"How to Move the Central Detector between the CDF Assembly Hall and the CDF Collision Hall"

This procedure outlines the steps to be used to move the CDF Colliding Detector between the CDF Assembly Hall and the CDF Collision Hall.

Due to the weight and cost of the Colliding Detector, it is required that the head of the Research Division review and approve this moving procedure.

Approvals:

_____ _____
(Safety Committee Head) (Date)

_____ _____
(CDF Department Head) (Date)

_____ _____
(Research Division Head) (Date)

_____ _____
(Accelerator Division Head) (Date)

1.0 Controlled Copies of this procedure.

Two controlled copies of this procedure will exist.

One will be held in the CDF Department Office.

One will be held in the CDF (B-0) Office Complex, Room 171i.

All other copies will be marked, " **INFORMATIONAL COPY ONLY** "

2.0 The Procedure.

STEP 1: Identify Key Personnel and their Responsibilities and Minimum Personnel Requirements

2.0.1: Objective: To identify the responsibilities of each individual involved in the movement of the CDF Colliding Detector.

2.0.2 Responsibilities:

a). **Qualified Instructor:** is a person with rigging experience and designated by CDF. May be called upon to instruct people in this procedure. May be called upon to serve any function in the procedure.

b). **Co-Ordinator:** will oversee the movement operation from a distance great enough to easily see all personnel and equipment involved in the move and to watch for over-head obstructions. He will report any developing or potential problems to the Task Leader. At no time will the Co-Ordinator take over for the task leader. The Co-Ordinator is there to assist and insure that overall safety is being maintained.

c). **Responsible Engineer:** may be called on to function as the task leader. May also be called upon to solve structural / mechanical problems such as: how to move obstacles or how to cross gaps in the floor. Will be a structural or mechanical engineer designated by CDF.

d). **Task Leader:** will insure that all personnel under his / her direction have performed their checks of the equipment and will insure that the equipment is installed properly. He / she will make certain that his / her personnel are located in their designated areas before the move begins. He / she will specify who will operate the equipment such as the Unified Jacking System. He / she will move freely in the work area to insure that the movement of the CDF Colliding Detector is completely controlled. His / her directions will be followed completely and therefore he / she becomes responsible for the safety of the personnel and equipment involved during the move. **NO** movement of the CDF Colliding Detector will be conducted without his / her presence.

e). **Workers:** will install all equipment and will insure that the equipment is serviceable and free from defects. They will move hydraulic push / pull cylinders as necessary. They will keep the area clean and free from obstructions and will follow all directions from the task leader.

f). **Unified Jacking System Pump Operator:** will be designated by the task leader and will be qualified to operate the equipment used to lift or lower, and push or pull the CDF Colliding Detector. He / she will follow all directions from the task leader.

g). **Forklift Operator:** will be designated by the task leader and will be qualified to operate the forklift truck. He / she will follow all directions from the task leader.

2.0.3 Minimum personnel requirements for moving CDF Colliding Detector.

a). Task Leader, Responsible Engineer or Qualified Instructor (1 required)

b). Co-Ordinator (1 required)

c). Forklift Operator and Unified Jacking System Pump Operator (should be the same person, if qualified for both functions) (1 required)

d). Push / Pull Cylinder Movers -- need not be trained, but must follow directions of task leader (4 required)

e). Cable Carrier Alignment -- (2 required)

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f). Cable Carrier Watcher -- (1 required)

g). Back side of Colliding Detector Watcher -- (1 required)

h). Total minimum personnel requirement is ten (11).

2.1 Operating Procedure for Moving CDF Colliding Detector.

The following procedures for moving the CDF Colliding Detector will be followed with the strictest adherence to each step and will be verified by the task leader. A completed checklist (Section 3.0) must be completed and filed with Bob Shovan, CDF Office Complex, Office 171i for each move of the CDF Colliding Detector.

STEP 2: Area Preparation

CAUTION! Rolling the CDF Colliding Detector over loose debris could cause the Hillman Rollers to bind or stop suddenly. This could cause damage to the Hillman Rollers.

2.1.1 Objective: To provide a safe working environment for the safety of the personnel as well as the CDF Colliding Detector.

2.1.2 Procedure: The track on which the CDF Colliding Detector will be moved, will have all obstacles moved clear of the area and will have the area around them completely clear of debris. During the move, the workers will continuously verify that no objects are lying in the movement area of the Hillman Rollers.

STEP 3: Key Equipment / Inspection of Equipment:

2.1.3 Objective: To maintain proper performance of equipment for serviceability and safety.

2.1.4 Equipment:

a). Unified Hydraulic Jacking System: will be inspected for leaks, cracks or other defects. All surfaces will be cleared of debris. The task leader will designate, from the list of trained people, who will check and operate the equipment.

b). Hillman Rollers: will be free from defects and will roll freely.

c). Push / Pull Hydraulic Cylinders: will be inspected for leaks, cracks or other defects.

d). Forklift Truck: will be inspected for leaks, cracks or other defects. The task leader will designate, from the list of trained people, who will check and operate this equipment.

