

CDF Detector Decommissioning Plan

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Fermilab

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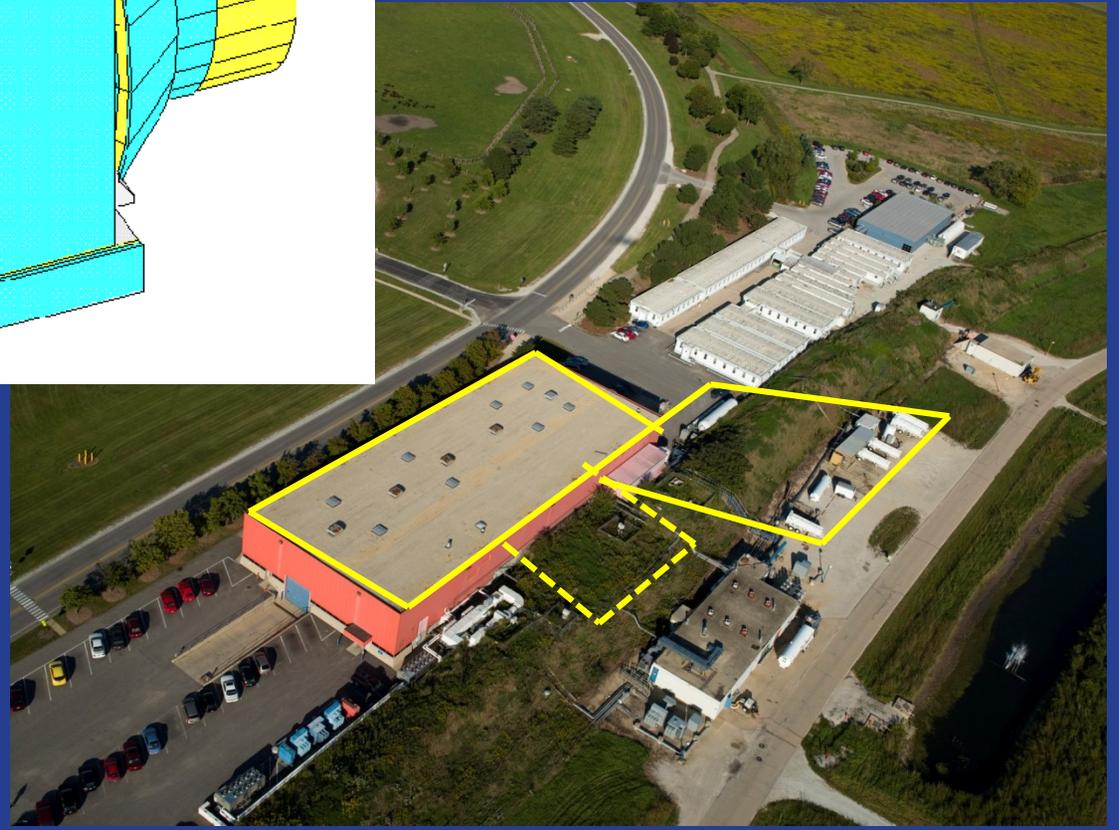
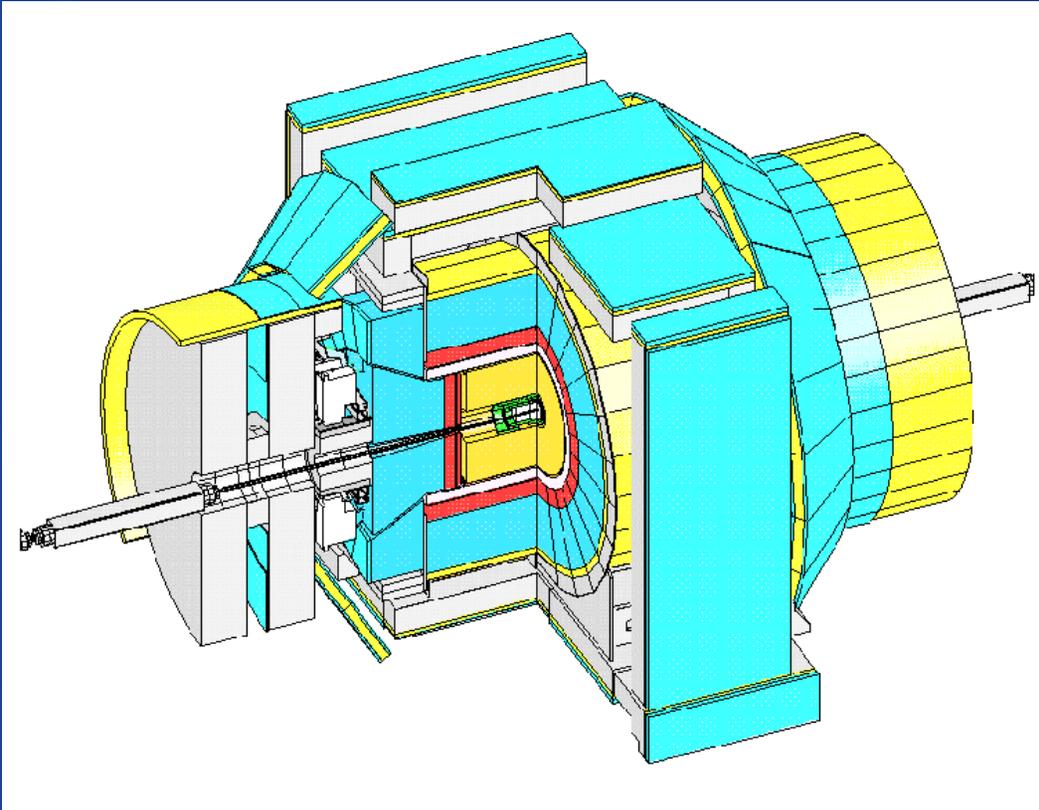
Scope

