Risks

bjc

Social Implications of Computers

Risks Digest (Peter Neumann)

- # 1.1 Recent yet-to-be-merged items
- # 1.2 11 Sep 2001 and Homeland Security
- # 1.3 Space
- # 1.4 Defense
- # 1.5 Military Aviation
- # 1.6 Commercial Aviation
- # 1.7 Rail, Bus, and Other Public Transit
- # 1.8 Ships
- # 1.9 Automobiles
- # 1.10 Motor-Vehicle and Related Database Problems
- # 1.11 Electrical Power (nuclear and other) and Energy
- # 1.12 Medical, Health, and Safety Risks
- # 1.13 Other Environmental Risks
- # 1.14 Robots and Artificial Intelligence
- # 1.15 Other Control-System Problems
- # 1.16 Other Computer-Aided-Design Problems
- # 1.17 Accidental Financial Losses, Errors, Outages
- # 1.18 Financial Frauds and Intentionally Caused Losses
- # 1.19 Stock-Market Phenomena
- # 1.20 Telephone Frauds

- # 1.21 Other Telephone and Communication Problems
- # 1.22 Election Problems
- # 1.23 Insurance Frauds
- # 1.24 Security Problems
- # 1.25 Cryptography
- # 1.26 April Foolery and Spoofs
- # 1.27 Privacy Problems
- # 1.28 Spamming, Phishing, Junkmail, and Related Annoyances:
- # 1.29 Other Unintentional Denials of Service:
- # 1.30 Law Enforcement Abuses, False Arrests, etc..
- # 1.31 Identity Theft, Internet Fraud, Mistakes, Related Problems
- # 1.32 Other Legal Implications
- # 1.33 Other Aggravation
- # 1.34 Calendar/Date/Clock Problems including Y2K
- # 1.35 The Game of Chess:
- # 1.36 Miscellaneous Hardware/Software Problems
- # 1.37 Other Computer System Development Difficulties
- # 1.38 Achieving Better System Development and Operation
- # 1.39 The Proper Role of Technology?

http://www.csl.sri.com/users/neumann/illustrative.html

Therac-25

- *Therapeutic X-ray machine (1985-87)*
- *6 accidents, 4 deaths*
  - *but 100s of lives saved*
- *no bad guys (cf. Ford Pinto case)*
- *Software doesn't degrade like hardware*
  - *but it rots anyway*
  - *but it has much greater complexity*
- *Therac bugs*
  - *no atomic test and set*
  - *- hardware interlocks removed*
  - *User interface problems:*
    - *cursor position*
    - *defaults*
    - *too many error messages*

  - *documentation*
  - *organizational response*
    - *easy to see after the fact, but problems are inherent in organizations (esp. ones that can be sued)*
- *Solutions*
  - *redundancy*
  - *fail soft (work despite bugs)*
  - *audit trail*
  - *Software Engineering (an attitude about programming)*
    - *Design techniques*
    - *Verification techniques*
    - *Debugging techniques*

Apocalyptic risks

- *Nanotechnology*
  - *self-replicating "grey goo"*
- *Genetic engineering*
  - *super-viruses*
  - *supermen*
- *Low probability, high damage*