

# Building the Superconducting Super Collider, 1989 – 1993:\*

## The Problem of Project Management

Michael Riordan

*UC Santa Cruz &  
Stanford University*

*\*Research supported by  
NSF Award No. 823296.*



# Major Projects in High-Energy Physics

## Stanford Linear Accelerator Center

- constructed 1961–1966
- \$114 million (~ \$600 million 1990\$)
- Wolfgang Panofsky, SLAC Director

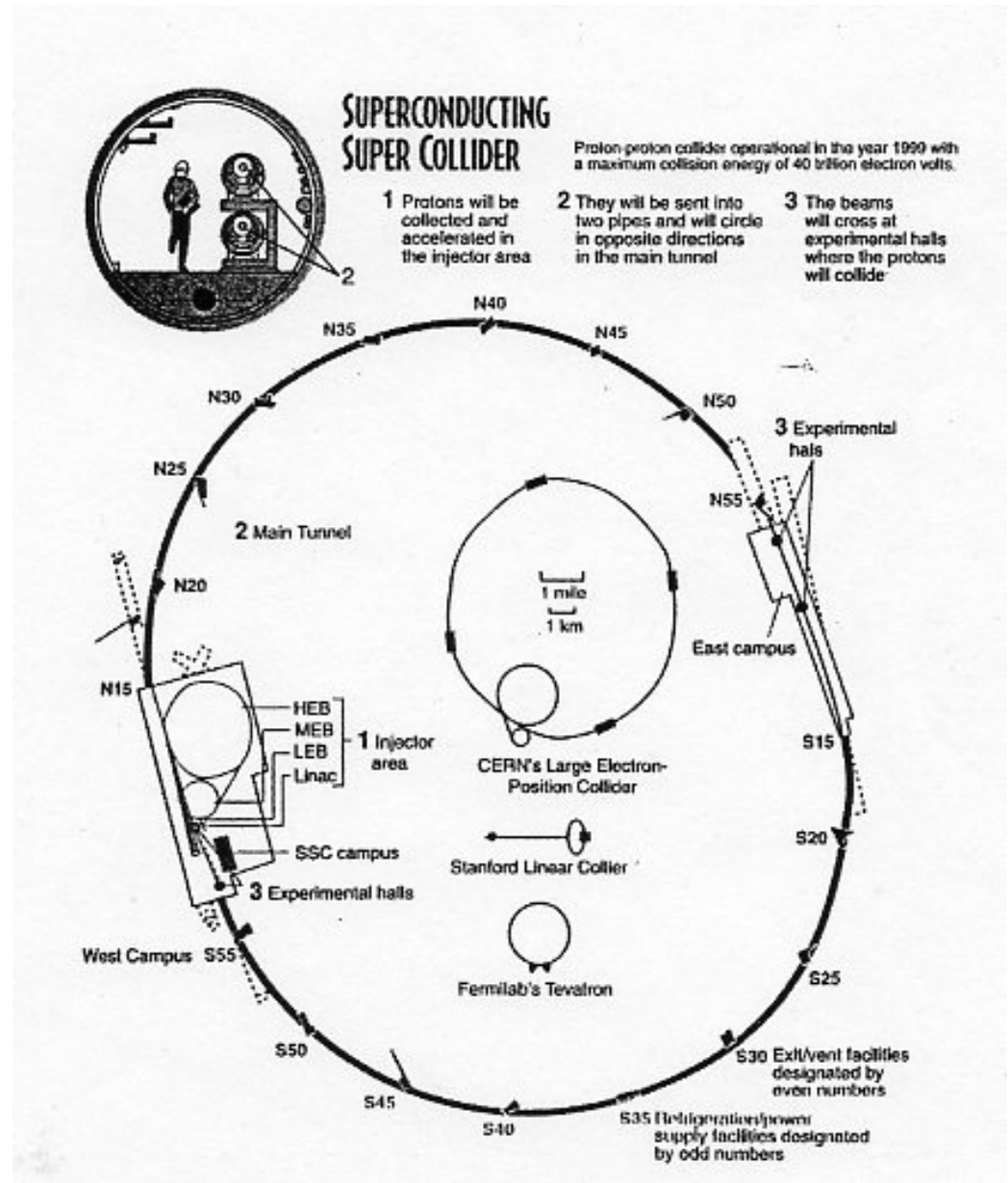
## Fermi National Accelerator Laboratory

