

Examples of dam failures caused by erosion

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Piping along outlets

Embankments



Piping along outlets

Embankments



Erosion of spillways

Embankments



Erosion of spillways

Embankments



Erosion of spillways

Embankments



Erosion of spillways

Embankments



Erosion of spillways

Concrete Dams



Erosion of spillways

Concrete Dams



Erosion of spillways

Concrete Dams



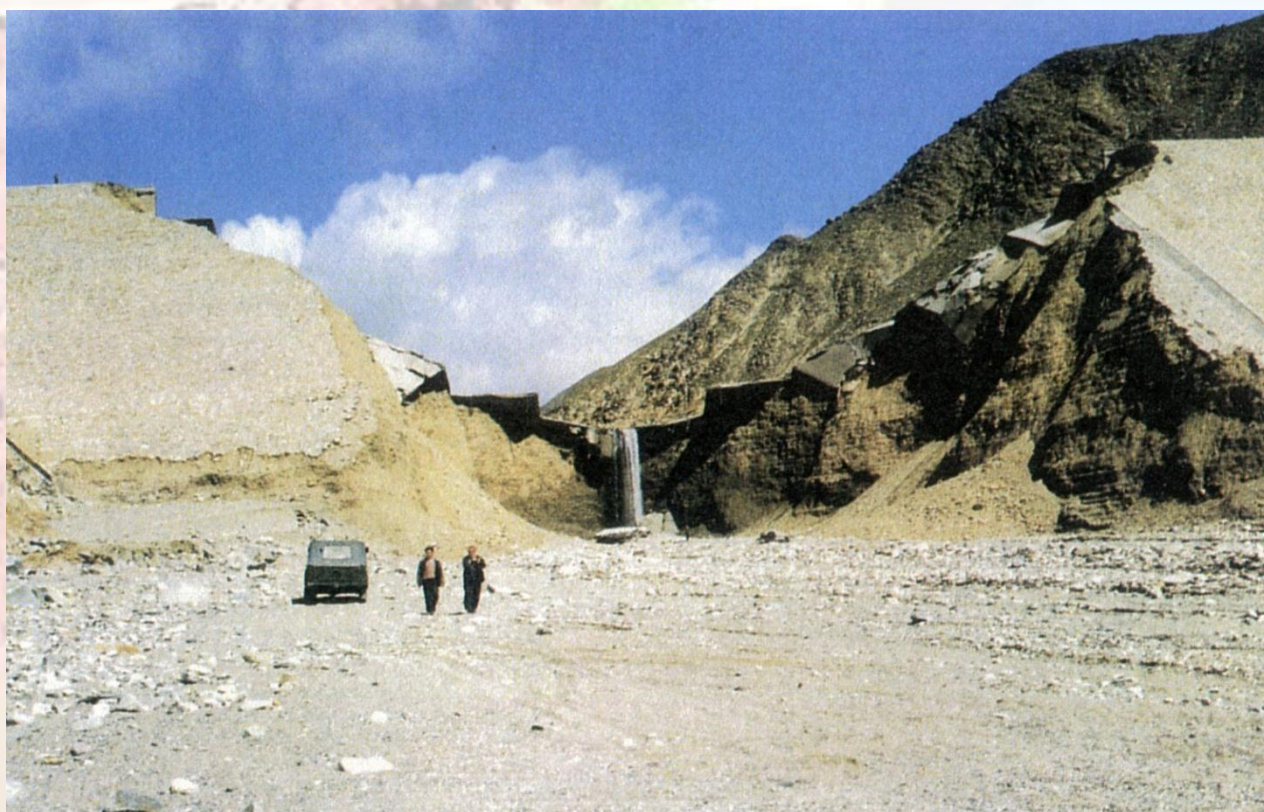
Erosion of spillways

Concrete Dams



Piping through dam bodies

CFRDs



Piping through dam bodies

Embankments



Piping through dam bodies

Embankments



Piping through dam bodies

Concrete Dams



Piping through abutments

Embankments



Piping through abutments

Concrete Dams



Piping through abutments

Concrete Dams



COMMISSION INTERNATIONALE
DES GRANDS BARRAGES

ASHLEY

Grundz. a. gleiche Ablesung. Zweckbauweise v. Pitts. 1888.

14.5 10.5 3.65 3.65 15.1 3.1


Auswaschung

Erste Fells Anfang 1808. Wegen heftiges Regen wurde
Kronen überflutet. - Jammeln. Tels mit Kisten.
Grund unregelmäßig in 2.4 bis 7.6 m Tiefe. Kisten.
Grund durchlöcherig. Nachmanus weiche nicht.
Durchgehend auf Tels. - Grundwiederaufbau nicht.
Dann Nachmanus aus Beton.


(*) *Le mécanisme de la rupture des Barrages.*

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Database of case studies of embankment dam failures and failures of masonry and concrete dams.




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Search for concrete & masonry dams

Dam name:

Country:

Date of construction since:

Date of failure since:

Height from:
(above natural ground)

to:

Length from:

to:

Age at failure from:

to:

Dam type:

- ☒ All
- ☒ Gravity dam (PG)
- ☒ Buttress dam (CB)
- ☒ Multiple arch dam (MV)
- ☒ Arch dam (VA)
- ☒ Unknown

Type of dam material:

- ☒ All
- ☒ Masonry
- ☒ Cyclopean concrete
- ☒ Concrete
- ☒ Roller compacted concrete
- ☒ Unknown

Failure mode:

- ☒ All
- ☒ Dam body
- ☒ Dam - foundation contact
- ☒ Foundation
- ☒ Unknown

Failure factors:

- ☒ All
- ☒ Design
- ☒ Construction
- ☒ Overflow loading
- ☒ Seismic loading
- ☒ Overflow erosion
- ☒ Pore pressure in the dam
- ☒ Pore pressure in the foundation
- ☒ Internal erosion in the foundation
- ☒ Faults in the foundation
- ☒ Foundation mechanical characteristics
- ☒ Unknown

Event that induced failure:

- ☒ All
- ☒ Seism
- ☒ Flood
- ☒ First filling
- ☒ Upstream dam break
- ☒ War
- ☒ Unknown

Storage of knowledge



Experience gained from incidents on dams should be brought to the knowledge of the engineering world. They teach valuable lessons for further surveillance, maintenance and construction of dams.

Eduard Gruner (1905-1984)



**Thank you
for your
attention**





Failure Rates of Dams in the Western World

DAM TYPE	NUMBER	PERCENTAGE
MV	2	0,1%
VA	4	0,2%
CB	13	0,8%
ER	56	3,5%
Other	59	3,8%
PG	127	8,1%
UN	252	16,0%
TE	1065	67,5%
TOTAL	1578	100,0%

