Citicorp Tower

- Built in 1977
- Manhattan, New York
- William LeMessurier, Structural Engineer
Outline

- Technical Issues
- Events that occurred as a result
- Stakeholders and Ethical issues
- Scenario Analysis
- Relation to Software Engineering
Technical Aspects

- Built on 4 nine-storey high stilts
- Supports 25,000 tons of steel
- Tuned Mass Damper
The Events

- June, 1978
  - Phone call from a tentative student
  - Decided to give a lecture on the tower
  - Calculated the wind stress on the tower
  - Situation was identified
The Events

• July 24^{th}, 1978
  - Flew to New York to investigate the bolt design
  - Designs only considered perpendicular winds
  - High winds were also not considered
The Events

• July 26\textsuperscript{th}, 1978
  - LeMessurier flew to London, Ontario to meet Alan Davenport
  - After wind tunnel testing they concluded that the situation could be worse than LeMessurier preconceived
The Events

- **July 28\textsuperscript{th}, 1978**
  - Worked through the wind tunnel numbers
  - Calculated that a sixteen-year storm could result in a catastrophic outcome
  - Evaluated his options
    - Stay silent
    - Commit Suicide
    - Blow the whistle on himself
  - Decided to turn himself in
The Events

- **August 1\textsuperscript{st}, 1978:**
  - Approached his liability insurer
  - Meet with appointed lawyers

- **August 2\textsuperscript{nd}, 1978:**
  - Meet with Executive VP of Citicorp, John S. Reed
The Events

- **August 8th, 1978:**
  - Citicorp puts out a press release

- **September 13th, 1978:**
  - Citicorp served LeMessurier and Hugh Stubbins with a lawsuit for $4.3 million

- **October, 1978:**
  - Welding completed
Stakeholders

- William LeMessurier
- The owners of Citicorp
- Hugh Stubbins, the architect
- Bethlehem Steel
- Insurance companies
- The possible casualties
Ethical Standards

- Engineers shall be honest.
- Engineers shall be loyal to employer or client.
- Engineers shall hold paramount the safety, health and welfare of the public in the performance of professional duties.
- Engineers shall not go public unless necessary; furthermore, they shall issue public statements in an objective and truthful manner.
- Engineers shall disclose conflict of interest beforehand.
- Engineers shall expose risks openly to supervisors.
- Engineers shall obey the law.
- Engineers shall participate in a lifelong learning process regarding the practice of their profession.
- Engineers shall perform services only in areas of competence.
What if he stayed silent?

- What would be the consequences?
  - Loose his license
  - Full financial liability
  - Jail time
What if there was insufficient theory?

- **Vasa Ship Wreck**
  - Theory on Stability was nonexistent
  - No recorded punishments
- **Society sets expectations**
Where does Software Engineering stand?
Conclusion
Questions
Additional Reading

“The Fifty-Nine-Story Crisis”
Joe Morgenstern
*The New Yorker*, May 25th, 1995

“LeMessurier’s Confession”
Richard Korman
*Engineering News Record*, October 30th, 1995

“Critics grade Citicorp confession”
Richard Korman
*Engineering News Record*, November 20th, 1995