- constructed 1968–1972
- \$243 million (~ \$800 million 1990\$)
- Robert Wilson, Fermilab Director

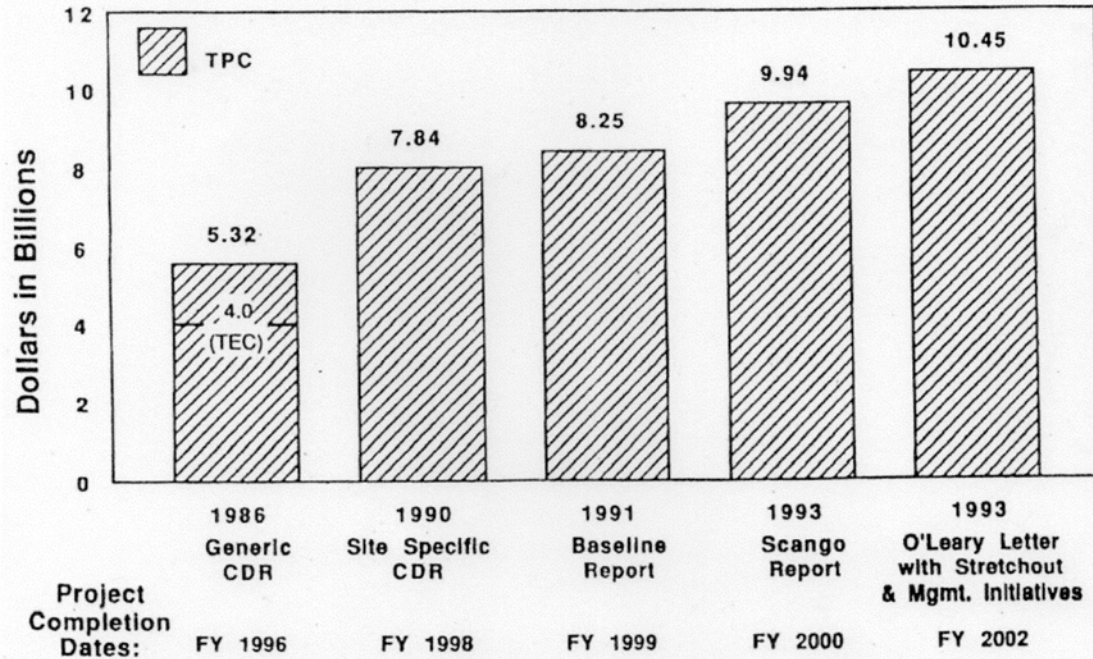
## CERN Large Electron Positron Collider

- constructed 1983–1989
- 910 million Swiss francs\* (budgeted)
- Herwig Schopper, CERN Director
- Emilio Picasso, Project Manager

\*external costs of equipment only, as projected, in 1983 Swiss francs. Later cost overruns — tunneling under Jura



## Total Project Cost (TPC) History of SSC



## SSC Cost Growth, 1986–1993

From Daniel Lehman, "Lessons Learned from the SSC," 1994

Figures given in projected "as-spent" dollars, including expected inflation

Which one is the **Project Manager**?



# Which one is the **Project Manager**?

And who is the **Chief Scientist** reporting to him?



