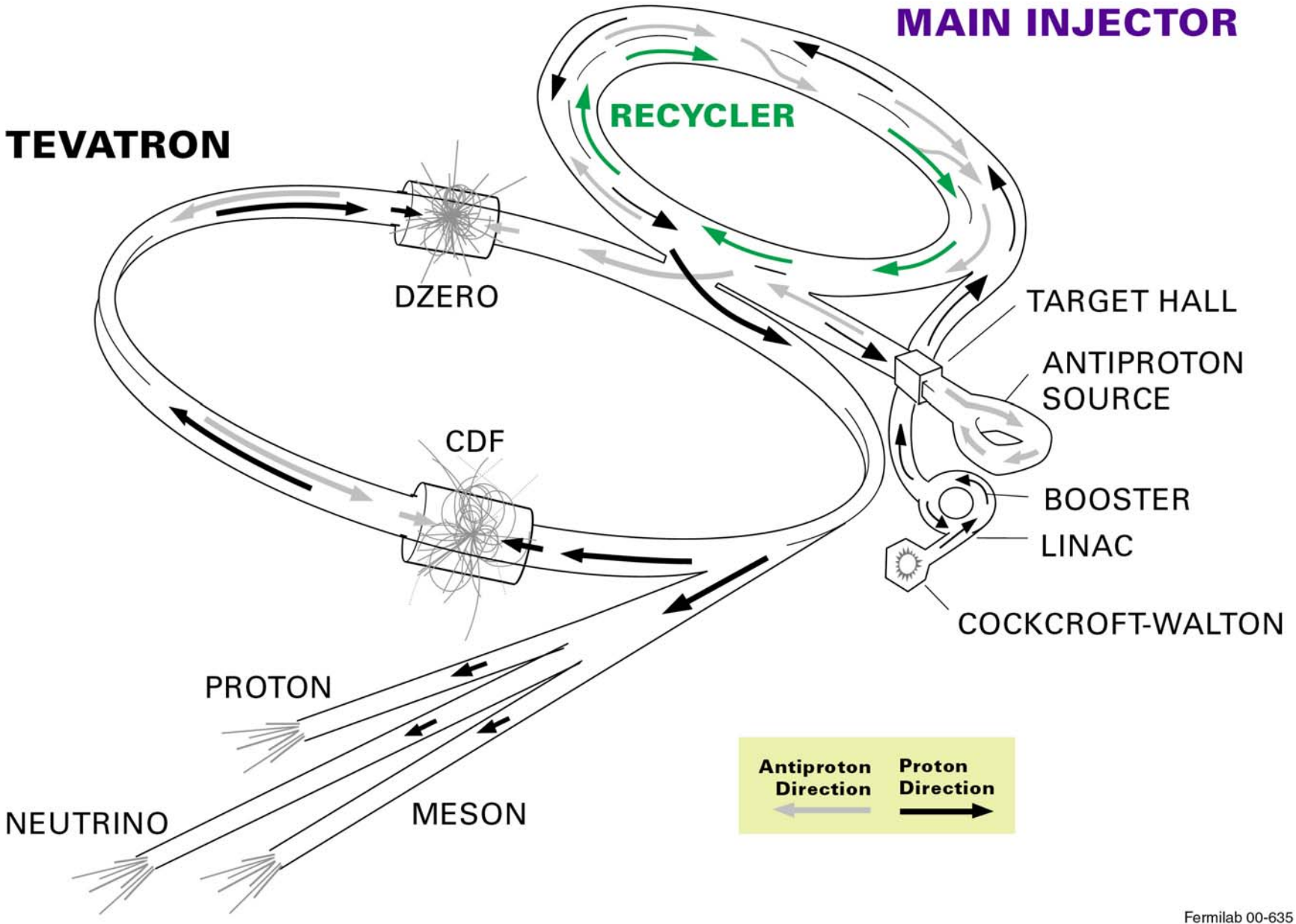
Overview of Run II Strategy and Organization

