

ASDSO Annual Survey of State Dam Safety Program Changes and Survey of Liability and Insurance Issues, 1994-1995

1. What has your state done this past year to promote public awareness of dam safety?

Nothing or no response: AL, CT, DE, KS

Interviews with media/news releases: GA, ID (news releases prior to Spring runoff & responses to media inquiries), IL (In conjunction with "Dateline" broadcast, information & taped interviews were coordinated with local broadcast affiliates.), IN, MI (2 regarding "Dateline" presentations), MS (after "Dateline")

Emergency Preparedness Exercises: CO

Public awareness seminars: AK, AR, HI, MA, MT

- AK: A public awareness seminar was held in Fairbanks in conjunction with the Alaska Miners Association on the design of sedimentation pond dams and tailings dams.
- AR: Held 3 Public Awareness Workshops with emphasis on Maintenance and Operation of Dams.
- MT: Held public awareness workshop in Feb for dam owners, engineers, and other governments owning or regulating dams in MT

Meetings with dam owners: IN, KY, MS, MT

Other dam safety conferences/workshops:

- AZ - sponsored part of Governor's Flood symposium/AZ Floodplain Mgrs Assn seminar.
- GA - Hosted ASDSO Annual Conference
- LA - Participated in annual LA Floodplain Mgmt Assn Conf in April 1995, Alexandria, LA. Our presentation was on Dam Safety Program and its correlation with CRS credits.
- MA: Attended several related conferences
- MI: Held 3rd annual FEMA/ASDSO/MDNR-sponsored workshop
- MT: Held ASDSO West Regional Conference in May
- NH: Six "Dam Operations & Maintenance" workshops conducted in different areas of state.

Distribution of brochures, display, booths, etc.:

HI

IN (state fair model)

KY (distributed TADS How to Develop EAPs to owners of high hazard dams; Responsibility & Liability brochure to owners)

NE: Dam Ownership - Responsibility & Liability brochure sent to owners of high hazard dams

Other:

ME: Compiling safety information and coordinating state agency input for periodic mailings to private dam owners

MN: Promoted & acquired dam safety funding for dam repairs at the legislature, removed 3 unsafe dams, provided program information to the public

NE: Developing an information card for dam owners which gives information on dam safety and maintenance.

NV: Worked on revisions to dam publication to be sent to interested parties (See #7). Will hold 2-day dam seminar in Oct. in Lake Tahoe & will hold ASDSO Western Regional Meeting in Spring '96.

2. List staff increases, decreases of changes.

None: AL, AK, AR, CO, DE, GA, HI, ID, IN, KS, ME, MD, MI, MN, MO, MT, NV

Increase:

- AZ - One division engineer reassigned from other duties to Safety of Dams.

- LA – Two Engineers-in-Training were added to the Dam Safety staff during the year.
- Ma – One staff increase (effective Sept.)

Decrease:

- CT – We (Inland Water Resources Division) lost one position this past year (Environmental analyst III). This individual was transferred to a newly created Enforcement Section.
- MS – Lost one position
- NE – Dennis Hurtz will be taking over as Chief of the Engineering Division for the NE Dept of Water Resources on Aug 14, 1995. The position has been changed from full-time to permanent part-time.
- NH: Lost one engineer due to statewide budget cut.

Change:

- IL: The dam safety responsibilities have been revised to reflect geographical portions of the state rather than the previous functional separation. The IL DNR, Office of Water Resources, Div of Resource Mgmt contains the 2 sections responsible for dam safety. One of the sections covers the 6 counties in the Chicago area. The other section covers the remainder of the state. The dam safety responsibilities have been combined with the regulation of floodways and public waters in these sections. The FTE staff for dam safety in the 2 sections has not changed.
- KY: Filled a vacant engineering position which was vacant for over a year. One engineering technician left, leaving a vacancy which is currently not filled.

3. Summarize any new or amended legislation on dam safety or pertaining to owner or state personnel liability (since Sept 1994). Is there any legislation pending or about to be introduced?

None: AL, AK, AZ, AR, CO, CT, DE, HI, IL*, IN, KS, KY, ME, MI, MS, MO, MT, NV, NH

GA: The exemption for PL566 dams, watershed dams were extended to Nov 1, 2000 as long as money is appropriated to upgrade existing dams to GA Safe Act standards annually.

