

DSEPs & TRAINING

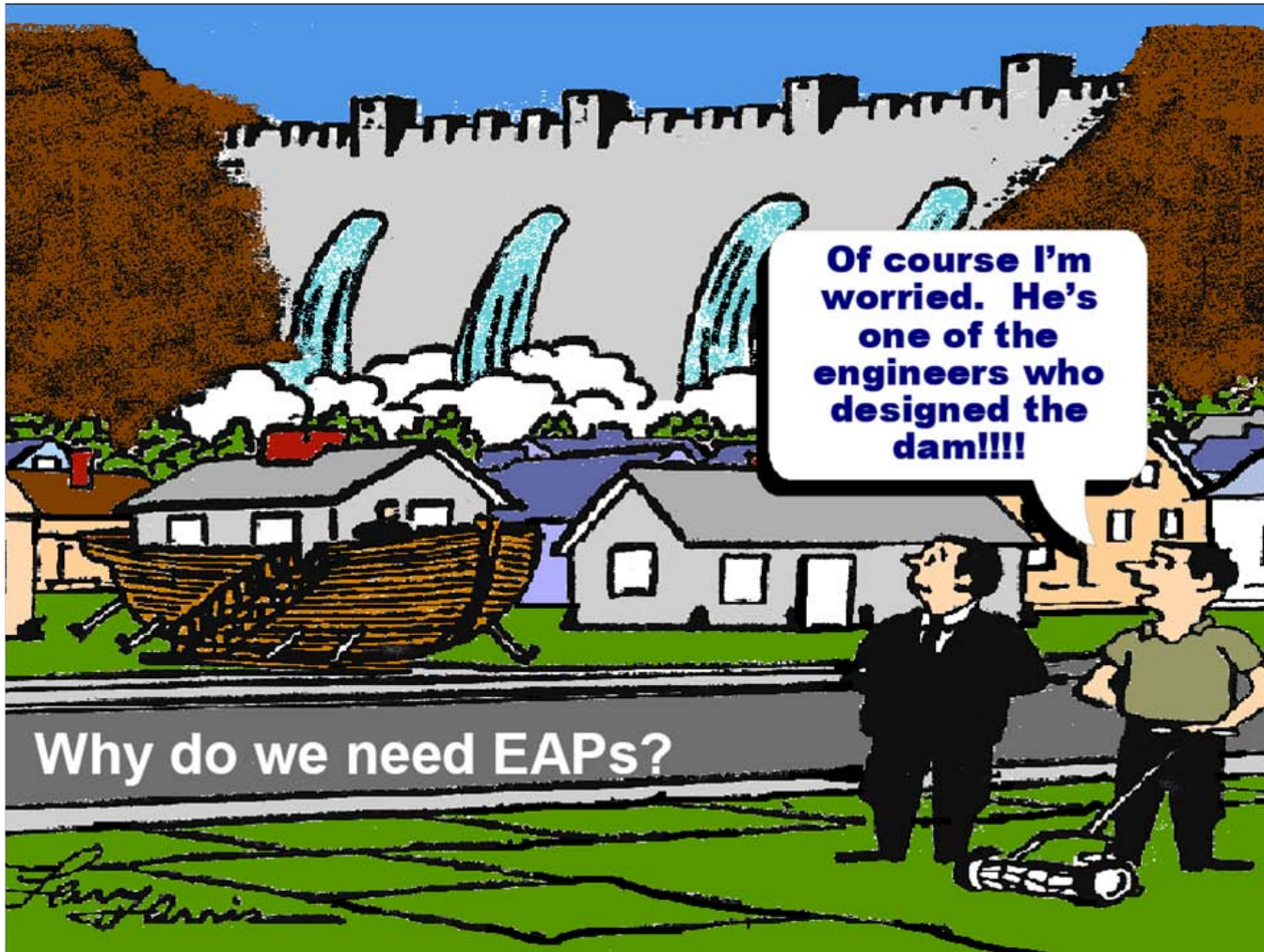
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Background