## The Proposed SSC Management Team\*

### Universities Research Association, Inc.

- non-profit corp. of ~ 80 universities
- Fermilab M&O contractor since 1968

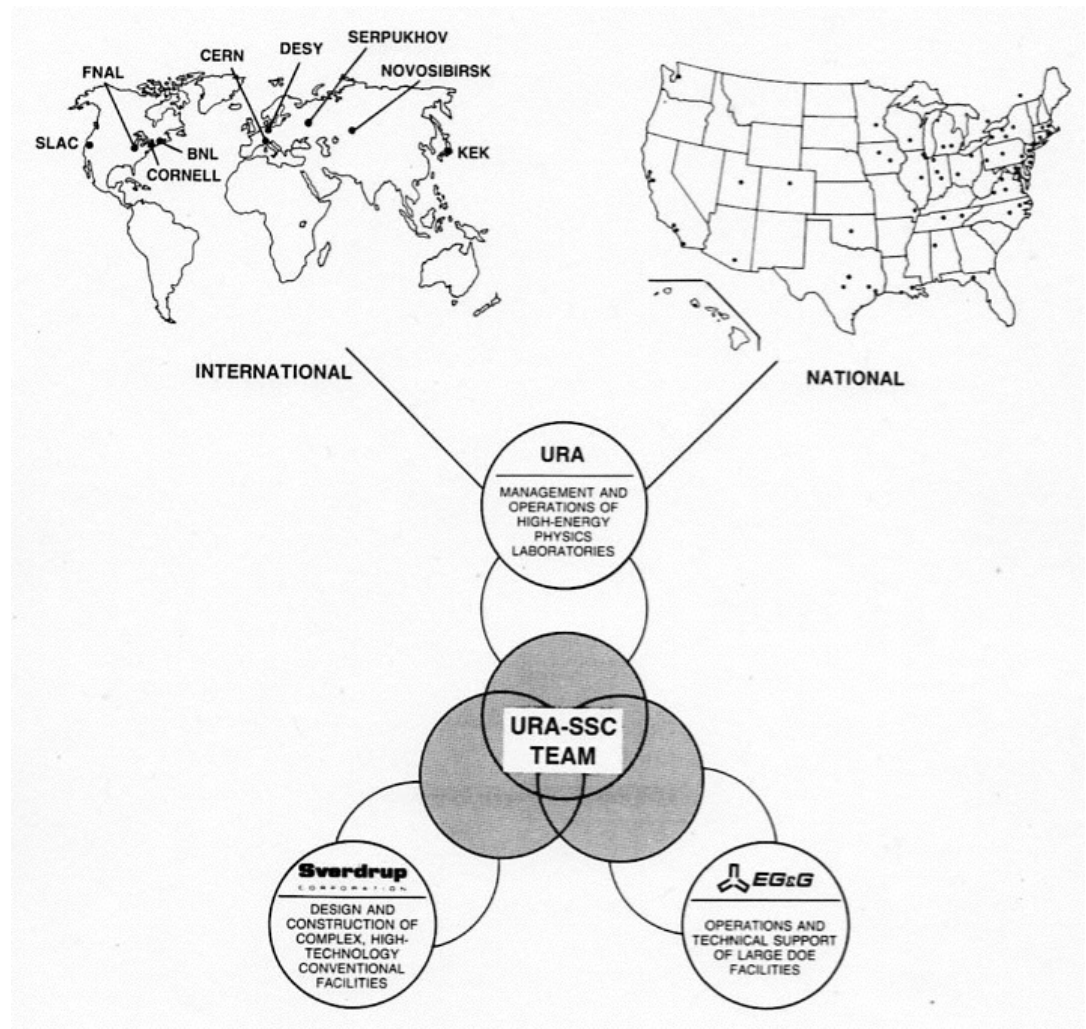
### Sverdrup Corporation, St. Louis

- construction management firm
- Trident Submarine Base, Georgia
- Baltimore Harbor Tunnel

### EG&G, Inc., Boston

- operations management firm
- Idaho Engineering Laboratory
- Nevada Test Facility