ID: Safety of Dams statutes amended – state may issue deficiency warrants for costs incurred for remedial work during a dam emergency.

*IL: No new or amended legislation was introduced. The creation of the DNR within the state will require the introduction of amendatory legislation to revise the authorities give to previous agencies to the new DNR.

LA: The formal promulgation of the LA Dam Safety Rules & Regulations is required by Act 1049 of the 1995 Regular Session of the LA Legislature. The LA Dam Safety Rules & Regs have been inexistence within the DOT & Development since 1981.

MD: The Dam Safety Division and its statutory authority has been reassigned to the Department of the Environment.

MA: New legislation pending

MN: Statutes now authorize 100% state funding for removing dams.

NE: LB 309 passed in May 1995. The size and storage requirements for dams to fall under DWR's jurisdiction are now the same as the requirements used for including dams on the dam inventory. LB 309 also allows DWR to waive the requirement for an outlet works for waste confinement dams.

4. Summarize changes in rules and regulations.

CT: The department is in the process of promulgating administrative regulations for the adoption of a General Permit for dam maintenance and repair. This permit will allow for dam owners to apply for

coverage (under the permit) and be quickly granted authorization for a number of predetermined dam maintenance and repair activities.

IL: None yet, although these too will have to be revised to reflect the creation of the DNR.

MD: We are still attempting to modify the regulations to require inspections of high and significant dams by P.E.s and to establish safety criteria for existing dams.

MS: New and better regulations were adopted by our Commission in Dec 1994, giving us better authority in regulating our High Hazard dams.

MO: As a result of a court ruling, all fiscal notes pertaining to MO Dam Safety Rules & Regulations had to be rewritten and filed with the Secretary of State's Office by Aug 1995. Ruling was based on the finding that previous fiscal notes were done improperly. Failure to rewrite fiscal notes could have resulted in rules and regulations being declared invalid.

MT: Allowed existing dams to be permitted if the spillway capacity & reservoir can route the 500 year inflow until risk-based standards can be adopted.

NE: DWR can waive the requirement for an outlet works for waste confinement dams.

5. Briefly describe any lawsuits initiated against dam safety personnel and the results of such litigation that have occurred over the past year.

None: AL, AK, AZ, AR, CO, CT, DE, GA, HI, ID, IL, IN, KS, KY, LA, ME, MD, MA, MI, MN, MS, MO, MT, NE, NV, NH

6. Please list any insurance carriers insuring dams in your state.

None: LA

Not tracked/unknown: AL, AZ, AR, CT, DE, GA, KS, KY, ME, MD, MN, MS, MO, NE, NV, NH

AZ: Not aware of changes to previously submitted data.

AK: CIGNA

CO: No change

HI: The State of HI is self-insured of dams in the state which re under the State's jurisdiction. Private dams are insured by the private owner's insurance carrier.

ID: Penco/Hartford, Sedgwick-James, Stein-McMurray

IL: Bliss-McKnight Agency, Bloomington, IL insures local government entities for the liability that the dam creates through the Governmental Inter-Insurance Exchange, a reciprocal insurer. The dam itself is not insured. The agency works primarily in IL, IN, MO, and KY.

IN: Bliss-McKnight

MA: None in state specifically for dams

MI: Meadowbrook Insurance Co., Southfield, MI [810-358-1100]

MT: Hoiness-LaBar Insurance

NV: Individual dam owners are responsible for their own insurance.

7. Please describe any other activities or actions that have taken place in the last year that may be of interest to other states.

AR: After the national airing of dam safety on television, we were asked to be on 2 state TV news segments describing the State Dam Safety Program.

CO: FERC cooperative agreement*, extreme precipitation study*, long-term plan-mitigating dam failure flooding* (*attached)

CT: The DEP is preparing to breach a dam owned by an assetless out-of-state corporation in the town of Stafford (Orcutt's Pond Dam). This action has precipitated a great deal of interest with local historians, environmentalists, etc. However, the department has to date been unable to interest the town in participating in a joint state/local cooperative repair.

GA: GA has appropriated \$2.4 million to upgrade PL566 dams to meet the requirements of the Safe Dams Act & Rules for Dam Safety. \$200,000 is for maintenance and \$2.2 million for structural upgrades (spillway enlargement). Design for repairs of two dams are underway to NRCS. This is being done by the NRCS office in TN. This activity is applicable only to high-hazard PL566 dams.