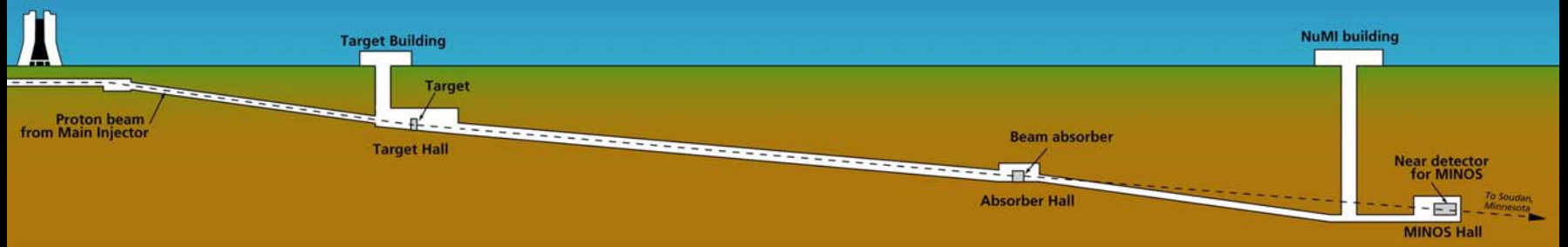
R. Dixon

FERMILAB'S ACCELERATOR CHAIN



Fermilab 00-635

NuMI Tunnel Project



Soudan