- STANDARDS USED FOR DESIGN, CONSTRUCTION, O&M AND SURVEILLANCE OF DAMS ENDEAVOUR TO MINIMISE RISK OF DAM FAILURE.
- UNUSUAL EVENTS OR ACTIONS COULD STILL RESULT IN DAM FAILURE OR DAMAGING STORAGE RELEASES.
- PRUDENT FOR DAM OWNERS TO IDENTIFY POTENTIAL EMERGENCY SITUATIONS & PLAN TO MITIGATE EFFECTS

OLD JOKE



DSC Requirement

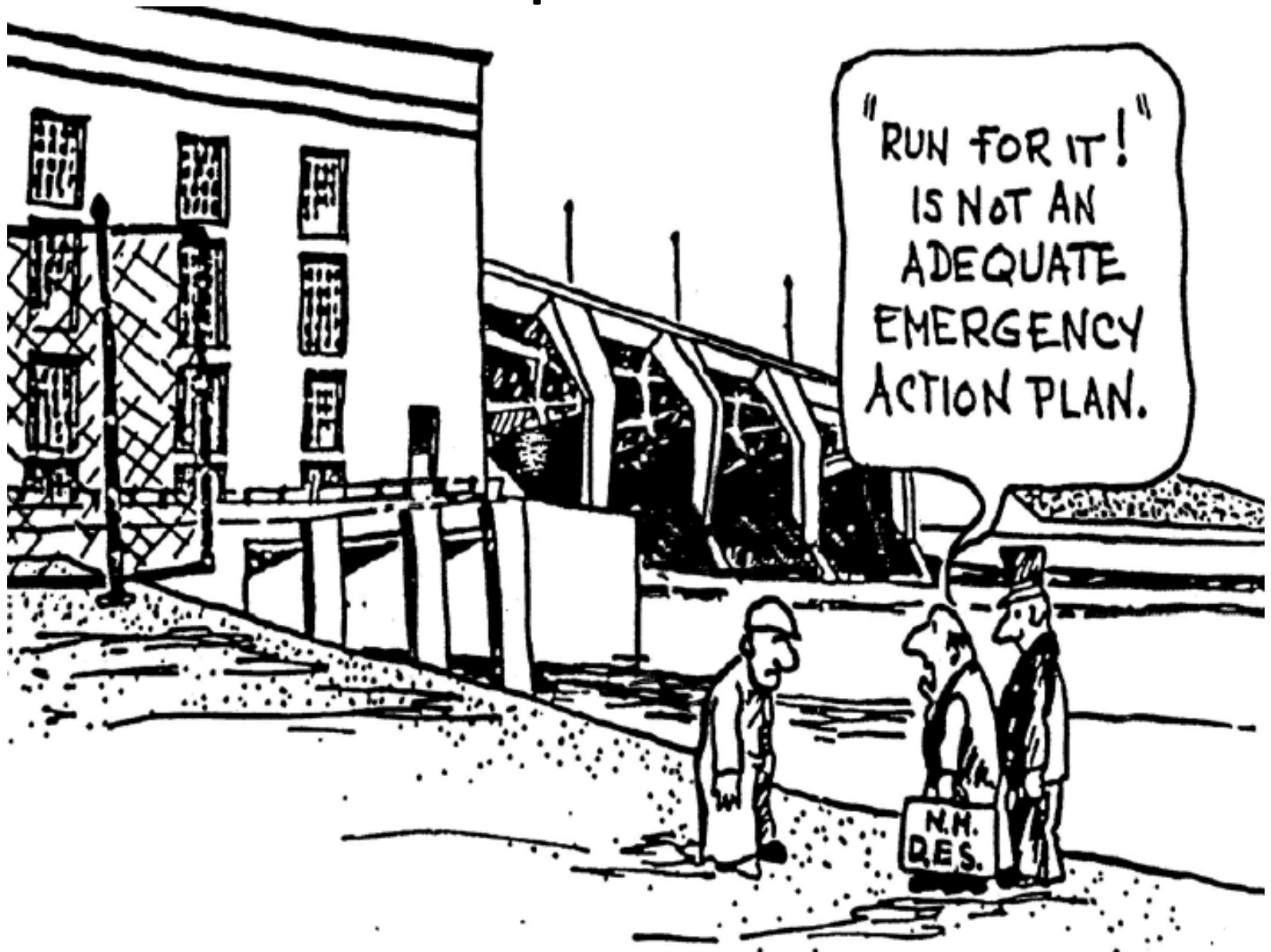
- Dambreak studies required where
- loss of life or significant threat to
- community interests could result
- from dam failure
- • A quality controlled Dam Safety
- Emergency Plan (DSEP) is required
- for dams where persons may be at
- risk if the dam failed