STEP 4: Placement of Equipment / Personnel

NOTE! While conducting the move, all directions will be given **ONLY** by the task leader.

2.1.5 Personnel:

a). The Task Leader is free to move around the work area to supervise and give instructions.

b). The Co-Ordinator is free to move around the area and will oversee the movement operation from a distance great enough to easily see all personnel and equipment involved in the move and to watch for obstructions. He will report any developing or potential problems to the task leader.

c). The Forklift Operator is free to move around the work area as required.

d). The Unified Hydraulic Jacking System Operator should always be in eye or voice with the task leader.

e). The push / pull cylinder movers will be positioned so that they can identify problems with the hydraulic push / pull cylinders. They will reposition the hydraulic push / pull cylinders as necessary.

f). The Cable Carrier Alignment Personnel will be positioned on each side of the cable carrier,

NOTE: ***Use either 2.2 "Moving the CDF Colliding Detector into the CDF Collision Hall," or 2.3 "Moving the CDF Colliding Detector out of the CDF Collision Hall."***

2.2 Moving the CDF Colliding Detector into the CDF Collision Hall.

2.2.1 Objective: To reposition the CDF Colliding Detector in a slow (about 1 foot per minute), controlled manner so that safety to personnel and equipment is maintained.

STEP 5: Points to check before beginning the CDF Colliding Detector move

2.2.3 Objective: To insure that the CDF Colliding Detector is ready to move.

WARNING! These items **MUST** be checked and confirmed before any movement operation is performed on the Colliding Detector.

2.2.3 Complete Checklist under 3.1. Return completed "Check List," to Bob Shovan in CDF (B-0) Office Complex (Room 171i).

STEP 6:

2.3 Moving the CDF Colliding Detector out of the CDF Collision Hall.

2.3.1 Objective: To reposition the Colliding Detector in a slow (about 1 foot per minute), controlled manner so that safety to personnel and equipment is maintained.

STEP 5: Points to check before beginning the CDF Colliding Detector move

2.3.3 Objective: To insure that the CDF Colliding Detector is ready to move.

WARNING! These items **MUST** be checked and confirmed before any movement operation is performed on the Colliding Detector.

2.3.4 Complete Checklist under 3.2. Return completed "Check List," to Bob Shovan in CDF (B-0) Office Complex (Room 171i).

STEP 6:

3.0 Checklist

3.1.1 Moving the CDF Colliding Detector into the CDF Collision Hall

3.1.2 Person completing Checklist _____ Date _____

3.1.3 Return completed check list to Bob Shovan in CDF (B-0) Office Complex, Room 171i.

3.1.4 The following **Must** be checked and confirmed before any moving operation is performed.

confirm that cryogenic lines are disconnected and capped (Cryogenic Department)

confirm that radiation monitors are disconnected

confirm that interlock cables are disconnected

remove panels in front of push / pull point

confirm that beam pipe to Low Beta Quads (2) has been removed

confirm that closure between detector and 710 floor is removed

confirm that north wall support platform is removed

confirm that jumper plates between detector and south wall support platform are removed

confirm that (2) north CMEX's are moved to Assembly hall

confirm that (2) south CMEX's are moved away from detector

3.2.1 Moving the CDF Central Detector out of the CDF Collision Hall

3.2.2 Person completing Checklist _____ Date _____

3.2.3 Return completed check list to Rigging Co-Ordinator in CDF (B-0) Office Complex, Room 171i.

3.2.4 The following **Must** be checked and confirmed before any moving operation is performed.

_____ Confirm that all cryogenic lines are disconnected, capped and stored away from Central Detector capped (RD / Cryogenic Department)

_____ Confirm that all house power and ground cables are removed and stored away from the Central Detector (CDF / Electrical Department)

_____ Confirm that all communication cables are disconnected and stored (CDF / Electrical Department)

_____ Confirm that Cable Carrier has been cleaned and prepared for move (CDF / Electrical Department)

_____ Confirm that all Pit Steel Chamber cables are disconnected (CDF / Electrical Department)

_____ Confirm that all North and South Return Iron Chamber cables are disconnected (CDF / Electrical Department)

_____ Confirm that top cable carrier covers are removed and stored (CDF Electrical Department)

_____ Confirm that bottom and top scintillator paddles are removed and stored

_____ Confirm that all flammable gas lines are purged, disconnected and stored (CDF / Gas Group Leader)

_____ Confirm that all Pit Steel Chamber gases are purged, disconnected and stored (CDF / Gas Group Leader)

_____ Confirm that all North and South Return Iron Chamber gases are purged, disconnected and stored (CDF / Gas Group Leader)