\* from URA SSC Management and Operations Proposal, November 1988



# Proposed SSC Leadership, November 1988

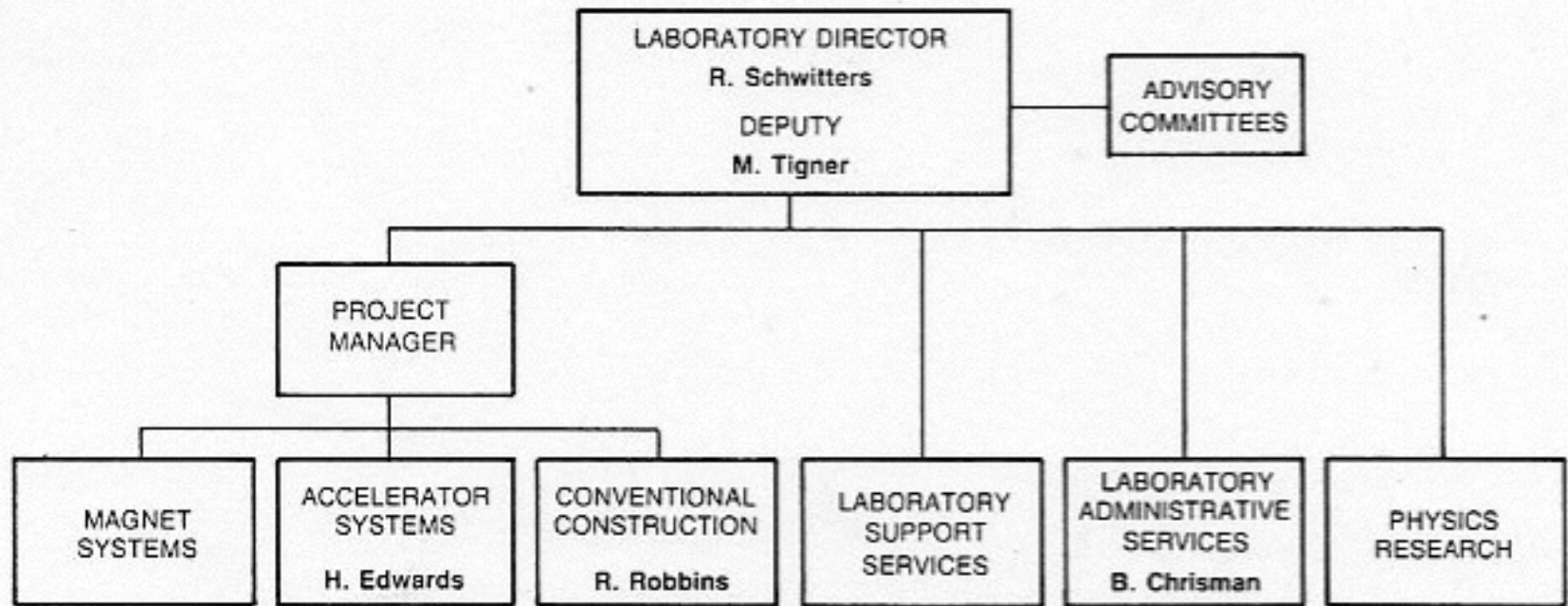
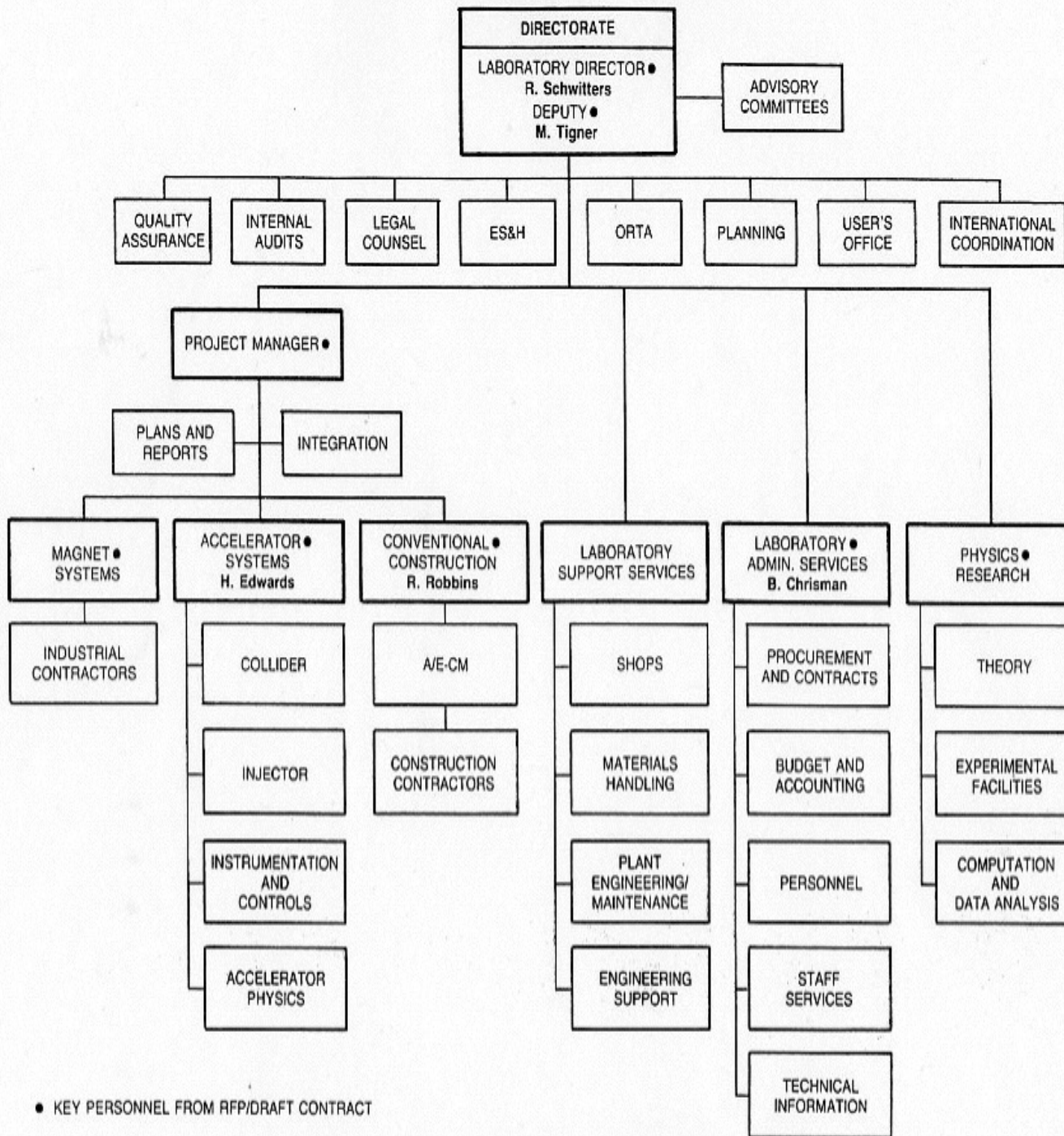