- Remove CDF Detector
 - Central detector
 - Muon shielding and detectors
 - Cable bridge
 - 4500 t steel, 110t lead
- Remove All Electronics
 - 100 9U VME crates, power supplies, etc.
- Remove Most Process Systems

Phase 0: Secure Facility

- Remove radioactive sources
- Inert gas volumes
 - Open to air
- Lock out experimental power
- Drain cooling systems
 - Open to air
- Grease rollers
- Secure lifting fixtures
- Configure HVAC for office-quality environment
- Scavenge immediately useful equipment
- Dismantle tech areas in west high-bay
 - Need floor space for later work
 - Not yet costed

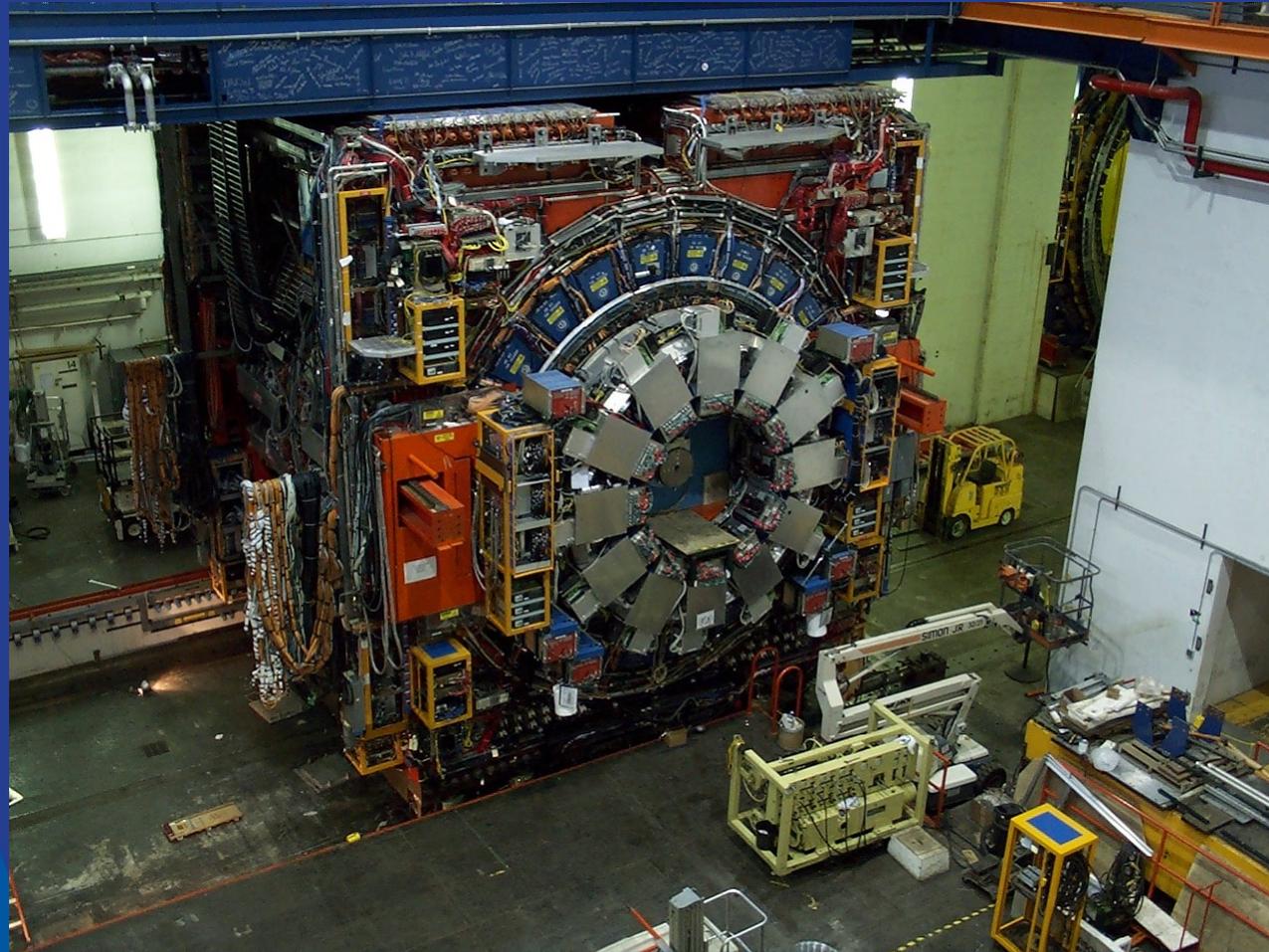
Scope



Phase 0: Secure Facilities

- Work not on Project
 - Closeout of operations
- Six weeks to complete

Phase 1: Roll Out and Strip



Phase 1: Electronics and Process Systems

- Electronics
 - Scrap
 - All custom electronics
 - Most online computers
 - All cables
