Lawrence Berkeley Laboratory – University of California Engineering Note	Code SR0209	Serial M7650	STAR doc # SN 0309	Page 1 of 3
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Program

Solenoidal Tracker at RHIC (STAR)

Subprogram

Time Projection Chamber - Transportation - Shippping

Title

TPC Lifting Procedure for Truck Loading at Bld. 77A

Person in Charge : _____ Date _____
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Introduction
The following note is written to satisfy the requirements of a High Consequence/ High Value Lift, as delineated by Chapter 5, Part 4 of PUB 3000. The replacement cost of the STAR TPC is estimated at $6 M. Damage to this item would have a significant impact on the STAR Detector schedule.

Item: STAR Time Projection Chamber (12,200 lb.) with support frame, including extensions and spacers (7150 lb.).

Lifting Equipment (below hook): TPC Lifting Fixture SPR-008-77A (3300 lb.)

Total hook load: 22,650 lb.

Center of gravity: TPC and support fixture C.G. is located at the mid-length and mid-width and 26 inches below the vertical center of the TPC.

Step Wise Procedure:

1. Bolt the shipping support extension and lifting fixture spacers (LBL Dwg 21F0442A and 21F0404A, respectively) to the shipping support frame. Refer to Engineering Note M7649/STAR Note 308). Torque all bolts to 150 ft.-lb.

2. Bolt on the lifting ears from the TPC lifting fixture (SPR-008-77A), (LBL Dwg 24A6293A) to the top of the shipping support extensions. Torque the bolts to 120 ft.-lb.

3. Hanging the main cross member from the portable crane, pre-assemble the TPC Lifting fixture's turnbuckles(4 ea.) and lifting beams (2 ea.) and dynamometers (4 ea.) Refer to Engineering Note M7548/STAR Note 209 for details.

4. Roll the TPC out of Bld. 77A west roll-up door to the end of the rails (fully clear of the building).

5. Using the portable crane, position the lifting fixture in line with the ears already in place on the support structure. Couple the fixture to the frame via the dynamometer's pins. Secure the keeper nut and cotter pins.

6. Slowly lift the load making sure that the dynamometer links are free to pivot. With no more than 2500 lb. on any corner compare the weight on each corner. If the corners are not balanced within 500 lb., lower to remove the load and adjust the turnbuckles to balance the readings. Lift again to 2500 lb. maximum on a corner and recheck.

7. With the turnbuckles adjusted, lift the TPC while monitoring the dynamometers. One person should be stationed at each corner. Loading should be incremental with stops at every 1000 lb./ corner. If a imbalance of more than 1000 lb. occurs, stop the lift, re-adjust the turnbuckles and try again.

8. With the load suspended from the crane, slowly raise the TPC until the bottom clears the truck bed and swing it into position over the truck. Slowly lower the load while keeping the TPC centered on the truck bed between the front and back bumpers and side to side braces.