Figure 3.5-1. URA-SSC Laboratory organization.



• KEY PERSONNEL FROM RFP/DRAFT CONTRACT



# SSC Lab Director Roy Schwitters



# The SSC Project Manager Parade:

- N. Douglas Pewitt (acting), March to October 1989  
— former high government official in OMB, DOE and OSTP
- Richard L. Briggs, October 1989 to March 1990\*  
— project manager on LLNL induction accelerator (~\$100M project)
- N. Douglas Pewitt (acting), March to May 1990
- Theodore Kozman (acting), May to September 1990  
— LLNL/LBL mechanical engineer, head of SSC Accelerator Systems Div.
- Paul Reardon, October 1990 to December 1991\*  
— former Fermilab Business Manager, Brookhaven Associate Director

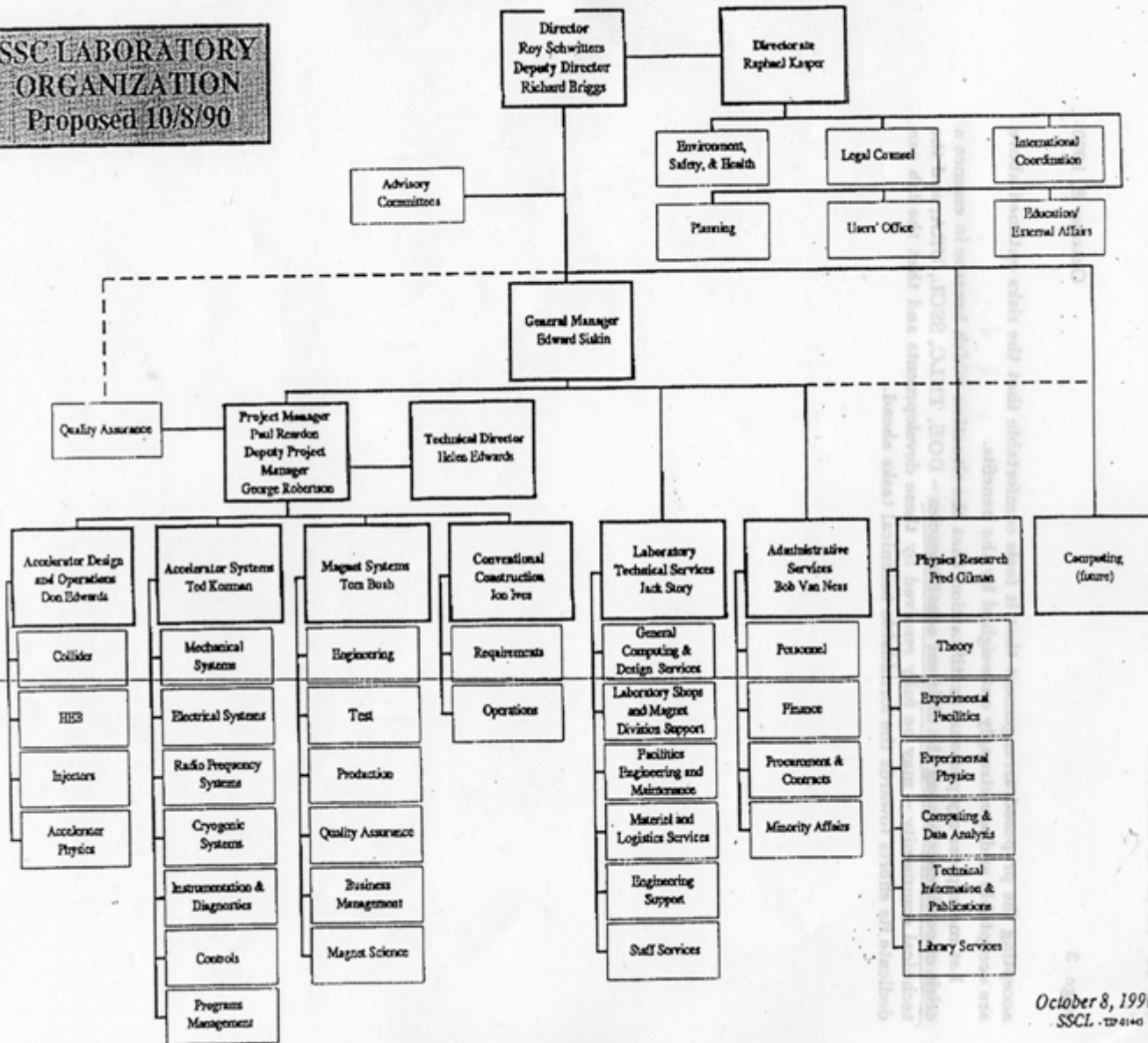
\* DOE held up both Project Manager candidates put forth by URA.

# DOE's Candidate: Edward Siskin

- B.S. degree, Electrical Engineering, Univ. Pennsylvania, 1963
- Naval Reactors Division, Atomic Energy Commission, 1970-84
  - reported to Admiral Hyman G. Rickover, head of the “Nuclear Navy”
  - knew DOE Secretary Admiral James Watkins from Navy experience
- Executive Vice President, Stone & Webster Corp.\*, 1984-89
  - was responsible for S&W operations in southeastern United States
  - included all S&W nuclear work and chemical plant safety work
- Registered Professional Engineer in Electrical, Mechanical, Chemical, Civil and Nuclear Engineering

\* Stone & Webster was construction manager for Oak Ridge lab in WWII.