 - Save
 - Core online computers (DB, webserver, etc.) to Feynman Center
 - Commercial NIM, Camac electronics and HV
 - Crate CPUs and VME crates if requested
 - Level 3 trigger computers (to MIT for CDF data analysis farm)
 - Counting room racks
 - Scope
 - Counting rooms will be emptied and false floor filled in
 - Leave cooling water headers and power at breaker panels
 - Third floor is poor quality as counting room. Probably should be stripped.
 - Roll out detector and strip

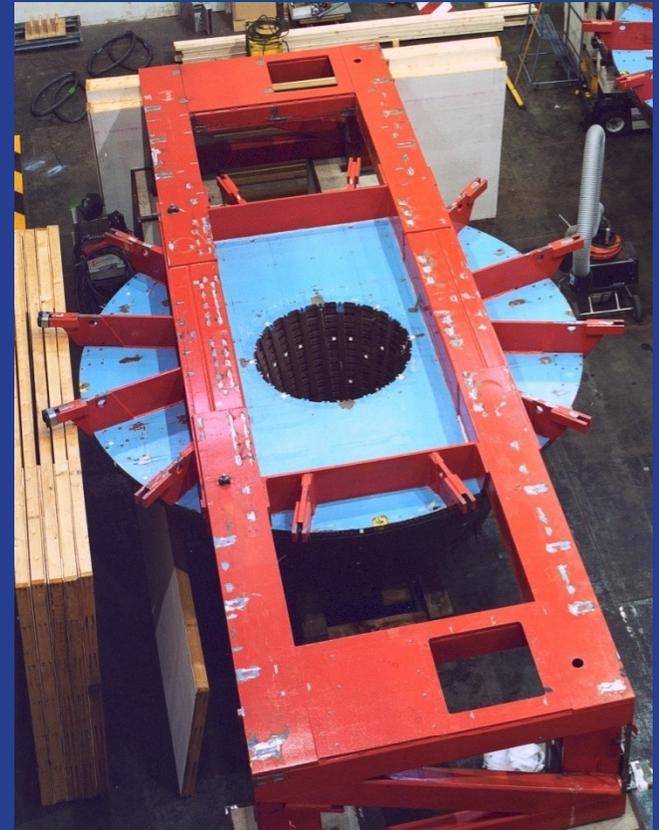
Phase 1: Electronics and Process Systems

- Process Systems
 - Scrap
 - . Gas systems
 - . Drift Chamber, Silicon Cooling Systems
 - . Solenoid Controls
 - . Motor Generators
 - Unless customer for 400 Hz power is identified
 - Save
 - . Cryo plant
 - . Electronics Cooling
 - . HVAC
 - . Test solenoid (warm)
 - . Valuable gas or cooling system components
 - . Unused fittings, etc.