Emergency Plan Types

Two types of Emergency Plans
are required in NSW

- A Dam Safety Emergency Plan (DSEP) developed by the dam owner.
- A separate Flood Emergency Plan developed by the SES to provide protection for downstream communities in emergency situations.

Inadequate DSEP



SES has to deal with this



DSEPs

- Are site and owner specific
- Are required for all significant & higher consequence category dams.
- Identify conditions that could endanger dams & require action.
- Prescribe procedures to be followed by dam personnel to mitigate emergency conditions.
- Specify notification protocols to emergency authorities for their implementation of timely protective measures downstream.

SES Involvement

- Dam owners must consult SES State Headquarters during DSEP preparation (see Appendix B for helpful checklist) and provide SES
- with relevant dambreak information

SES Responsibility

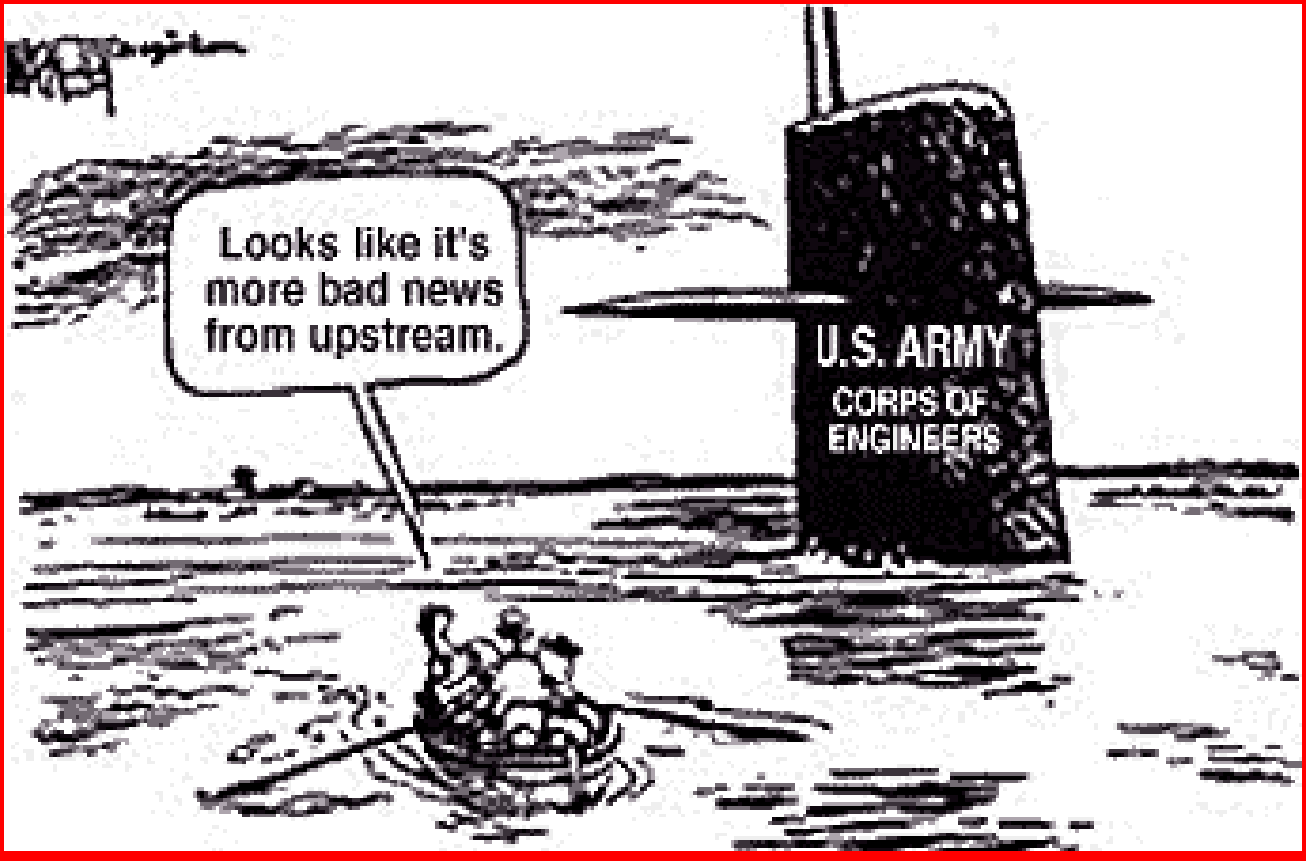


Campground Warning Sign



DSC 2G

- Owner initiates DSEP formulation or review
- 2. Owner consults with SES
- 3. Owner drafts DSEP and forwards to DSC for review/audit
- 4. DSC reviews and sends comments to owner for revision
- 5. Owner revises DSEP and sends to SES to review emergency contact arrangements
- 6. SES reviews draft DSEP and sends comments to owner
- 7. Owner revises DSEP and sends to DSC for endorsement
- 8. Owner distributes DSEP after DSC endorsement



Looks like it's more bad news from upstream.

U.S. ARMY
CORPS OF ENGINEERS

Owners Responsibility

Dam owners must:

1. Develop and maintain a DSEP for significant and higher consequence category dams. Their preparation requires careful research and coordinated planning.
2. Determine emergency forewarning conditions for their dams and mitigating actions to be taken.
3. Determine indicative downstream inundation effects for relevant floods through their dams (ie levels, extent, timing).

Owner's Inspector MUST Recognise and Report Failure Indicators



Note water flowing from other smaller flow concentration

Owners 2

4. Identify and establish a communication system (with back-ups) and timetable for timely and updated warnings to emergency authorities of impending emergencies.
5. Provide emergency authorities with details of owner's response actions and downstream effects (ie levels, timing).

Owners 3

6. Identify resources, equipment, access etc required in emergencies.
7. Ensure adequately trained personnel available to act in emergencies.
8. Identify and co-ordinate DSEP development with all parties involved.