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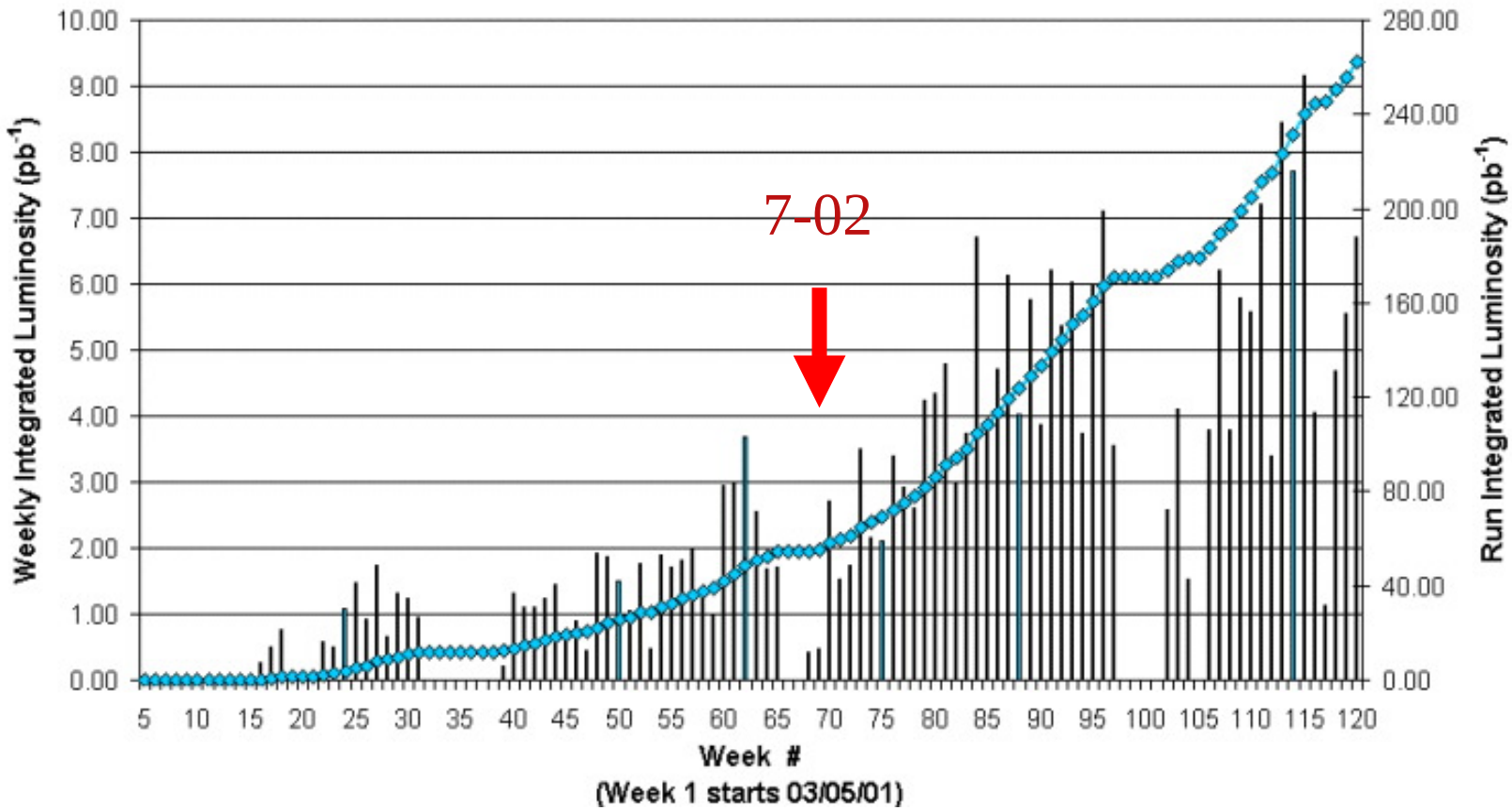
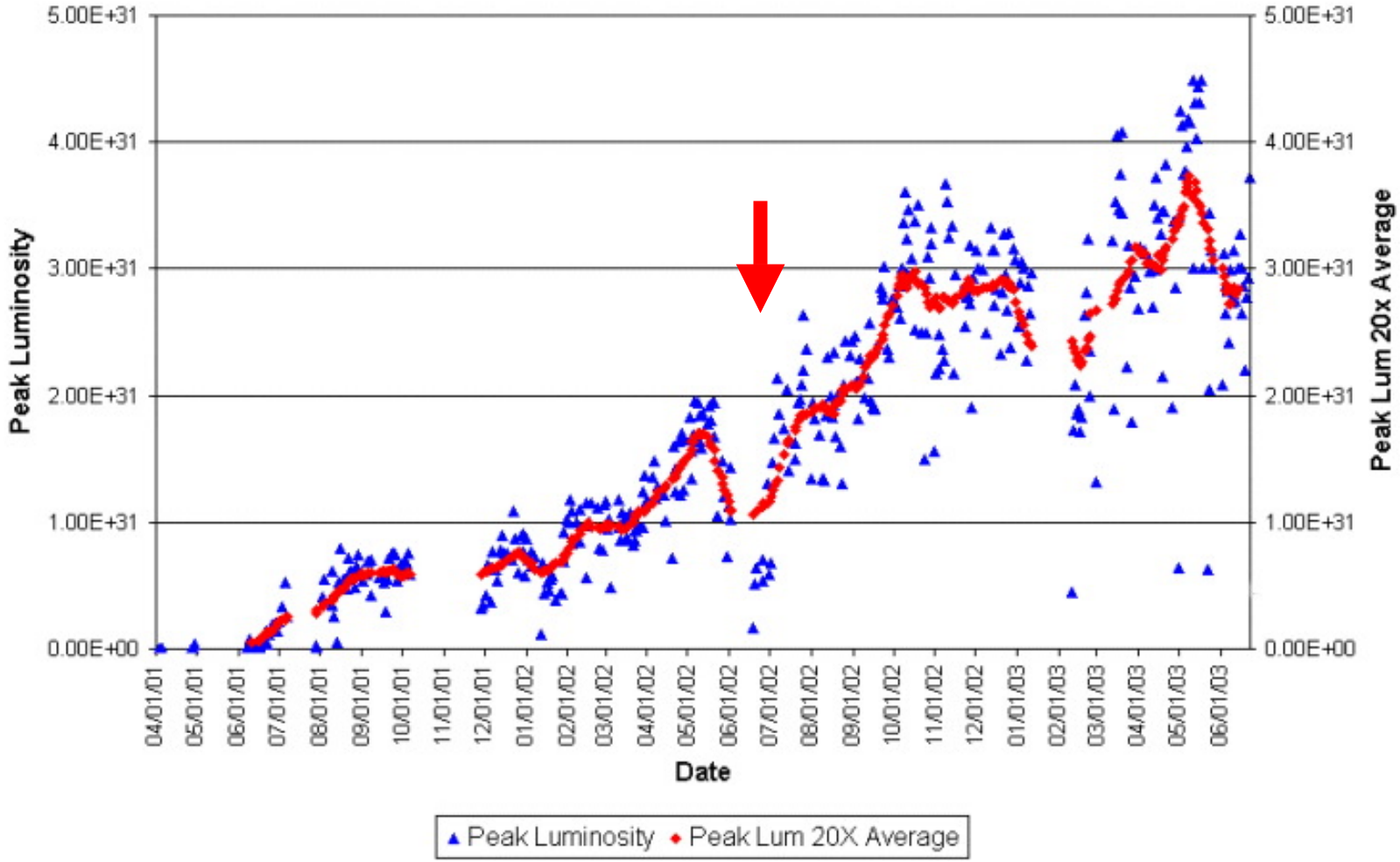
Run II Integrated Luminosity