Repair of government owned dams that failed during the 1994 flood continues. FEMA and the State of GA funds the upgrade and repair of these dams under the public assistance portion of the disaster relief effort. The dams are upgraded to the standards of the Georgia Safe Dams Act, except for spillway capacity to mitigate the chance of future failure. Water Supply Dams are upgraded to the standards of the Safe Dams Act, including spillway capacity. This has been one of the prime examples of mitigation efforts carried out by FEMA and the State of GA.

IN: The \$5 million reconstruction project for Sylvan Lake Dam in N. IN continues with the expected completion in late 1995.

KY: Upgrade to the emergency spillway at Guist Creek Dam in Shelby County. The spillway is being upgraded to pass the flood resulting from 1/2 the PMP. An incremental damage assessment helped determine the design storm. Due to site constraints, a labyrinth spillway design was chosen. Physical model studies were used to optimize the design of the spillway and approach channel. Spillway construction began in Oct 1994. Completion is expected in early 1996.

LA: Legislation was introduced & swiftly passed the House that would have targeted the state's Dam Safety Program for severe reduction in regulatory authority. With the assistance of Lori Spragens, ASDSO Executive Director, we were able to reach a compromise that left the program intact.

MA: Increase in available capital funds (to \$2M) for inspections, repairs, etc.

MN: Two dams on Mississippi River being modified by adding rubber dams to replace tainter gates and flashboards. Also, dam owners are looking more favorably at removing dysfunctional dams.

MO: Agreements have been reached on how the height of coal surface mining reclamation project dams (built in a pit) would be measured.

NV: A publication entitled "Laws & Permitting Information Pertaining to Dams" for the state of Nevada has been updated & sent to print. Final print will be available around Aug. 1, 1995. The publication was last updated in 1970.

NH: A part-time engineer was hired by the State to establish EAPs for state-owned dams.

8. Please list and describe any dam failure or incidents of note.

None: AL, AK, AZ, AR, CT, DE, IN, KS, ME, MD, MA, MN, NH

CO: Attached

GA-1: Lake Joy Dam in Houston County. Piping along the principal spillway conduit. This dam was repaired by Houston County after it was overtopped by the flood in 1994. The county repaired it again with advice reportedly from NRCS.

HI-2: In Nov 1993 a recently constructed Waimanalo 60 MG Reservoir suffered a longitudinal slippage of the downstream embankment due to excessive and continuous rains. Costs to repair the slippage amounted to \$450,000.

In Dec 1991 the Kapaa-Kealia-Anahola area recorded rainfall of approximately 20 inches, causing extensive flooding and slides. Although flooding subsided in the lower Kealia flats by 2pm, water from Kapaa Stream and runoff water continued to flow into the Lower Kapahi Reservoir, causing overtopping of the dam. The outlet gate was found to be only partially open and lodged against the outlet structure. A special hook was made and attached to a crane which then removed the outlet gate. Upon removal of the gate, there was an immediate surge in the discharge and the water level dropped. Lihue Plantation Co. repaired the damages to the embankment caused by the overtopping.

ID-2: Small (less than 20 ac-ft) low hazard, municipal dam failed, Feb 1995. Remedial work in April prevented embankment failure of a 600 ac-ft water storage dam.

IL-2: In Jan 1995, Pine Lake Dam developed a 6-ft diameter hole about 6 ft deep in the crest of its embankment just left of the overflow spillway. The lake was drawn down and repairs have been completed. In May 1995, a slough of the downstream face of Lake Jaycee Dam occurred. The slough impacted the crest of the embankment for a distance of approximately 150 ft along its length, dropping the downstream portion of the crest about 5 ft. The lake has been drawn down and analysis of the problem and probable dam modifications are ongoing. Both incidents have been reported to the Center on the Performance of Dams.

KY-2: (1) Dam safety personnel provided assistance with draining of a small high-hazard surface mining impoundment. Dept for Surface Mining is coordinating repairs. Due to slides and erosion, the integrity of the embankment was uncertain. (2) Dam safety personnel inspected a small high hazard impoundment which was experiencing an increase in leakage. The owner carried out our order to partially drain the lake. The owner's engineer is evaluating alternatives for repair or removal.