Communications are VITAL



Owners Actions can save dam

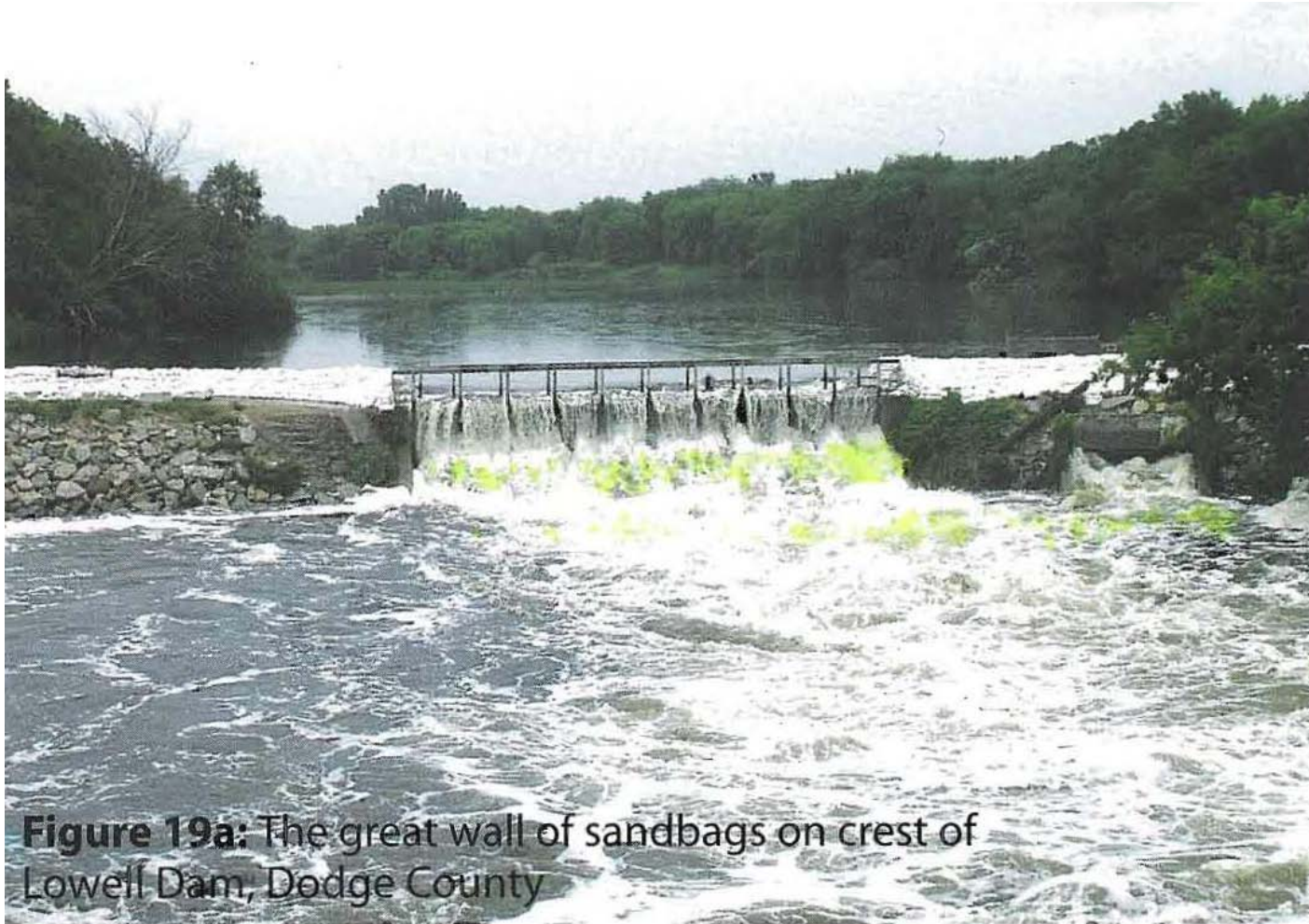


Figure 19a: The great wall of sandbags on crest of Lowell Dam, Dodge County

Sandbags by owners



They got it EARLY



Owner can open the gates



Baldwin Hills

California - December 14, 1963

Damages: > \$21 million

Fatalities: 5



Owners 4

9. Develop draft DSEP and notification flowcharts.
10. Hold meetings, get comments on draft DSEP (incl. DSC & SES).
11. Revise & disseminate control copies as “Interim DSEP”
12. Test and revise DSEP at regular intervals (ie update contacts annually, test five yearly)- becomes dated version of DSEP after first trial.
13. Report on DSEP performance in Surveillance Reports

Regularly TEST the plans

Emergency Action Plan Exercises

- Tabletop exercise every 3 years
- Functional exercise every 6 years



DSEP Contents

1. Introduction
 - Title
 - Purpose Statement
 - Notification Flowchart
2. Responsibilities
 - Surveillance and O&M
 - DSEP Implementation
3. Emergency Identification
 - Surveillance Triggers
 - Action Procedures