Peak Luminosity



Accomplishments During the Past Year

- Luminosity increases
  - Factor of 2.3 in weekly integrated luminosity
  - Factor of 2.5 in peak luminosity achieved
  - 210 pb-1 integrated during the past year
- Major accomplishments
  - Booster intensity
    - Discovery of dogleg problem
  - Tevatron transverse dampers
  - Removal of C0 Lambertson
    - Decreases transverse impedance in Tevatron
    - Increase separation of the beams
  - Improved cooling in Pbar source
- Discoveries
  - Tevatron Alignment
    - Magnet roles
    - Settling of the cold mass inside of the iron

Difficulties Encountered

- Luminosity
  - Emittance growth
    - Transfer into Tevatron
    - On Tevatron Ramp
  - Efficiencies on all transfers
  - Proton intensity from the Booster
- Reliability Issues
  - Linac PA Tubes
  - Power infrastructure
  - Thirty two-year-old linac and Booster
  - Twenty-year old Tevatron
- Recycler Integration

Run II Plan

- Short Term (2004 --> 2005)
  - Fully integrate dampers in MI and Tevatron
  - Improve injection matching into the Tevatron
  - Fix alignment problems in Tevatron
  - Improved beam separation to mitigate beam-beam effects
  - Further improvements in the Booster
  - Improve instrumentation
    - Tevatron BPM's
    - MI BPM's
  - Improving stacking rate
  - Commission the Recycler
- Long Term (2005 -->2006)
  - Integrate Recycler w/electron cooling
  - Additional passive beam-beam compensation
  - Active beam-beam compensation

Integration of Run II Plan

- Short Term and Long Term upgrade efforts
- Operations
  - Collider
  - MiniBooNE
  - SY120
- Reliability and vulnerability improvements
- Improved controls
- Increased data analysis for shots
- Installation and Commissioning NUMI beam