Phase 1: Electronics and Process Systems

- Cost and Schedule
 - One year
 - 15 techs
 - \$3.6M Labor
 - \$0.6M M&S
 - Disposal costs
 - All costs fully loaded

Phase 2: Calorimeters and Muon Chambers



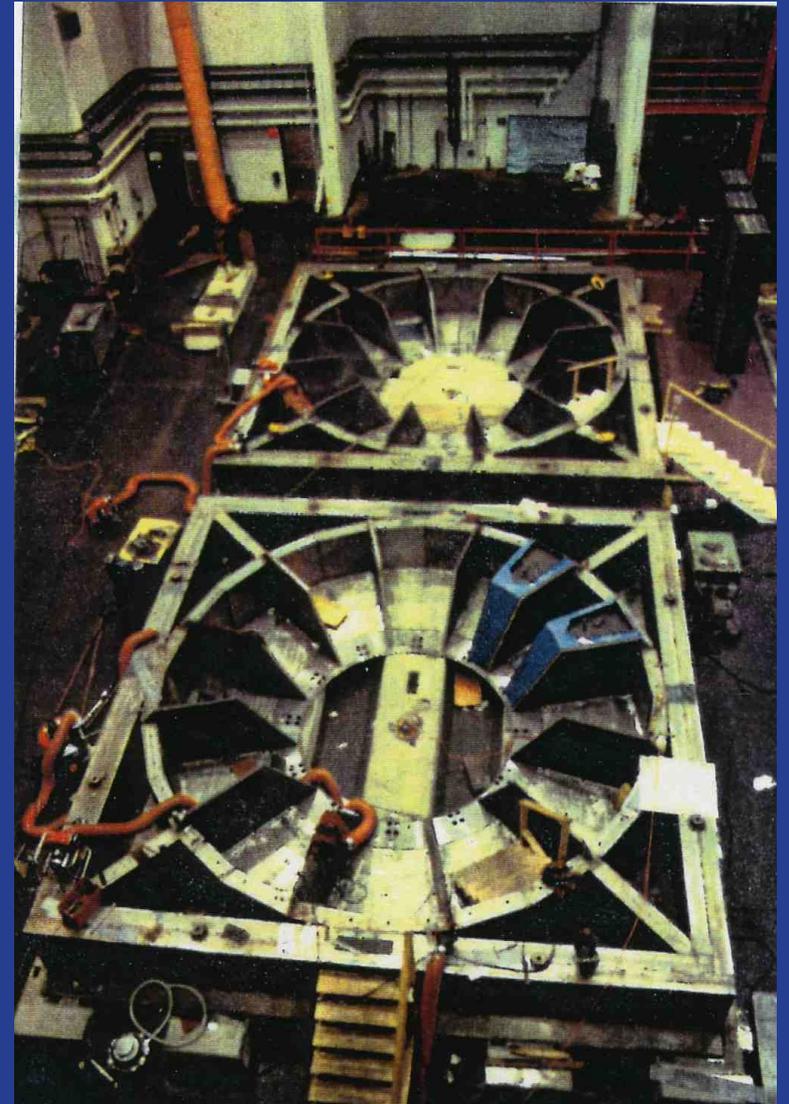
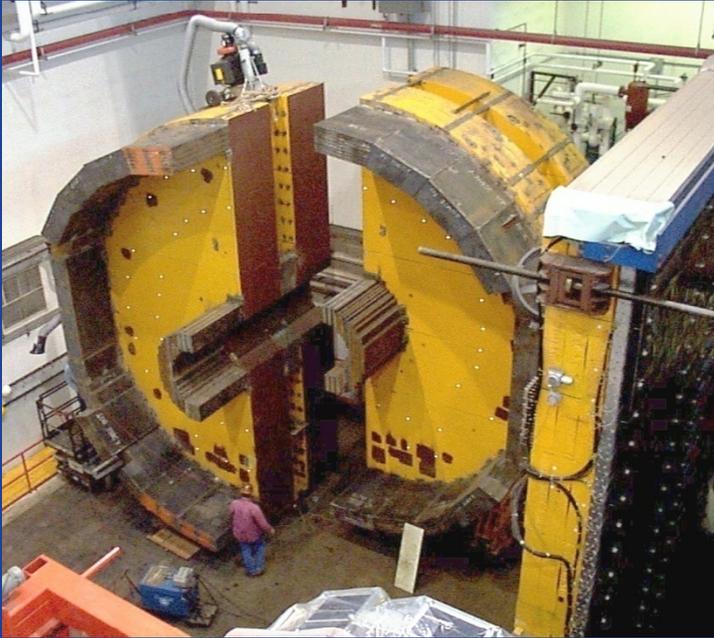
Phase 2: Calorimeters and Muon Chambers