Emergency Identification



Contents

4. Notification

- Who
- Priority
- Planning

5. Attendance/Communication Procedures

- Monitoring
- Warning Systems
- Access
- Communication

Contents

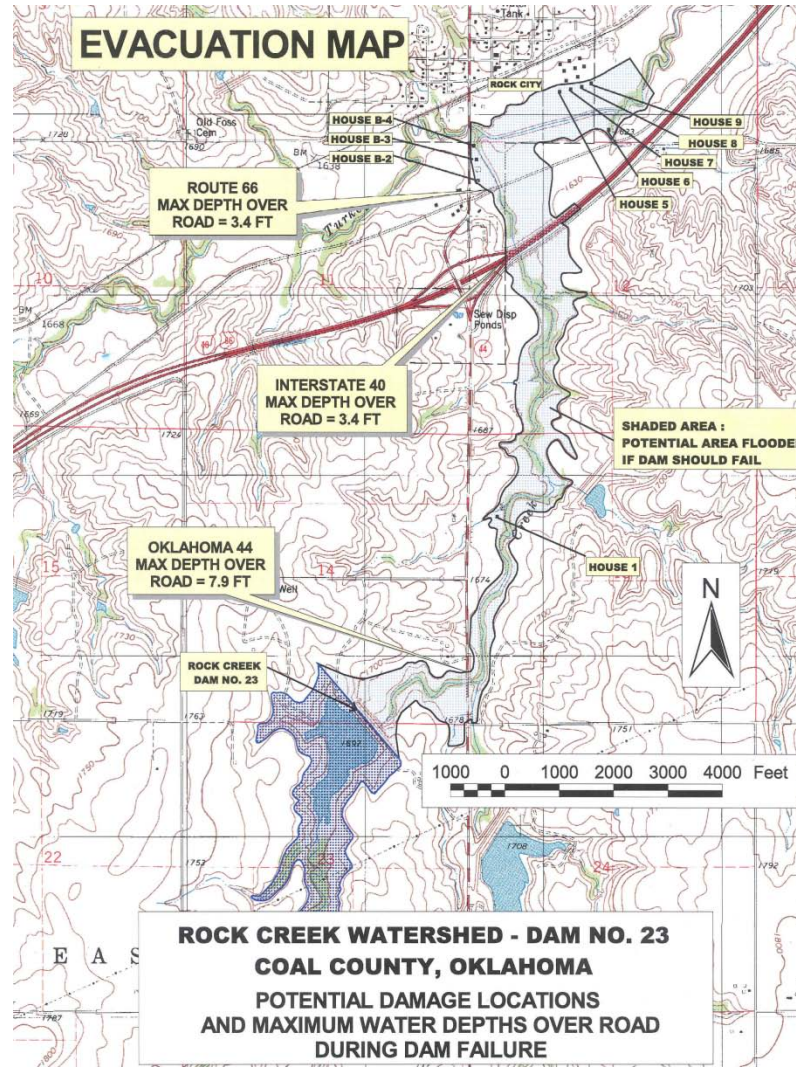
6. Inundation Mapping

- Extent
- Timing
- Depths
- Velocities

7. Preventative Actions

- Detection
- Operational Aspects
- Adverse Time Response
- Emergency Needs
- Co-ordination

Inundation Map



Contents

8. Appendices

- Dam Location / Description
- Flooding Background Info
- Emergency Event Recording
- DSEP Training
- DSEP Review / Update

Alerts

- Dam failure alerts (white, amber and red) are
- used to trigger emergency response actions.
- • White-defect noted or heavy rain-preliminary
- alert-SES notified and check readiness
- • Amber-failure possible if continues-SES
- warns PAR to prepare to evacuate-SES
- Evacuation Warning
- • Red-failure imminent-PAR evacuated by
- SES-SES Evacuation Order

Avoid “Too Early” Alerts



Very Small Alert Time



Alert Triggers

- High and Extreme Consequence dams are to
- have telemetered storage level monitoring
- (and preferably rainfall and seepage as well)
- High and Extreme Consequence basins are
- to have telemetered monitoring of rainfall nearby
- New High and Extreme Consequence dams
- are to have telemetered seepage/tailwater Monitoring.