LA-1: Pepper Ridge Subdivision Dam was overtopped on Apr 23, 1995, following an uncommonly heavy rainfall. Despite the relatively small size of the impoundment, properties in the path of the breachwave crest sustained significant damage.

MI-1: Barnes Dam, MI #00109, failed on May 29, the result of a very intense storm. Minor damage occurred.

MS-2 failures; 1 incident:

- Two high hazard dams failed due to piping along outlet works. They were slow failures and nobody was hurt. Both failures were the result of improper compaction around pipes.
- Underseepage on a new 50' high dam (high hazard) caused considerable concern upon first filling. The lake level was lowered and remedial work was done along the toe to control material removal. Engineers are still trying to determine what is causing the problem.

MT - No failures; 1 incident: Imposed reservoir level restrictions on Upper Glaston Lakes because of high pore pressures in the foundation.

NE – 2 incidents:

- In Feb 1995, DWR personnel observed the breaching of an illegal dam in Nance County. The dam, which was about 34 ft high and provided about 1250 ac-ft of storage, would have failed eventually due to an improper design.
- In June 1995, DWR personnel observed the breaching of a dam just northwest of Lincoln. It was designed and constructed as a low hazard dam in the 1940s. The downstream area had since been developed so the dam was reclassified as unsafe high hazard dam. The dam was breached to drain the reservoir while the dam is modified to be an overflow structure with a reduced storage capacity that will not pose a potential threat to the downstream area.

NV - 1 failure; several minor incidents: Milk Ranch Dam, located 30 miles north of Reno, failed. It was an old earthen structure with a capacity of approximately 500 ac-ft. Cause of failure was heavy winter runoff combined with a thunderstorm and failed outlets. Because of the extremely long and wet winter, there have been many "minor" incidents on high elevation, earthen dams.

NC-18:

- Small dam failure in Yancy County, Jan '95 - heavy rains
- Small dam failure in Buncombe County, Jan '95 - heavy rains
- 2 large water supply dams in Buncombe County (Bee Tree Dam and North Fork Dam) opened flood gates during heavy rains of January '95. increasing downstream flood levels.
- Windy Hill Dam, new dam in Chatham County, failed from piping during moderate rainstorm, March '95.
- Hogan Lake Dam. small low hazard dam in Anson County, failed March '95.
- Jaycees Dam. small low hazard dam in Cumberland County, failed from piping during heavy rain.
- Lake Lynn Dam, small low hazard exempt dam in Cumberland County, failed by overtopping during heavy rains in June '95.
- Moose Lodge Dam, small low hazard exempt dam in Cumberland County, failed by overtopping during heavy rains in June '95.
- A small low hazard exempt dam in Biaden County, failed by overtopping during heavy rains in June '95.
- Oceanview Swine Lagoon Dike, a 12-ft high 8-acre exempt Sine Lagoon Dike failed in Onslow County, discharging approximately 25 million gallons of swine waste into the New River in June '95 during heavy rains.
- Law Enforcement Dam, a small low hazard dam in Scotland County, failed by overtopping in June '95 during heavy rains. Beavers clogged spillway.
- An exempt swine lagoon in Sampson County failed in June '95 during heavy rains.
- Tate Dam, a high hazard dam in Rockingham County, nearly overtopped during heavy rains in June '95; emergency breach channel excavated on right end of dam.
- Wildwood Lake Dam, a small low hazard dam in Caswell County, failed in June '95 during heavy rains.
- Maready Poultry Lagoon Dike (small, exempt) failed in July '95, discharging 8 million gallons of poultry waste into nearby stream.
- Lancaster Dam, a small intermediate hazard exempt dam in Henderson County, failed in June '95 from overtopping during heavy rains.
- Reedy Swine Lagoon Dike, a small exempt swine lagoon dike, failed in Sampson County in July '95.

ND: On July 15, 1995, Appert Lake Dam in Emmons County failed as the result of a large rainfall event. The dam was 12 feet height and stored 1340 ac-ft of water. Minimal damage occurred to a state highway and downstream agricultural areas. The project is owned by the US Fish and Wildlife. OH - I: The State took emergency action at an eastern Ohio dam to prevent a dam failure. We took control of the property and installed a culvert to lower the lake level.

OR: Please see newsletter-June 23, 1995 (Ochoco Reservoir).