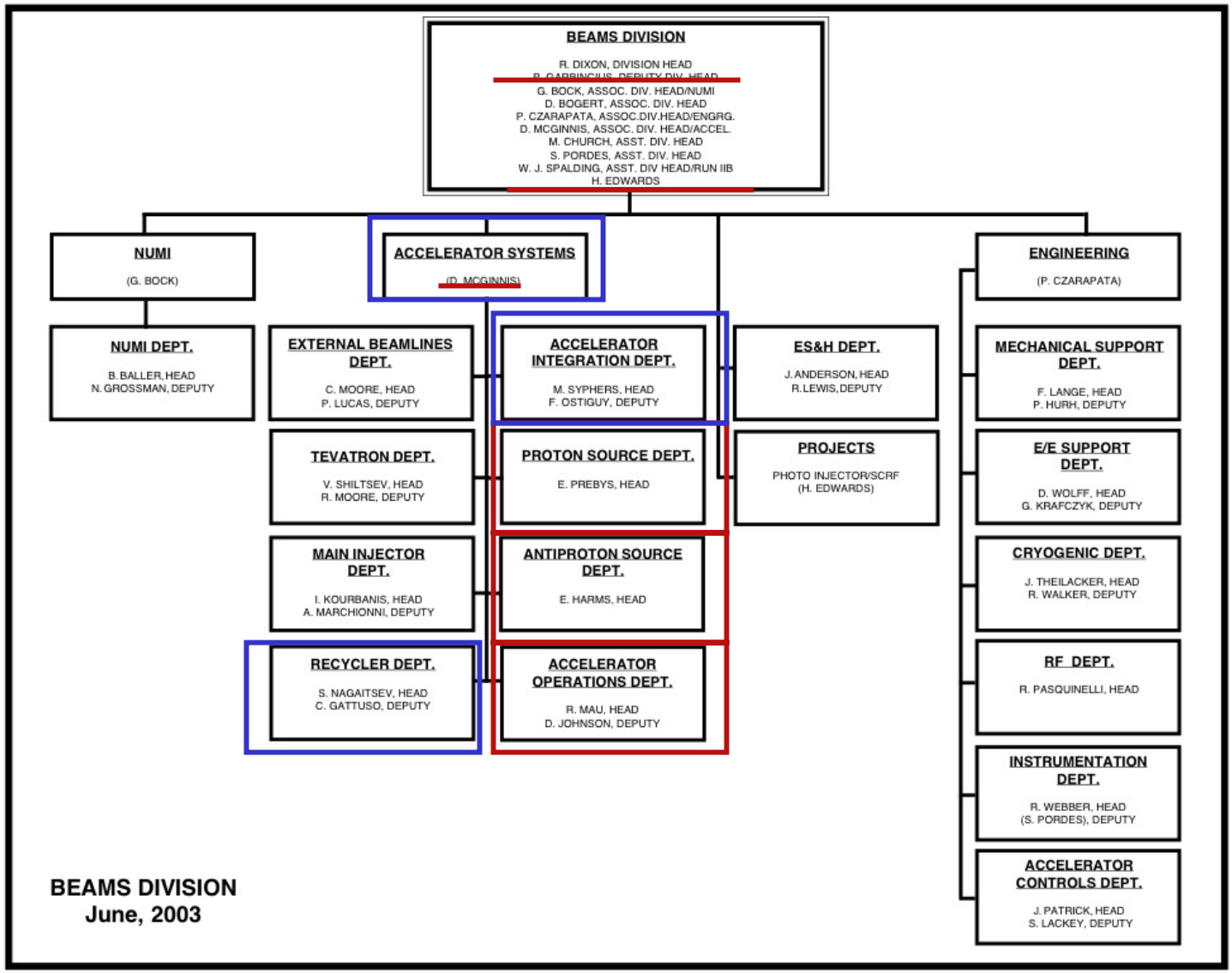
Strategy

- All efforts and planning must be integrated within the Division
  - Division Headquarters management team
- Magnitude of task requires help from
  - Other Divisions within the Laboratory
    - Current examples
      - Tevatron BPM's (Computing Division)
      - Recycler vacuum work (Tech Division + Particle Physics)
      - Electron cooling (Tech Division)
  - Users
    - For example shot data analysis
  - Other Laboratories
    - Instrumentation
    - Modeling

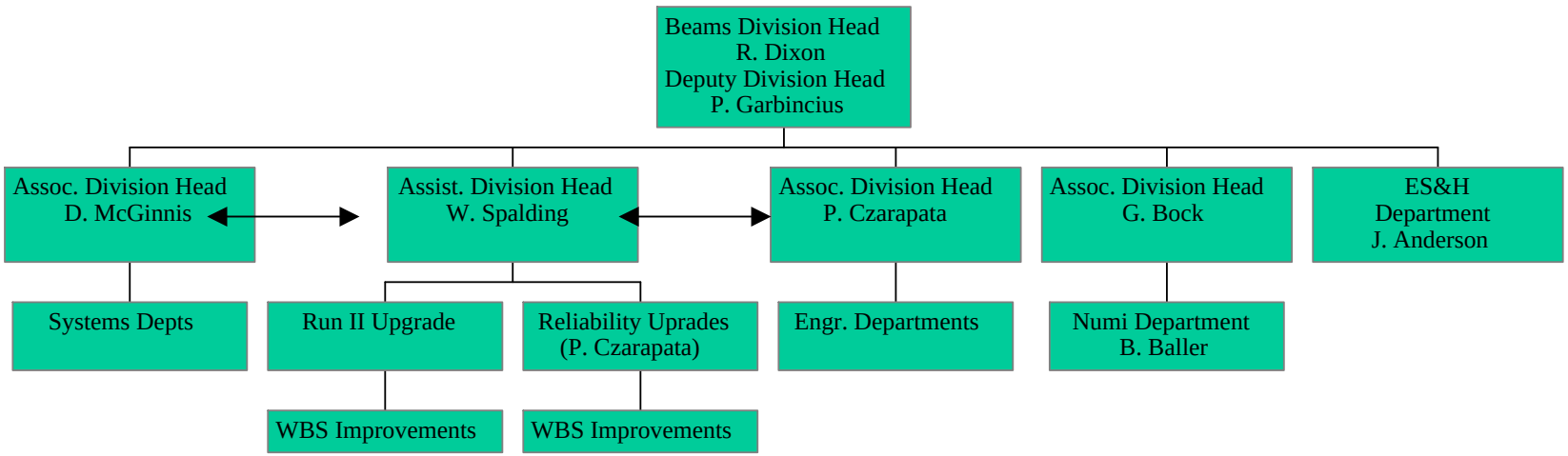
Organization

- Focus on integration
  - Integration Department
    - Beam Physics
    - SDA
  - Associate Head for Accelerators
    - Line responsibility for systems departments
    - Line responsibility for Operations
- Focus on Recycler Commissioning
  - Recycler Department
  - Increased effort
- Focus on Electron Cooling
  - Integrate with Recycler Department
  - Increased effort

Beams Division Organization



Run II Upgrade Organization



Summary

- During the past year we have
  - Continued to improve our luminosity performance
  - Developed an upgrade plan to maximize integrated luminosity in the pre LHC era
  - Integrated this plan into the overall plan for the Beams Division
  - Organized the Division to better attack the remaining problems of upgrading and operating.