# what to do if … ?

- *possible problems*
- *possible responses*

Frank Zimmermann, LHCCWG 13.12.2006

Based on discussions with Roger Bailey

# possible problems

- not **getting beam around**
- **aperture** too small
- static or transient β **beating** larger than tolerance
  → collimator set up, aperture
- not meeting other **optics tolerances**
- larger **emittances** than expected
- large **bunch-to-bunch variation (N, ε)**
- poor **beam lifetime** (vacuum, dyn.ap., instabilities,…??)
- unexplained **fast beam loss**
- unacceptable **detector backgrounds**
- not **getting beams into collision**
- frequent **quenches, or** frequent **BIS dumps**
- **no protons** from injectors

# possible reactions

- **find root cause and fix**
  - **speeded up by advance plan & procedures**

- **relax requirements** and, e.g., limit intensity and/or find other **solution around**, e.g. larger $\beta^*$
  - **back-up operating modes to be prepared beforehand**

- … ?

in which detail should we look at problem scenarios?

**real problems** often turn out to be completely different from anticipated ones …

MARINES

THE FEW. THE PROUD.

America's Marine Corps never makes detailed studies in advance. Leaving important things to the last minute reduces the risk of wasting time on things that may ultimately prove not important at all.

The Economist, Jan 4th, 2007