US Army Corps
of Engineers
Kansas City District

TUTTLE CREEK DAM

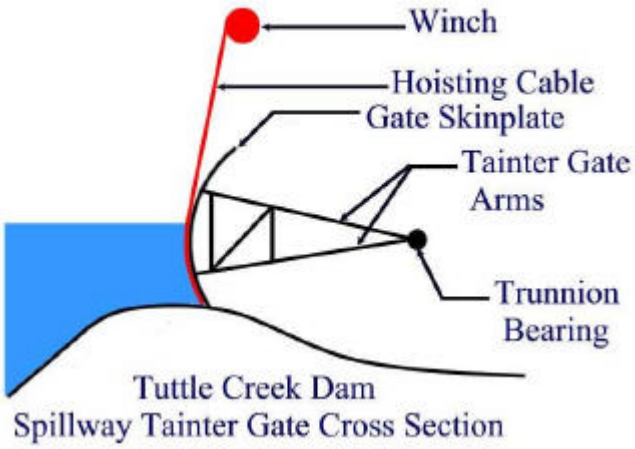
FACT SHEET

June 2001

SPILLWAY TAINTER GATES

The 18 gates in the spillway east of the dam are called Tainter gates after the man who invented the general design. The 40' wide and 20' tall spillway gates are normally closed, thereby allowing flood control storage to the top of the gate while providing the ability to release large volumes of water if necessary with high lake levels and high flows into the lake.

The upstream surface of a Tainter gate that is in contact with the lake is a steel skinplate. The Tainter gate arms transfer the water pressure on the skinplate to the trunnion bearing. As the gates are raised, they pivot on the trunnion bearing. The gates are raised with cables attached to electric hoisting equipment above the gate. See the figure below.



The Tainter gates were designed without considering stresses in the gate caused by friction in the trunnion bearing. This was standard practice in the 1950's. The current practice is to consider the extra stress placed on the gate by friction in the bearing when the gate is being lifted. Preliminary evaluation of the Tuttle Creek Tainter gates considering bearing friction stresses indicated the arms of the gate may be damaged when the gates are opened with water near the top of the gate. Although the gates worked as well in 1993, a gate with a similar design failed at Folsom Dam in California in 1995. The proper operation of the spillway gates must be ensured since properly operating gates are critical to safe operation during flood conditions.

As part of activities at Tuttle Creek Dam, it is likely that the Tainter gates will need to be strengthened to meet current design criteria and ensure safe operation.

This fact sheet is published by the U.S. Army Corps of Engineers, the lead agency for the Tuttle Creek Dam Safety Assurance Program.
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Questions or comments about lake operations or Tuttle Creek project office activities should be directed to the on-site Operations Manager, Brian McNulty at 785-539-8511.
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