If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

8.25.b C-AD Rigging Inventory and Inspections Forms

Text Pages 2 through 3

C-A OPM Procedures in which this Attachment is used.		
8.25		

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

J. Scott

8.25.b C-AD Rigging Inventory and Inspections Forms

1. Purpose

Describe use of C-AD Rigging Inventory Form and various rigging inspections forms for C-AD personnel.

2. Responsibilities

Note:
All personnel performing any material handling require "Material Handling MED Surveillance" GE-56C.

2.1 All personnel performing inspections are required to have training appropriate to equipment being inspected.

2.1.1 For below-the-hook rigging equipment basic rigging GE-56B.

2.1.2 For cranes, hoists, pallet jacks, lift tables, Overhead Crane Training, GE-56, and Basic Rigging GE-56B, are required.

2.1.3 For forklifts and Forklift Practical, GE-57 is required.

2.1.4 For manlifts, practical training on lift from Plant Engineering or a designated examiner is required.

3. Procedures

3.1 Annually Line Supervisor, or designated personnel, shall assist Plant Engineering and C-AD ESSHQ in inspections of rigging equipment and inventory update as per C-A-OPM 8.25.

3.2 Line Supervisor, or designee, is responsible to perform monthly crane inspection and maintain book of completed inspections for review.

3.3 Prior to use of equipment, the appropriate Daily/Pre-Use Inspection shall be performed on equipment. No records of these inspections are required to be documented.

3.4 If any problems are encountered, equipment can be taken out of service for Plant Engineering repair. If not repairable, discard equipment and e-mail J. Scott (C-

AD Environmental Coordinator – jscott@bnl.gov), or D. Passarello (C-AD Quality Assurance Representative – passare1@bnl.gov) to update inventory.

3.5 New equipment ordered has to be ordered on a purchase order and required certifications and load tests as per SBMS Subject Area must be obtained. Equipment certifications and load tests documentation must be sent to ESSHQ QA Group Leader for retention.

4. Inventory and Inspection Forms – Forms are available from SBMS Subject Area "Lifting Safety".

4.1 Rigging Inventory Data Sheet
4.2 Daily/Prior-to-Use Sling Inspection Checklist
4.3 Daily/Prior-to-Use Rigging Hardware Inspection/Removal Criteria
4.4 Daily/Prior-to-Use Overhead Crane/Hoist Inspection Checklist
4.5 Overhead Crane Monthly Inspection Report
4.6 Daily/Prior-to-Use Electric Forklift Inspection Checklist
4.7 Daily/Prior-to-Use Internal Combustion Engine Forklift Inspection Checklist
4.8 Daily/Prior-to-Use Aerial Lilfts Inspection Checklist

5. References

5.1 SBMS Subject Area "Lifting Safety".
5.2 DOE Standard "Hoisting and Rigging".
5.3 SBMS Subject Area "Forklift Safety".

Attachment 4.1 Rigging Inventory Data Sheet

Bldg.	Type	Capacity	Hold	ID	Manufacturer	Description/Model	BNL MMC Tag On	Length	Insp. Date	P/F	Supervisor	Group	Comments

Attachment 4.2

DAILY (FREQUENT) SLING INSPECTION CHECKLIST

REMOVE SLING(S) FROM SERVICE IF THE BNL INSPECTION TAG DUE DATE HAS EXPIRED, THE TAG IS MISSING OR ILLEGIBLE OR IF ANY OF THE FOLLOWING CONDITIONS ARE PRESENT:

WIRE ROPE SLINGS:

- ❑ Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand.
  NOTE: One or more randomly distributed broken wires should prompt the user to conduct a more detailed inspection.
- ❑ Wear or scraping of one-third the original diameter of the outside individual wire.
- ❑ Kinking, crushing, birdcaging, or any other damage resulting in distortion of rope structure.
- ❑ Evidence of heat damage, acid or caustic burns.
- ❑ End attachments that are cracked, deformed, or worn.
- ❑ Corrosion of the rope or end attachments.
- ❑ Missing or illegible capacity tag.

SYNTHETIC WEB SLINGS:

- ❑ Acid or caustic burns.
- ❑ Melting or charring of any part of the surface.
- ❑ Snags, punctures, tears, or cuts.
- ❑ Broken or worn stitches.
- ❑ Wear exceeding the amount recommended by manufacturer.
- ❑ Missing or illegible capacity tag.

TWIN-PATH SLING (Polyester or Polypropylene jacketed):
Note: Each manufacturer has different wear indicators and inspection criteria, check specific manufacturer's inspection criteria.

