Public Safety and Levees
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• What is the effect of operations and maintenance on safety?
  – O&M helps sustain original reliability
    • Immediate, certain, & frequent feedback on condition
    • Critical component of broader safety program
  – O&M is much more than just mowing the grass.
  – Conversely, proper O&M is no assurance of safety
    • In terms of inspections, O&M is a surface look – *Tip of the iceberg*
  – An element of Risk communication: Documents performance and communicates to land use agencies, public safety departments, etc.
  – Is subsidence O&M?

• What happens if my levee fails inspection?
  – Inactive in PL84-99 – risk losing rehab funding
  – Drives Action: Risk communication, remedial actions, issues of liability if levee then fails in storm event
  – More discussion needed on how inspection ratings are formulated
  – Establish minimum approaches to safety, informed by risk
    • Linked to consequences
    • Linked to uncertainty in hazards and performance
    • Resilience!
    • Failure modes
  – Help define shared responsibilities in risk reduction
  – Need more work on system effects
  – Levee Safety/Risk Classification is needed

• How safe is safe? Is a 100 year levee safe?
  – Level of safe is based on our shared risk tolerance. *What is acceptable?*
  – NFIP is not a safety standard, but insurance influences safety
  – Minimum Engineering standards are part of determining how safe…
  – But Public safety is a broad issue with need for societal acceptance
  – Standards need to be dynamic, consider change

• What is the difference between the FEMA 100-year standard, a Corps Standard flood and a probable maximum flood?
  – Levees need as rigorous design process as dams?
  – There’s a dam break analysis, why not a levee analysis?
    • PMF can happen to a levee just like a dam
  – Emergency action plans and evacuation should be part the certification process
  – Flood insurance should be viewed as good for safety, but more economic incentives for greater levels of protection make sense
  – Climate change must be considered
  – Engineering standards, like safety, environmental, and fiscal standards are risk based
  – Risk Awareness, Education, and Communication is key
• Can multiple objectives be integrated without compromise (development, environment, recreation, safety, etc…)?
  – Yes, multiple objectives can and must be integrated
  – No, it doesn't happen without compromise
  – Public safety shouldn’t be compromised
    • Levee are one “tool” in risk management and safety
    • Protection, environment, recreation (Grand Forks example)
    • Land development drives levee construction in most cases
    • Project purposes migrate
    • Habitat/environment improvement – must be collaboration early
    • There will be some losers (beyond compromise)

• Other Topics
  – Bring resource agencies into the circle early
    • Speed up the process, get solutions faster
    • Environmental concerns aren't going away – bring environmental groups onboard early
  – Levee reliability can have a national impact (i.e. New Orleans)
  – Technical standards need to be forward leaning
    • Updated regularly
    • Include risk in O&M standards
  – The legacy effect of Economic driven approaches to safety and risks