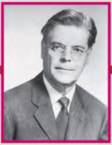

R. R. Wilson, Founding Director

L. Lederman, 2nd Director

March 1971

R.R. Wilson annouces intention to request authorization to build the Energy Doubler/Saver

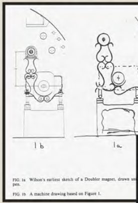
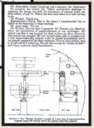
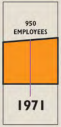


FIG. 1a Wilson's earliest sketch of a Doubler magnet, drawn us
pen.

FIG. 1b A machine drawing based on Figure 1.

Wilson's earliest sketch of a Doubler Magnet

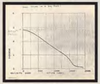

Congressional Hearings of 1971



January 1973

A superconducting magnet R&D program established at Fermilab.

June 1976


First stored beam in the Main Ring

> "Our electrical bill is over $7 million and would be over $10 million if we ran as much as we could, were there not economic restrictions. If we could replace the copper wire by the superconductive wire that is now becoming practical, we should be able to save as much as $5 million per year of electrical energy that is now being lost...."
>
> *R. R. Wilson, Congressional Hearings, 1977*

July 5, 1979

DOE authorization of the Tevatron project

SHUTDOWN 6.15.81 — 12.6.81

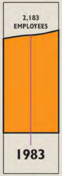
Installation of Energy Saver

SHUTDOWN 6.21.82 — 3.11.83

CDF construction and completion of the installation of Energy Saver

March 18, 1983

Installation of the last of 774 superconducting dipole magnets in the Tevatron



May 29, 1983

All magnets cooled to below 5° Kelvin by the largest cryogenic system in the world

Toasting the Tevatron helium transfer line

Changing a Kautzky valve

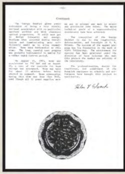
July 3, 1983

Tevatron achieves world-record proton beam energy of 512 GeV

August 15, 1983

Beam accelerated to 700 GeV

H. Edwards, 1983 Annual Report



Ground br

August 16, 1983

reaking for Pbar source enclosure

February 1984

Installation at CDF of warm iron low beta quadrupoles

SHUTDOWN 2.17.84 — 3.11.84

Modified Main Ring electrical and radiation safety system for collider operations

April 28, 1984

Dedication of the Energy Saver

Dedication Program, Ramsey Auditorium

SHUTDOWN 7.16.84 —12.07.84

Installed transfer line from Booster to Pbar source

Installation of Vacuum chambers into the large quadrupoles

April 8, 1985

Last magnet installed in Accumulator

April 21,1985

8 GeV proton beam injected at Debuncher and observed to complete one revolution of the ring for the first time

View of AP10 Control Room

June 27, 1985

TeV I target station is ready for pbar production

September 6, 1985

First pbars stacked

September 13, 1985

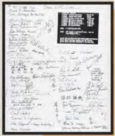
Start of Collider Engineering Run

October 11, 1985

Dedication of the Tevatron

October 13, 1985

1st observation of pbar-p collisions by CDF at 1.6 TeV



SHUTDOWN 10.14.85 — 2.01.87

B0 overpass & D0 collision hall construction

Tevatron dipole repair

May 1986

Tevatron named one of the Top Ten Engineering Achievements of the last 100 years

1986: Construction of B0-overpass & D0 Experimental Hall

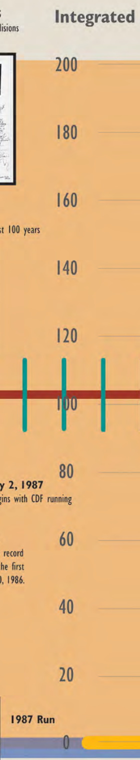
October 21, 1986

Acceleration of protons to a new record energy of 900 GeV. CDF records the first 1.8 TeV collisions on November 30, 1986.

FEB 1987

February 2, 1987

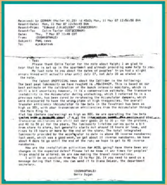
0th collider run begins with CDF running



Luminosity (pb^{-1})

Stochastic cooling upgrades in the Accumulator in progress

May 11, 1987
G. Dugan on luminosity



Received: by CERNVM (Mailer X1.23) id 4563; Mon, 11 May 87 12:56:58 GVA
Resent-Date: Mon, 11 May 87 12:56:45 GVA
Resent-From: "Edmond J.N.WILSON" <EJN@CERNVM>
Resent-To: Colin Taylor <CST@CERNVM>
Date: Thu, 7 May 87 11:48 CDT
From: <DUGAN@FNALE>
Subject: FNAL news
To: ejn@cernvm

Original

Ted:

Please thank Colin Taylor for the note about Ralph; I am glad to hear that he is set up in the apartment and already providing some help to you.