- ❑ Tell-Tails should extend past tag area of each sling, snags, punctures,, tears or cuts.
- ❑ Evidence of cutting, or tearing of outer cover, broken or worn stitching.
- ❑ Evidence of heat damage, Polyester or Cordura; covers should not be exposed to temperatures above 90 deg. C / 194 F. Normex covered slings; over 149 C / 300 F, Spectra covered slings over 65C / 150F, acid or caustic burns.
- ❑ Cold Temperatures; down to minus 40 C/ minus 40 F, do not effect the strength of the products.
- ❑ Missing or illegible capacity tag.

CHAIN SLINGS:

- ❑ Link by Link inspection for bent, stretched, cracks, or heat damage in any link.
- ❑ Check rings & hooks for distortion, cracks in weld area, corrosion, and scores or heat damage.
- ❑ Deformed master link or coupling links.
- ❑ Hooks with more than 15% greater than normal throat opening or more than 10 degrees twist from plane of unbent hook.
- ❑ Missing or non-functional hook safety latch.
- ❑ Missing or illegible capacity tag.

METAL MESH SLINGS:

- ❑ Broken weld or joint.
- ❑ Broken wire in any part of the mesh.
- ❑ Reduction in wire of 25% due to abrasion or 15% due to corrosion.
- ❑ Lack of flexibility due to distortion of the mesh.
- ❑ Any distortion or twisting of either end fitting.
- ❑ Cracked end fitting.
- ❑ Missing or illegible capacity tag.

IF ANY OF THE ABOVE CONDITIONS ARE NOTED THE EQUIPMENT MUST BE REMOVED FROM SERVICE. NOTIFY THE IMMEDIATE SUPERVISOR AND THE BNL HOISTING & RIGGING INSPECTOR (X-5456) TO DETERMINE IF EQUIPMENT IS SAFE FOR USE AND OK TO RETURN TO SERVICE.

A QUALIFIED INSPECTOR MUST MAKE DOCUMENTED INSPECTIONS AT LEAST ANNUALLY, HAVING RECORDS MAINTAINED BY THE CONGNIZANT EQUIPMENT SUPERVISOR.

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Attachment 4.3

BROOKHAVEN NATIONAL LABORATORY

Rigging Hardware
Inspection/Removal Criteria

Rigging hardware must be removed from service if damage such as the following is visible and must only be returned to service when approved by a qualified person.

a) **missing or illegible manufacturer's name or trademark and /or rated load identification.**
b) **indications of heat damage including weld spatter or arc strikes.**
c) **excessive pitting or corrosion.**
d) **bent, twisted, distorted, stretched, elongated, cracked or broken load-bearing components.**
e) **excessive nicks of gouges.**
f) **A 10% reduction of the original or catalog dimension at any point around the body or pins.**
g) **incomplete thread engagement.**
h) **excessive thread damage.**
i) **evidence of unauthorized modifications.**
j) **other conditions, including visible damage that cause doubt as to the continued use of the equipment.**
k) **for swivel hoist rings, lack of the ability to freely rotate or pivot.**
l) **for swivels, loose or missing nuts, bolts, cotter pins, snap rings or other fasteners and retaining devices.**

Also with the use of Compression Hardware (wire rope clamps) the following must be considered.

a) **insufficient number of wire rope clips.**
b) **improperly tightened wire rope clips.**
c) **indications of damaged wire rope.**
d) **indications of slippage of wire rope.**

Attachment 4.4

DAILY (Frequent)
OVERHEAD CRANE/HOIST INSPECTION CHECKLIST

Dept/Div:	Crane #:	Bldg #:	Date:
Operator Name:		Life #:	

- ☐ **Check BNL Periodic Inspection Tag**
  NOTE: If the tag is missing or the inspection due date has expired or is illegible, the equipment must be removed from service. Contact the BNL Hoisting and Rigging Inspector at ext. 5456 to schedule an inspection.
- ☐ **Locate Crane Main Disconnect Switch**
- ☐ **Check Pendant Controls or Controllers or Selector**
  (Up, Down, East, West, North and South)
- ☐ **Check Wire Rope or Chain for Damage** *Documented 30-Day inspection required (check rope/chain for worn, cut, kinked crushed, spooling, or birdcaged cable)
- ☐ **Check Hook** *Documented 30-Day Inspection required (Bent, spread, cracked, and safety latch)
- ☐ **Check Upper Limit Switch** (Hook block stop)
- ☐ **Check for Reverse Reeving** (Hoist cable direction)
- ☐ **Check Brake System** (Trolley, bridge, and hoist)
- ☐ **Check Trolley and Bridge Travel** (Make sure stops are in place and limits working Make sure travel path is clear of obstructions)
- ☐ **Check Hoist Gearing System** (Any unusual noises)
- ☐ **Check Rails During Operation** (Unusual wear or noise)
- ☐ **Check Lubrication** (Leaks, excess grease)
- ☐ **Review Weight Limits**
  (Weight to be lifted must be calculated or measured if unknown)
- ☐ **Inspect Rigging Equipment to be Utilized**
  (Slings, shackles, guide ropes, use personnel protection equipment)