_____ Confirm that all cooling systems are drained, disconnected and stored (CDF / Mechanical Group)

_____ Confirm that all Halon piping is disconnected and removed under detector (CDF / Mechanical Group)

_____ Confirm that VESDA on the Central Detector has been bypassed, disconnected and stored (CDF Mechanical Department)

_____ Confirm that all Solenoid Power cables are disconnected and stored away from Central Detector (RD / Electrical Department)

_____ Confirm that all attached catwalks are removed and stored away from Central Detector (Rigging Co- Ordinator)

_____ Confirm that all floor closures are removed and stored away from Central Detector (Rigging Co- Ordinator)

_____ Confirm that (2) North CMEX are removed from Collision Hall (Rigging Co-Ordinator)

_____ Confirm that (2) South CMEX are moved away from Central Detector (Rigging Co-Ordinator)

_____ Confirm that South Muon Wall is moved to south away from Central Detector (Rigging Co-Ordinator)

_____ Confirm that jumper plates between Central Detector and South Muon Wall, Lower Muon Steel are removed (Rigging Co-Ordinator)

_____ Confirm that Beam Pipe between Colliding Detector and Low Beta Quads has been removed (Rigging Co-Ordinator)

_____ Confirm that all Central Detector shim packs are tied to detector, so that they move with detector (Rigging Co-Ordinator)

_____ Confirm that all (4) plug rail extensions are rotated fully toward Central Detector and that the bolts have been removed (Rigging Co-Ordinator)

_____ Confirm that the Bridge Ladder has been removed (Rigging Co-Ordinator)

_____ Confirm that Cable Carrier Pins have been rotated and checked for free movement (Rigging Co-Ordinator)

_____ Confirm that the floor under Central Detector has is clean and clear of all debris (Rigging Co-Ordinator)

_____ Confirm that Hillman Rollers have been checked for rotation, oiled and checked for cylinder hose clearance (Rigging Co-Ordinator)

4.0 Deviations from the Procedure

Must be approved by Responsible Engineer or Qualified Instructor.

5.0 Required Training and Authorized Training Personnel.

5.0.1 To be an Authorized Instructor, the person must have several years experience in the rigging field. The person must be designated by the Responsible Engineer.

5.0.2 When an Authorized Instructor is present, the operation may declared to be a training session. No previous training is required by the other members of the team.

5.0.3 To be a Responsible Engineer , the person must have several years experience as a Structural or Mechanical Engineer. The person must be designated by the CDF Department.

5.0.4 To be a Co-Ordinator, the individual must have a number of years of experience in the rigging field or have been trained by the "Authorized Instructors," in this procedure. The qualifications of this individual are evaluated by the Responsible Engineer or Authorized Instructor.

5.0.5 To be a Task Leader, the individual must have a number of years of experience in the rigging field and be trained by the "Authorized Instructor," in the procedure. The qualifications of this individual are evaluated by the Responsible Engineer and / or Authorized Instructor.

5.0.6 To be a Unified Jacking System Operator, the person is expected to know how to identify problems in operating the system (such as leaks and damaged parts), how to implement the system and how to handle failures. He will demonstrate his ability to the "Authorized Instructor," before being designated as a Hydraulic Pump Operator.

5.0.7 To be a Forklift Truck Operator, the person is expected to know how to identify problems in operating the Forklift Truck (such as leaks and damaged parts), how to implement the system and how to handle failures. He will demonstrate his ability to the "Authorized Instructor," before being designated as a Forklift Truck Operator.

LIST OF RESPONSIBLE ENGINEERS FOR THIS PROCEDURE

Name GRIMSON, JOHN ID # 330 .
Last, First

Name CARTER, HARRY ID # 3236 .
Last, First

Name ID # .
Last, First

Name ID # .
Last, First

Name ID # .
Last, First

Name ID # .
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Name ID # .
Last, First

Name ID # .
Last, First

Name _____ ID # _____.
Last, First

LIST OF AUTHORIZED INSTRUCTORS FOR THIS PROCEDURE

Name GRIMSON, JOHN ID # 330 .
Last, First

Name SHOVAN, ROBERT ID # 851 .
Last, First

Name _____ ID # _____.
Last, First

Name _____ ID # _____.
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Name ID # .
Last, First

6.0 Training Materials.

None at this time.

7.0 List of Trained People for this procedure.

The most current copy of this training list must be kept with the controlled copies of this movement procedure. The controlled copies are maintained in the CDF Department Office and the CDF (B-0) Office Complex, Room 171i. If the trained individual's name is not on the controlled copy list, then that individual is NOT authorized to do the specified function.

7.1 Task Leader:

_____.
name, ID# date expires

signature: _____. approved by: _____.

_____.
name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

7.2 Unified Jacking system Pump Operator:

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

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name, ID# date expires

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name, ID# date expires

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name, ID# date expires

signature: _____. approved by: _____.

7.3 Unified Jacking system Pump Operator:

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

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name, ID# date expires

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name, ID# date expires

signature: _____. approved by: _____.

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name, ID# date expires

signature: _____. approved by: _____.

8.0 References and Supporting Documentation.

None at this time.