PA-4:

The Division of Dam Safety received a call from the Lock Haven City Engineer on 1/19 reporting the discovery of a large hole behind the spillway chute training wall at their Warren H. Ohi dam, a 59-ft high structure impounding approx 850 million gallons of water. The initial inspection confirmed the presence of a 3-ft diameter sinkhole along the wall. This hole extended to a depth of about 8 ft and extended under the wall footing. A significant flow of water could be heard at the bottom of the hole. The City was directed to lower the reservoir pool. On Feb 2, Div of Dam Safety staff accompanied by representatives of the Baltimore District Corps of Engineers returned to the site, the reservoir level was approximately 2 ft below spillway crest so that the entire spillway channel surface was dry. It was discovered that there had been a serious undermining of the spillway channel. Using a ladder, personnel were able to climb down and under the wall footer. With the water level in the reservoir reduced, there was no evidence offlowing water under the slab area. Close inspection of the spillway slabs indicated extensive cracking and settlement. Channel flows obviously passed through the cracks in the concrete and eroded the foundation. The City has hired an Engineer for a full investigation and report. The City has been directed to keep the water level 203 ft below normal pool and to make daily observations of the sinkhole area. Since June-July '94, a cluster of

piezometers at the City of Bethlehem's Penn Forest Dam, a 130 ft high earthfill dam. indicated an abrupt 25 ft drop in pore water pressures in foundation rock. The City implemented a staged lowering of the reservoir and is implementing an emergency work plan. Internal erosion of the embankment and foundation is suspected. The reservoir has been lowered 50 ft and additional drilling and instrumentation programs are underway. The City has convened a Board of Consultants for an investigation and evaluation.

An annual inspection of the Bameston Dam (SCS PA-432) revealed severe tilting of the standard SCS riser structure. PA-432 is a dry flood control structure with a bottom level outlet and trash rack. An inter-agency task force evaluated the failure and determined the cause to be severe debris blockage and erosion at the approach channel and foundation scour. The riser will be removed and replaced.

During a routine inspection of Marguerite Dam, a 20-ft high earthfill dam located in Westmoreland County, a quick condition at the toe of the dam near the outlet pipe, was detected. An administrative order was issued to drain and repair or breach the dam. The dam was drained and breached to render it incapable of impounding water. No detailed investigation was performed, with the drain valve located on the downstream end of the outlet, leakage and high pore pressures along the conduit were suspected. RI: No failures, but 3 dams are subject to major rehab work regarding gate control structures.

SD: Several small (all Cat. 3) failed with this spring's runoff. We had two 2-3 ft snowfalls in April.

Iroquois Dam (ID #2234) overtopping incident that was stopped and repaired before failure. TN - 2: Two structural failures (no release of water) on SCS dams. Beavers made a hole through one dam above waterline. Another dam had failure of DS 2 joints of PS conduit. Seepage through joint was cause. First was repaired - second is about to be.

TX -3: Three dams failed, all as a result of spillway failures. No lives were lost and no major damage occurred downstream. The dams that failed were:

1. Bearfoot Lake Dam -27 ft high-819 AF
2. Lake Tinkle Dam-20 ft high-189 AF
3. Cade Lake No. 3 Dam-20 ft high-300 AF

VA - I: One failure - Timberlake Dam (#VA 03102) on 6/22/95. Significant spillway damage to White Oak Dam (#VA 11301) and Izac Dam (#VA 10922).

WA - I: Sherry Lake Dam, failure of a small low hazard timber crib dam due to overtopping. There was no downstream damage.

WV - I: Cherry Lake Dam, Hancock County (northern panhandle) overtopped with erosion of the embankment on June 23. Dam did not fail.

WI - I: Total dike failure by overtopping of Ladysmith Hydro Dam on the Flambeau River, Sept. 94. Also lost by overtopping an earth dike which washed out a state highway.

WY-2:

The Spicer Upper Reservoir in Casper, WY was ordered breached when a large slump was discovered on the downstream face of the dam during the abnormally wet conditions that occurred this Spring. A highwall (at the Rawhide Mine) which forms part of the Cottonwood Reservoir embankment failed in July, causing a 50-ft deep several hundred ft long depression in a haul road built on the embankment. Reservoir was not immediately in danger as the crest width is over 200 feet. Embankment is being stabilized by dumping mine waste material along the highwall.