CAUTION: IF ANY MALFUNCTIONS OR UNUSUAL NOISES ARE OBSERVED, STOP USING THE CRANE/HOIST AND CONTACT YOUR SUPERVISOR OR SAFETY COORDINATOR IMMEDIATELY

NOTE: PERSONNEL USING MATERIAL HANDLING EQUIPMENT MUST BE TRAINED AND QUALIFIED FOR THAT SPECIFIC TYPE OF EQUIPMENT

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Attachment 4.5

BROOKHAVEN NATIONAL LABORATORY

Overhead Crane Monthly Inspection Report

Manufacturer: _____ **Sn.** _____

Bldg. # _____ **Equip. #** _____ **Capacity**_____

1. Daily/Pre-Use Inspection Performed prior to start of monthly inspection.
2. Check BNL Inspection Tag for current inspection date if date has expired or tag is missing or is illegible Remove Equipment from Service
3. Lower Load Block to its lowest position (just above floor level).

Check for any condition that could result in an appreciable loss of strength (loose hardware, damaged hook, damaged chain or rope).

	Sat.	Unsat.	NA
Wire Rope:			
a) Check hoist rope, including end connection for significant wear, kinking, crushing, birdcaging, corrosion, or broken wires.	☐	☐	☐
Load Chain:			
b) Check hoist chain including end connection, for excessive wear, twist, distorted links interfering with proper operation.	☐	☐	☐
Load Hook:			
c) Check load hook for cracks, deformation, latch engagement, damage from chemicals or heat. Also check hook attachments and hardware.	☐	☐	☐

Comments: _____

_____

_____

Note:
Report any category resulting in an unsatisfactory condition to the Dept/Div. supervisor or the BNL Hoisting & Rigging Inspector (x: 5456).
(To determine whether they constitute a safety hazard and whether the crane should be removed from service).

Inspected By: _____ **Date:** _____

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Attachment 4.6

Electric (DC) Motor Forklift Pre-Start (Visual) Check Points				
#	Item	N/A	OK	S/R
01	**BNL Inspection Tag** (check insp. Due Date) if inspection due date has expired, or tag is missing, or illegible equipment must be LOTO and inspection scheduled			
02	Hour meter reading			
03	**Specification nameplate**			
04	Battery charge			
05	Battery condition and cap vents			
06	Battery connections			
07	**Hydraulic fluid level**			
08	**Hydraulic hoses**			
09	**Hydraulic lift and tilt cylinders**			
10	**Fluid leaks**			
11	**Wheels and tires**			
12	Chain and hose guards			
13	**Mast assembly and cap bolts**			
14	**Lift carriage and teeth**			
15	**Safety stops and latches**			
16	**Forks and latches**			
17	**Back rest**			
18	**Overhead guard**			
19	**Seat belt**			
20				
21				
22				
23				
Equipment Manufacturer		Equipment #		
Operator Name:			Date:	

Pre-operational check points on other side

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Attachment 4.6 (continued)

Electric (DC) Motor Forklift Pre-Operational Check Points				
#	Item	N/A	OK	S/R
01	**Neutral safety switch** (operating)			
02	**Horn** (audible)			
03	**Backup alarm** (audible)			
04	Headlights (functional and visible)			
05	Turn signal (functional and visible)			
06	Wiper(s) (functional and effective)			
07	Warning light (functional and visible)			
08	**Foot brake** (pedal holds/smooth stop)			
09	**Parking brake** (holds against acceleration)			
10	Directional controls (smooth operation)			
11	Motor noise (normal)			
12	**Emergency battery disconnect**			
13	**Dash gauges** (operating)			
14	**Steering/turning** (smooth operation)			
15	**Lift mechanism** (smooth operation)			
16	**Tilt mechanism** (smooth operation)			
17	Side shifter (smooth operation)			
18	**Fluid leaks** (under forklift or near hoses)			
19	**Wheel/tire revolution** (smooth & no bumps)			
20	**Dead-man seat brake**			
21				
22				
23				
24				
25				
N/A = Not Applicable; OK = Item in Working Condition; S/R = Service Required **Bold Items to be removed from service if S/R condition noted**				
Comments:				