**SSC LABORATORY ORGANIZATION**  
Proposed 10/8/90

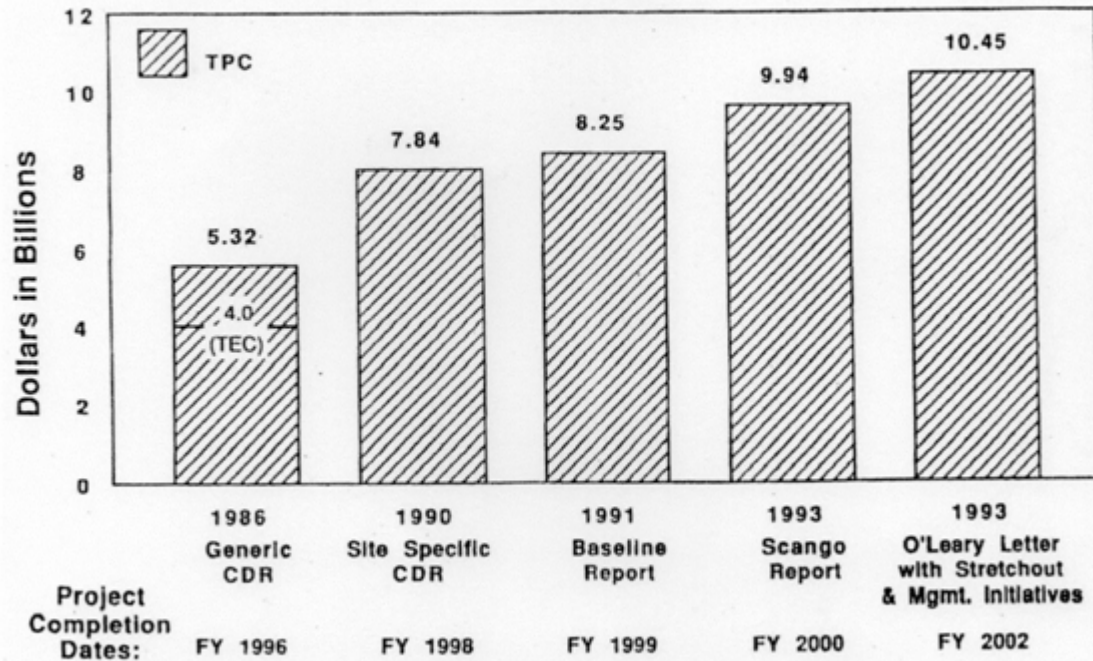


October 8, 1990  
SSCL-124140

# SSC Project Manager Parade, Continued:

- N. Douglas Pewitt (acting), March to October 1989  
— former high government official in OMB, DOE and OSTP
- Richard L. Briggs, October 1989 to March 1990  
— project manager on LLNL induction accelerator (~ \$100 M project)
- N. Douglas Pewitt (acting), March to May 1990
- Theodore Kozman (acting), May to September 1990  
— LLNL/LBL mechanical engineer, head of SSC Accelerator Systems Div.
- Paul Reardon, September 1990 to December 1991  
— former Fermilab Business Manager, Brookhaven Associate Director
- John Rees, January 1992 to October 1993  
— project manager on SLAC PEP and SLC colliders (~ \$100 M projects)

## Total Project Cost (TPC) History of SSC



## SSC Cost Growth, 1986–1993

From Daniel Lehman, "Lessons Learned from the SSC," 1994

- 1993 figures include impact of the "Clinton Stretch-Out"

# Observations and Opinions

- It was a big mistake to build the SSC at a new, green-field site.
- The DOE was justified to insist that URA have *someone* with large-project management experience in a top management position, but it did so in a counter-productive manner.
- Nobody in high-energy physics had such experience in 1989.
- A good part of the cost overruns experienced on the SSC can be attributed to the absence of a strong project manager.
- While Siskin and Rees were beginning to bring the SSC project under control at the end, it was too little and (much) too late.

# Tunnel Visions:

The Rise and Fall  
of the  
Superconducting  
Super Collider

by Michael Riordan,  
Lillian Hoddeson  
and Adrienne Kolb

