the load handling activity exceeds standard lift plan criteria and requires additional planning, procedures, or methods to mitigate the greater risk.

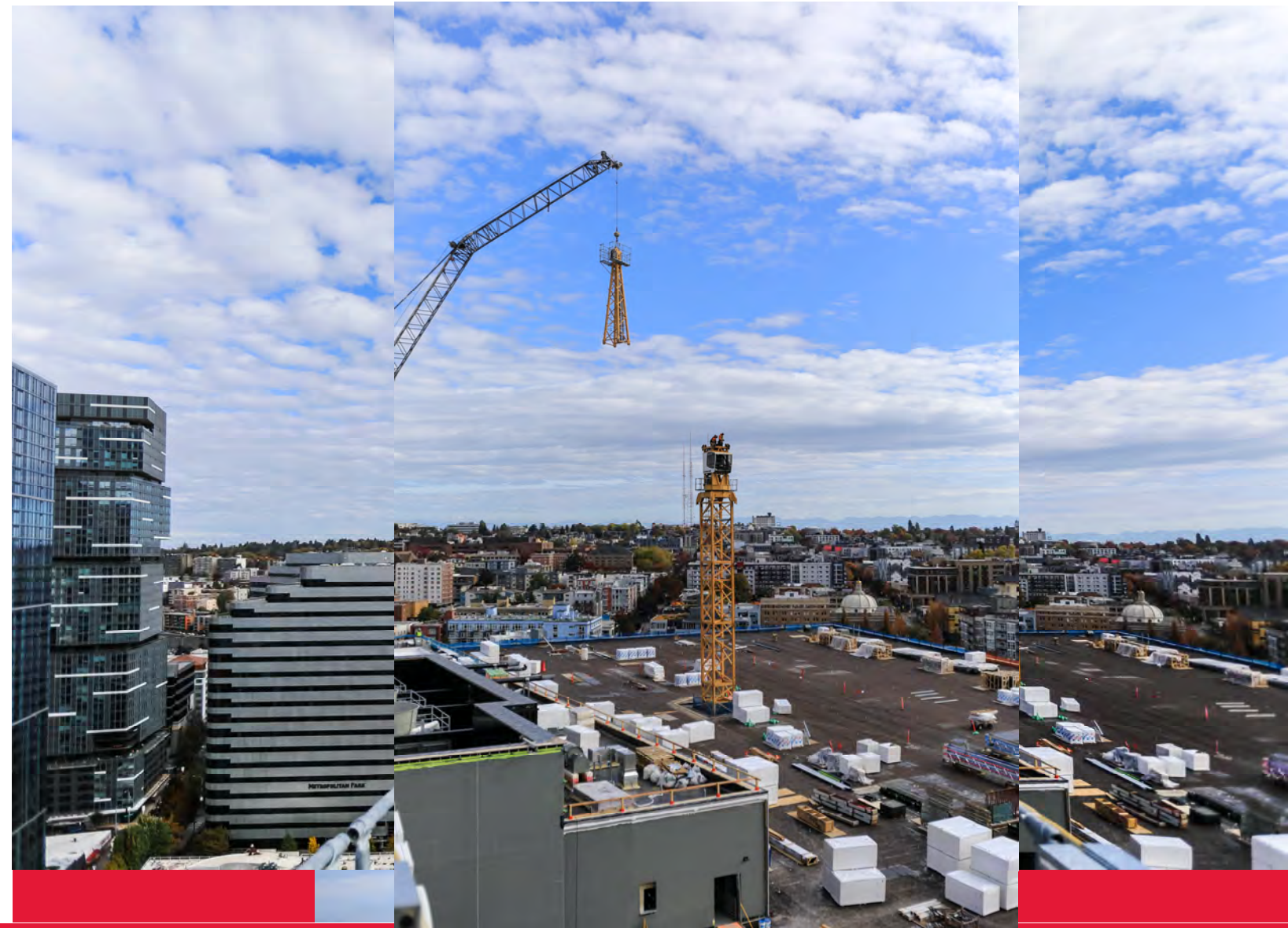
GATHER CORRECT DOCUMENTS

BARNHART



- **PEOPLE**
 - Certifications, Qualifications, NCCCO
- **PLAN**
 - Lift Plans, Equipment Drawings
 - PSF Requirements, Street Use Permits
 - Rigging Diagrams
- **EQUIPMENT**
 - 3rd Party Inspections
 - Wire Rope Certs
 - Daily Inspections
 - Assembly Disassembly Paperwork

BARNHART



BARNHART

The background of the slide is a photograph of industrial machinery, possibly a power plant or refinery, with a semi-transparent red overlay. A diagonal white cutout is present on the right side of the image. The text is overlaid on the red area.

BARNHART

**HOW ARE YOU SERVING?
YOUR CUSTOMERS**