

Dam Safety Emergency Exercises

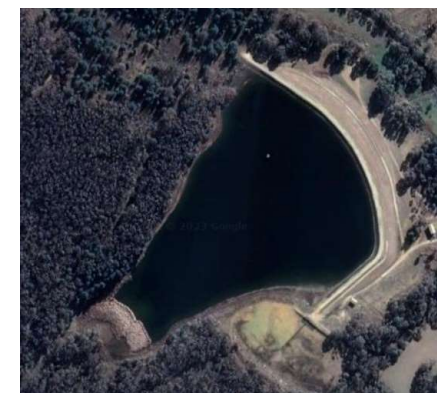
Dam Safety NSW Forum – 23rd June 2023



WaterNSW

Delivers water when and where it matters

- We operate the state's rivers and water supply systems in accordance with the rules set out by regulators
- With more than 40 dams across the state, we supply two-thirds of water used in NSW to regional towns, irrigators, Sydney Water Corporation and local water utilities
- We also own and operate the largest surface and groundwater monitoring network in the southern hemisphere and build, maintain and operate essential infrastructure.



Dam Safety Emergency Exercises



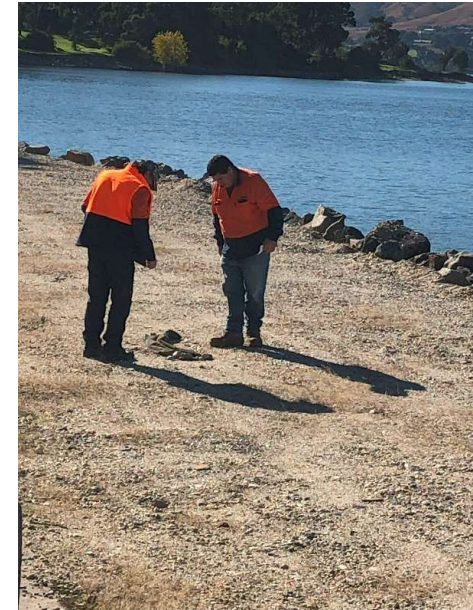
- Overview
- Types of Exercises
- Planning and Preparation
- Exercise Delivery
- Stakeholder Engagement
- Post Exercise, Outcomes and Lessons Learned
- Example Exercises



Dam Safety Emergency Exercises

Overview

- Why WaterNSW Hold Dam Safety Exercises
 - Regulatory Requirement
 - **Emergency Preparedness** Capability Development
 - Familiarity with Emergency Plans
 - Confirm **Communication** Methods and Protocols
 - Identify Potential Gaps
 - Exercise the Wider Organisational Response
 - Develop **Stakeholder Relationships**



Dam Safety Emergency Exercises

Types of Exercises

- Desktop Exercise – Half Day to Full Day
 - **Classroom** Type Setting
 - **Talk Through** Plans and Actions
 - Can Accommodate Multiple Complex Scenarios
 - Capture Input from Multiple Stakeholders and Agencies



Dam Safety Emergency Exercises

Types of Exercises

- Practical Exercise – Full Day
 - **Hands On**
 - **Practical Activity** – Surveillance, Mitigation Actions
 - Conducted in Near to **Real Time**, under **Real World Conditions**
 - Plan for the Expected Storage and Ambient Conditions on the Exercise Day



Dam Safety Emergency Exercises

Planning and Preparation



- Identify the Basic Exercise Parameters:
 - Type - Practical or Desktop
 - Attendees – Facilitators, Participants, Observers
 - Target Outcomes and Records
- Identify a **Credible Failure Mode** for the Exercise Dam
 - Dam Safety Risk Assessment or Dam Safety Specialist
- Build a Scenario around the Evolution of that **Credible Failure Mode**

Dam Safety Emergency Exercises

Planning and Preparation

- Scenario Development:
 - Initial Driver
 - Visual Indicators
 - Telemetry/Instrumentation Indicators
 - Develop Scenario **Artifacts/Injects** to Simulate the Evolution of the Failure Mode
- Define Roles and Responsibilities – **Facilitators, Participants, Observers** etc
- Define any Limitations or Constraints – Offsite Participants etc



Toonumbar Dam Inject 1 – Seepage Point 8



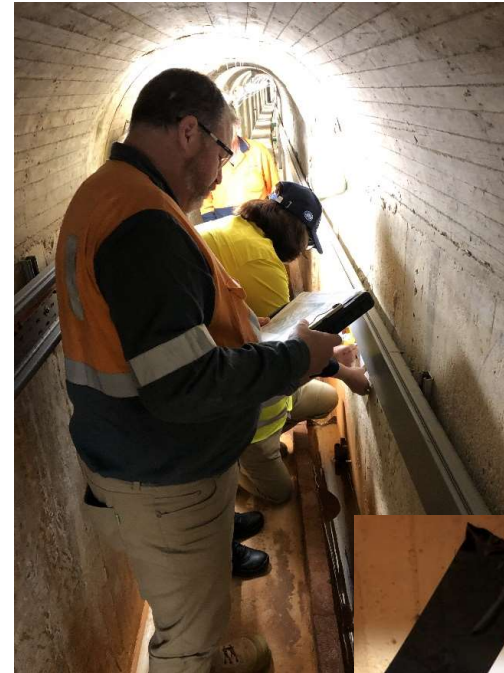
Instrument	Previous Reading	NOW
Seepage Point 8	0L/sec	0.4L/sec – Cloudy