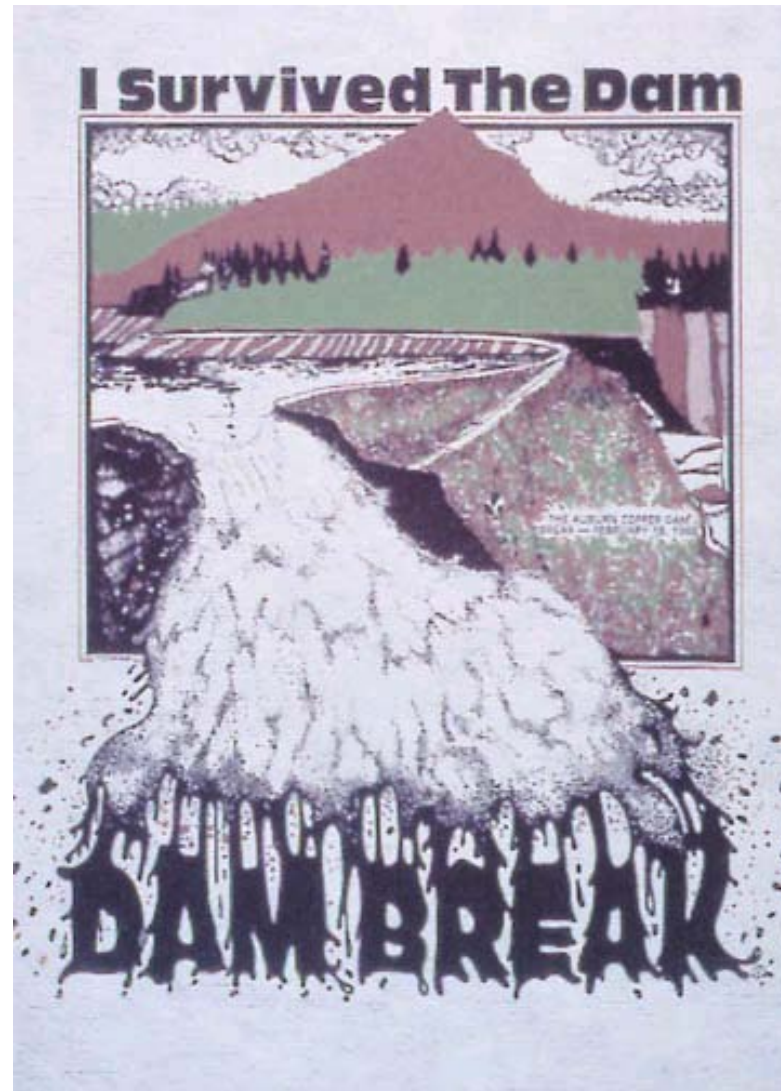
Ensure Trigger System Works as Designed



Trigger Went off Late!



If all else fails buy the T-shirt



TRAINING

- Training by PWD began in 1991 (at Coffs H)
- Resulted from lack of knowledge of dam operators in dam inspections
- Since then nearly 40 courses been run by PWD with assistance of DSC
- Over 1200 operators been trained
- To date courses have been SEMI-formal (accredited but not run through RTO)

Training Course Practical inspection



Why Training

- Inspectors MUST be able to recognise failure indicators
- They MUST know who to report to and who they can rely on in emergency
- Early recognition of problems can result in repairs which stop progression to failure
- Build up a RECORD of the dams physical state with time so that change indicators can be picked up

Training/DSEP

- DSEPs success depends on owner being able to get a warning to the SES
- AND
- Inspectors ability to communicate problems through EARLY recognition of indicators

At Present

- 2 Types of Courses
- TAFE accredited :- gives 4 units towards Certificate III of Water Operators Course
- Will involve more in-depth assessment but will allow Certificate holder to work on any dam as qualified inspector
- Non TAFE (as per existing) NO CHANGE
-

NEXT COURSES

- 2 in NOVEMBER 2012 at Port Macquarie
- 2 in FEBRUARY (/MARCH?) 2013 probably at Port Macquarie

DSC REQUIREMENT

- DSC still requires operators to be trained and to have refreshers at 5 year intervals
- DSC does NOT insist on operators having the TAFE endorsed certificate (YET)
- DSC administers the courses since I left NOW

COMMERCIAL

- What can PWD Dams & Civil do for Council?
- (For a fee)
 1. Inspection of dams (annual audit and specials)
 2. Prepare Surveillance reports
 3. Preparation of DSEPs. Provide Technical advice during emergency, Testing of DSEPs
 4. Risk Assessments/ dambreak studies /LOL
 5. Design of new dams and upgrades of at risk dams
 6. Instrumentation Review
 7. O&M Manuals

Yibbity Yibbita.....