My last note to you about the dates of peoples' trips had a slight error: Vinod will actually stay until July 27, not July 30 as stated in the note.

The latest UNOFFICIAL news about the Collider is the following: The best peak luminosity we have reached is .98x10**29. This is based on our best estimate of the calibration of the bunch intensity monitors, which is still a bit uncertain; however, it is a conservative estimate. The transverse instability in the Accumulator during unstacking, which I referred to in a previous note, has been cured by re-phasing the Accumulator dampers, which were discovered to have the wrong phase at high frequencies. The overall transfer efficiency (Accumulator to low beta in the Tevatron) has been as high as 35%, with pbar transmission efficiencies from the Accumulator through the Main Ring to flat top (before coalescing) as high as 80%. We are operating the low beta system with a beta* of about .7 m at the interaction point. The proton and pbar transverse emittances are still not very good: 20 to 30 pi for the protons, and 40 to 50 pi for the pbars. The luminosity lifetime varies quite a bit from store to store, but generally starts out around 10 hours or less, and rises to 15 hours or more by the end of the store. The total integrated luminosity provided by the accelerator to date is above 35 inverse nanobarns; last week, which was a good week, we got about 10 inverse nanobarns. We have about 4 days to go until the end of the run; we hope to get to 40 inverse nanobarns.

How are the installation activities for ACOL going? Have there been any changes in the expected dates? Please let me know if any times for peoples' trips should be altered. We are now making the travel reservations.

I will be on vacation from May 13 to May 26. If you need to send us a message during that time, you can send it to Diana DeLeon, the department secretary.

<DUGAN@FNALE>
Gerry Dugan

June 20, 1988
First Collider run begins with CDF taking data

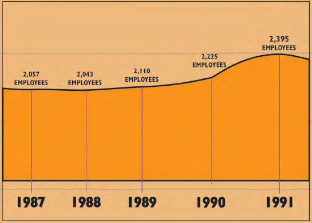
SHUTDOWN 6.01.89 — 2.11.90
Installed separators, replaced the Main Ring controls system and completed stochastic cooling upgrades

FEB 1988

J. Peoples, 3rd Director

FEB 1989

October 18, 1989
President G. Bush presents the 1989 National Medal of Technology to four Tevatron scientists.



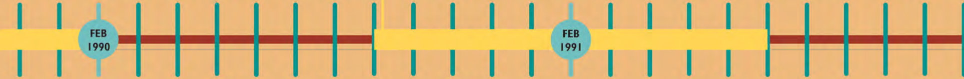
1988 Run

Accelerating to Top

November 1990
Installation of Separators (*Enabled 36 bunch operation*)

February 1990
Stochastic cooling upgrades
in the Accumulator completed

SHUTDOWN September 1990 - July 1991



October 1990
Cold iron new low beta quads at B0 and partial installation at D0

At Industrial Center

At B0

Completed installation

Welding & insulation

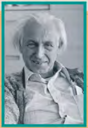
Instal

May 14, 1992
The new D0 detector observes first collisions

FY92 DOE Budget Request for the Main Injector
"Purpose, Justification of Need for, and Scope of Project:
A luminosity of 5×10^{31} cm^{-2} sec^{-1} is required to maximize the likelihood of discovery of the Top quark, the last unobserved fundamental particle forming the basis of our current understanding of the structure of matter."

March 22, 1993
Ground breaking for Main Injector

May 17, 1993
T. Collins wins the Particle Accelerator Science and Technology Award for his invention of long, straight section for synchrotron and storage rings and his design of Fermilab's accelerator lattices.



September 27, 1993
Tevatron's cryogenic cooling system is named International Histor
Engineering Landmark by the American Society of Mechanical

INTERNATIONAL HISTORIC
MECHANICAL ENGINEERING LANDMARK
CRYOGENIC COOLING SYSTEM
OF THE
FERMILAB TEVATRON ACCELERATOR
1983
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS--1993

June 1993
Installation of cold compressors *(Enabled operation at 980 GeV)*

SHUTDOWN 1.09.92 — 5.13.92
Installed the A0 abort system, new Tevatron separators, and new B0 & D0 low beta circuits.
Tiger Team arrived in the end of shutdown (May 11 - June 8, 1992).