WaterNSW Dam Safety – Exercise Material – Do Not Remove – 7th June 2023

Dam Safety Emergency Exercises

Exercise Delivery

- Practical Exercise – Pre-Position Exercise Artifacts/Injects for a (Afternoon Before or Morning of the Exercise)
- **Exercise Brief** and **Safety Brief**
- Background Conditions and Initiating Event
- Facilitate as Needed
- Record Key Events/Observations



Dam Safety Emergency Exercises

Stakeholder Engagement

- Determine **Stakeholder Expectations** and Management
- Desktop Exercise
 - Participation, Execution of Role within the Emergency Response
 - Familiarisation with Emergency Plans and Preparedness
- Practical Exercise
 - Site Familiarisation
 - Better Understanding of Operational Constraints and Challenges



Dam Safety Emergency Exercises

Post Exercise, Outcomes and Lessons Learned

- Hot Debrief / Wash-Up – Capture Immediate Reactions and Thoughts
- **Back Brief the Scenario**
- Record Observations, Gaps, Improvements, and Lessons Learned
- Post Exercise Survey – Additional Thoughts and Ideas
- Exercise Report, and **Assign any Actions**



Dam Safety Emergency Exercises



Example Exercises

Warragamba Dam

Desktop and Practical

- Desktop Exercise November 2021
- Practical Exercise September 2022

- Potential Gaps Identified through the Desktop Exercise were Addressed and Tested in the Practical Exercise



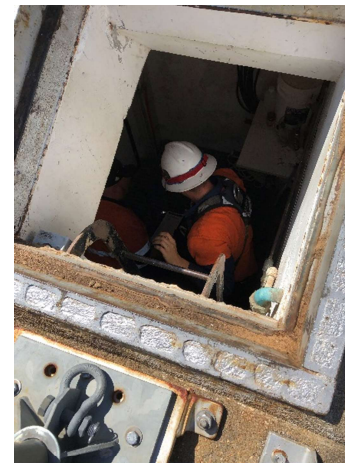
Dam Safety Emergency Exercises

Example Exercises

Burrendong Dam

Desktop and Practical – November 2021

- Day 1 - Desktop Exercise with Dubbo LEMC
- Day 2 – Practical Exercise at Burrendong Dam
- Same Scenario for Both Sessions
- Multi-Agency and Site Level Engagement



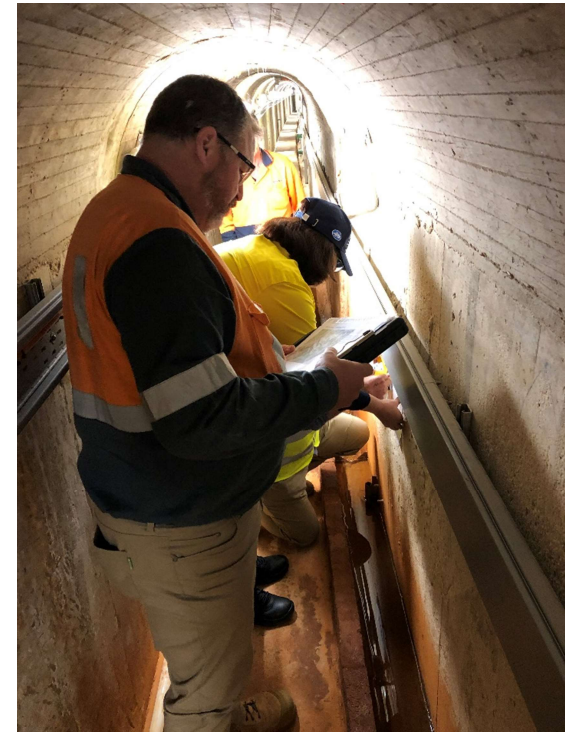
Dam Safety Emergency Exercises

Example Exercises

Upper Nepean Multi-Dam Exercise

Practical – August 2022

- Simulated a Seismic Event Impacting Cataract, Cordeaux, and Woronora Dams



Dam Safety Emergency Exercises

Key Take-Away Points



- Desktop Exercises are **Discussion Based**
- Practical Exercises are **Hands-On**
- For the Best Outcomes and Realism, Build your Scenario around a **Credible Failure Mode** Specific to the Dam
- **Assign** Post Exercise **Actions**



Thank you