- Disassemble CMX (muon) arches
- Dismount CMP and BMU muon chambers
- Unstack Central Calorimeter arches and strip down wedges
- Remove and rotate plugs
 - Strip scintillator
- Remove and strip Endwall Calorimeter Modules

Phase 2: Calorimeters and Muon Walls

- Cost and Schedule
 - One year
 - Two crews of iron workers
 - Costed as T&M: \$6.6M
 - Two techs, ES&H, support
 - Labor: \$0.5M
 - Disposal
 - M&S: \$4.4M

Phase 3: Central Detector



Phase 3: Central Detector

- Dismantle:
 - Cable bridge
 - Toroids and CMP walls
 - Plugs
 - Central detector
- Cost and Schedule
 - One year
 - Two crews of iron workers: \$6.6M
 - Two techs, ES&H, support: \$0.5M Labor
 - Disposal: \$1.7M M&S

Planning

- So far, have a top-down plan with rough estimates
 - General discussions with various knowledgeable techs and engineers
 - John Grimson
 - retired, lead engineer for constructions in the 1980s
 - Harry Carter
 - engineer for Run II construction
 - Dave Erikson
 - Welding expert
 - Dervin Allen
 - CDF lead tech
 - Eric McHugh
 - ES&H
 - Working on bottoms-up resource-loaded schedule
 - Requires significant engineering for Phase 3
 - Expect to identify areas overlooked in top-down estimate

Cost and Schedule Outline

- Approximately one year for each of the three phases
 - Phase 1 needs ~15 Fermilab techs full time
 - Phase 2&3 should be done with fixed-price contracts with rigging firms
 - Costed based on T&M rates
- Disposal of “Group 2” materials assumed to go to rad-waste facilities
 - Labor is still cost driver
 - Large steel blocks will probably go to the railhead

Cost Summary

Item	M\$
TOTAL DIRECT LABOR COST	7.4
TOTAL DIRECT M&S COST	2.9
TOTAL CONTINGENCY	7.4
TOTAL OH	8.6
GRAND TOTAL	26.2

- Using T&M for what will be fixed-price contracts

Issues: Timing

- Most work can be stretched out
 - Individual areas or systems make bite-sized chunks that can be done by lab techs as available
 - Central detector is one big job
 - Twice as long with one crew
- Stretching out D&D means building is not available for other purposes
 - Could leave detector in collision hall
 - Need to roll out to dismantle cable bridge
 - The longer it sits, the stiffer it gets
 - Full pit access when gone

Knowledge

- Mothballing is not an option
 - Cannot revive without intact collaboration
- The longer we wait to dismantle, access to the builders diminishes
 - The job gets harder
- Do we need activation studies?
 - Suggested by SLAC planning docs
 - Requires detector experts, Monte Carlo, etc.

Ownership

- No Significant Claims
 - Have canvassed collaboration
 - Nobody wants detectors or electronics back
 - Some interest in souvenirs or display pieces
- Value Recovery
 - Identified items of possible future use
 - No proposal process yet
 - Already the vultures are circling
 - JLab wants PMTs, solenoid
- Museum Pieces
 - Starting work with Education office
 - Move CDF museum area to new location
 - Offer items to science and technology museums

Space

- Where do we store all of the stuff we recover?
 - Electronics, Gas fittings, racks, phototubes, etc.
 - How do we publicize availability?
- Where do we store the stuff for disposal while we wait for resolution of the Metals Moratorium?
 - 4500 tons of steel and 46 full VME crates with power supplies

P996: Reuse Potential

- Proposed Kaon experiment
 - Tevatron as stretcher or transfer line from MI
 - CDF magnet and other infrastructure reused
 - Third generation experiment follow on to NA48
 - Proposed to PAC in November 2009
- Guess that 75% of Phase 1&2 work required
 - Save plug and endwall calorimeters
 - Save much of experimental services
 - Still much to dismantle
 - Need RLS to know full extent
- Muon systems, central calorimeter arches, and cable bridge must be removed
- Guess 18-24 months of D&D before P996 work can start

Project Staff (in formation)

- Project Manager: Jonathan Lewis
- Project Engineer: Del Allspach
 - temporary assignment
- L2 Managers
 - Calorimeters: Steve Hahn
 - Counting rooms: Jonathan Lewis
 - Tracking Detectors: TBD
 - Muons: TBD
 - Facilities (incl. Central Detector): project engineer
- Safety Coordinator: Dee Hahn
- Scheduler: Rich Krull

Summary

- Work begun on D&D Planning
- Schedule outlined
 - First year can be completed with army of techs without special training
- Initial cost estimate \$26M
 - Very rough even with 100% contingency included
 - Expect it to go up

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