FEB 1992

FEB 1993

FEB 1994

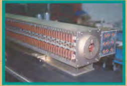
February 1992
of cold iron low beta quads and separators at D0
D0 - overpass

lation at D0

First separator at D0

August 31, 1992
Run I begins
The first Tevatron run with two collider detectors (1.8 TeV)

January 1993
Installation of new pbar injection kicker



2,172
EMPLOYEES

1993

Run IA

June 1993 — December 1993
Installed cold compressors and 400 MeV Linac

May 31, 1993
Run Ia ended

December 15, 1993
Run Ib started

September 4, 1993
First 400 MeV Linac beam

August 27, 1993
All necessary sign-offs complete and AD was granted permission to begin commissioning the new 400 MeV Linac.

April 26, 1994
CDF announces first evidence for **Top**

ric Mechanical
Engineers.

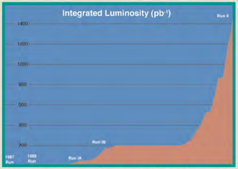
Run Ib continues

2,151
EMPLOYEES

1995

Run IB

Center of accelerator operations, the Main Control Room (January 19, 1996)



Integrated Luminosity: February 2, 1987 - October 2, 2005

March 2001
Start of Run II

FEB 1995

FEB 1996

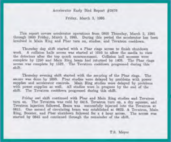
M. Witherell, 4th Director

P. Oddone, 5th Director

OCTOBER 2, 2005: $1.46 fb^{-1}$

Quark

March 2, 1995
CDF and D0 announce the discovery of the **Top Quark**.



Accelerator Early Bird Report #2878

Friday, March 3, 1995

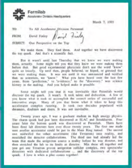
This report covers accelerator operations from 0800 Thursday, March 2, 1995 through 0800 Friday, March 3, 1995. During this period the accelerator has been involved in Main Ring and Pbar turn on, studies, and Tevatron cooldown.

Thursday day shift started with a Pbar rings access to finish shutdown work. A collision halls access was started at 1010 to allow the media to view the detectors after the top quark announcement. Collision hall accesses were complete by 1250 and Main Ring beam had returned by 1408. The Pbar rings access was complete by 1522. The Tevatron cooldown progressed during this shift.

Thursday evening shift started with the securing of the Pbar rings. The secure was done by 1635. Pbar studies were delayed by problems with power supplies and accelerator controls. Main Ring studies were delayed by problems with power supplies as well. All studies were in progress by the end of the shift. The Tevatron cooldown progressed during this shift.

Friday owl shift continued with Pbar and Main Ring studies and Tevatron turn on. The Tevatron was cold by 0415. Tevatron turn on, a dry squeeze, and Tevatron injection followed. Beam was successfully injected into the Tevatron at 0615. One second of circulating beam was established at 0622. A Tevatron, Main Ring, Booster, and Pbar shutdown followed for a 4 hour access. The access was started by 0645 and continued through the remainder of the shift.

T.S. Meyer



Fermilab
Accelerator Division Headquarters

March 7, 1995

TO: To All Accelerator Division Personnel

FROM: David Finley David Finley

SUBJECT: One Perspective on the Top

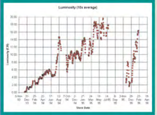
We make them. They find them. And together we have discovered the top quark. And that's a scientific fact.

But it wasn't until last Thursday that we knew we were making them, actually. Some might tell you that they knew we were making them before that. But good experimental physicists don't use the word "know" quite so loosely. Up until then, people believed, or hoped, or guessed that we were making them. It was not until it was announced and verified that, as scientists, we "knew." What you have heard over the last few years, from "prediction," to "evidence," to the "discovery," was science history in the making. And you helped make it possible.

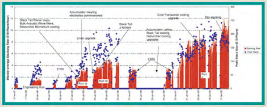
Some might tell you that it was inevitable that Fermilab would discover the top quark. It wasn't. It took talent and dedication. A few of you know what it took to accomplish the correct series of successful and innovative steps. Many of you that know what it takes to keep this accelerator complex running. It took two decades populated with dreamers, doubters and doers. It was not inevitable.

Twenty years ago, I was a graduate student in high energy physics. The charm quark had just been discovered at SLAC and Brookhaven. Four years later the bottom quark was discovered at Fermilab. There have been three lab directors here over those twenty years. The first one made sure another accelerator could be put in the Main Ring tunnel. The second one midwifed the other accelerator (the Tevatron) into reality, and nourished the detector collaborations. The third one had already led the team that made the antiproton source a reality before he was director, and then stretched the lab to its limits as director. Mix these all together and you get one Tevatron proton antiproton collider complex, two spectacular detectors with dedicated collaborations ... and the discovery of the top quark. I love it when a plan comes together!

February 19, 1996
End of Run I and start of shutdown to complete MI



Peak Luminosities during Run Ib



Pbar Stacking Rate, 1987 - 2005