Resilient dam management

Chris Nielsen
Department of Natural Resources, Mines and Energy
Dam safety regulation in Queensland

- Dam Safety team regulate dams that could pose a threat to life
- Population at Risk (PAR)
- Called ‘referable dams’
Referable dams

• Oldest dam – Enoggera Dam (1866)
• Newest dam – Wyaralong (2011)
• Detention basins, farm dams constantly being constructed
• Highest dam – Hinze Dam Gold Coast at 83 metres
• Largest capacity – Burdekin Falls Dam at 1,860,000 ML
Dam failure influences on engineering

USA:

• Mill River Dam (1874) – 139 fatalities
  Regulation requiring engineers to work on dams

• South Fork (1889) – 2209 fatalities
  Significant development of liability laws

• St Francis Dam (1928) – >431 fatalities
  Engineers must be registered (California)

Australia:

• Briseis Dam Tasmania (1929) – 14 fatalities

• RPEQ commenced 1929
  reflected public safety concerns from the Depression era
How safe?

• What risk can we tolerate?
• Dam safety standards are based on ethical, societal and legal motivations (not ‘engineering’)
  • Individual risk
  • Societal risk
  • ‘Legal’ risk
Individual risk

• The increment of risk on a person should be close to what a person lives with on a daily basis

• Why? - Equity
Societal risk

- Infrastructure failure with multiple fatalities is not tolerable in our community
- A structure should be safer if consequence of failure are higher
‘Legal’ risk

- Reduce risks to be ‘as low as is reasonably practicable’
Queensland regulation, managing risks

- Appropriate capabilities and resources
- Work with industry, encourage compliance
- Targeted risk reduction
  - Focused, prioritised regulatory activities
- Lead the industry to achieve best practice
  - Continuous review of standards and guidelines
  - Consultation and engagement, training and education
  - Support and contribution to R&D