Pre-start check points on other side

4.0/3b14e011.pdf 2 (11/2006)

Attachment 4.7

Internal Combustion Engine Forklift Pre-Start (Visual) Check Points				
#	Item	N/A	OK	S/R
01	**BNL Inspection Tag** (check insp. Due Date) if inspection due date has expired, or tag is missing, or illegible equipment must be LOTO and inspection scheduled			
02	Hour meter reading			
03	**Specification nameplate**			
04	**Engine**			
05	Battery and battery connections			
06	**Belts and hoses**			
07	**Engine oil level**			
08	**Coolant level**			
09	**Hydraulic fluid level**			
10	**Fluid leaks**			
11	**LPG cylinder bracket and locator pin**			
12	Fuel level			
13	Fuel cap and fuel splash screen			
14	**Wheels and tires**			
15	**Hydraulic lift and tilt cylinders and hoses**			
16	Chain and hose guards			
17	**Mast assembly and cap bolts**			
18	**Lift carriage and teeth**			
19	**Safety stops and latches**			
20	**Forks and latches**			
21	**Back rest**			
22	**Overhead guard**			
23	**Seat belt**			
Equipment Manufacturer		Equipment #		
Operator Name:			Date:	

Pre-operational check points on other side

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Attachment 4.7 (continued)

Internal Combustion Engine Forklift Pre-Operational Check Points				
#	Item	N/A	OK	Fix
01	**Neutral safety switch** (operating)			
02	**Horn** (audible)			
03	**Backup alarm** (audible)			
04	Headlights (functional and visible)			
05	Turn signal (functional and visible)			
06	Wiper(s) (functional and effective)			
07	Warning light (functional and visible)			
08	**Foot brake** (pedal holds/smooth stop)			
09	**Parking brake** (holds against acceleration)			
10	**Clutch, gear shift & directional controls**			
11	**Engine noise** (normal)			
12	Dash gauges (operating)			
13	**Steering/turning** (smooth operation)			
14	**Lift mechanism** (smooth operation)			
15	**Tilt mechanism** (smooth operation)			
16	Side shifter (smooth operation)			
17	**Fluid leaks** (under forklift or near hoses)			
18	**Wheel/tire revolution** (smooth & no bumps)			
19	Exhaust (functional and effective)			
20	**Smoke, fumes, odors, vapors** (normal)			
21				
22				
23				
24				
25				
N/A = Not Applicable; O/K = Item in Working Condition; S/R = Service Required **Bold items to be removed from service if S/R Condition Noted**				
Comments:				

Pre-start check points on other side

4.0/3b15e011.pdf 2 (11/2006)

Attachment 4.8

Appendix E: Frequent Inspection Guide for Aerial Lifts

Frequent Inspection Guide for Aerial Lifts (Daily or Before Each Use)	
Equipment:	Location:
Operator:	Date:

Instructions:

(1) Use this guide for frequent inspections (before, during, and after operation) of BNL aerial lifts.

(2) This guide can be used to document safety deficiencies found during the inspections.

(3) Operator must be qualified to operate equipment and have a current BNL *Safety Awareness Certificate (SAC Card)*.

(4) Safety harness or body belt must be WORN during operations

(5) If any malfunction or unusual noises occurs, STOP using the equipment and CONTACT SUPERVISOR IMMEDIATELY

AERIAL LIFT GENERAL APPEARANCE	load rating chart; proper placarding of controls; working gauges; operators manual; guard rails; gates; frame rails for weldment breaks; cut or worn tires; structural damage to equipment
AERIAL LIFT CARRIER	all fluid levels in engine; transmission; radiator; belts; batteries; electrical system; caster swivel wheel assemblies
CARRIER DRIVE TRAIN	front and rear axles for leaks; springs; brake system; steering system; positive lock on brake
OUTRIGGER	hydraulic leaks; floats; pins and keepers; holding valves; upper and lower operating controls
HYDRAULIC BOOM	leaks; boom travel; hinge pins; wear/roller pads; hydraulic hose reel and boom for cracks
LATTICE FRAME	frame lacing; structure; limit switches; stops
WIRE ROPE AND SHEAVES	sheaves; hoist rope; swivels; rope reeving; rope anchoring
PLATFORM FALLING CHAINS	chain condition; sprockets; brakes
BOOM HOIST	hydraulic leaks; wire rope ends; rope anchoring; brakes; clutches; controls
COUNTER WEIGHT	mounting bolts
SAFETY ITEMS	back-up alarms; level indicator; load indicator; load charts; all lights; horn

Safety Hazard Deficiencies (or other comments): .....

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