REPORTS

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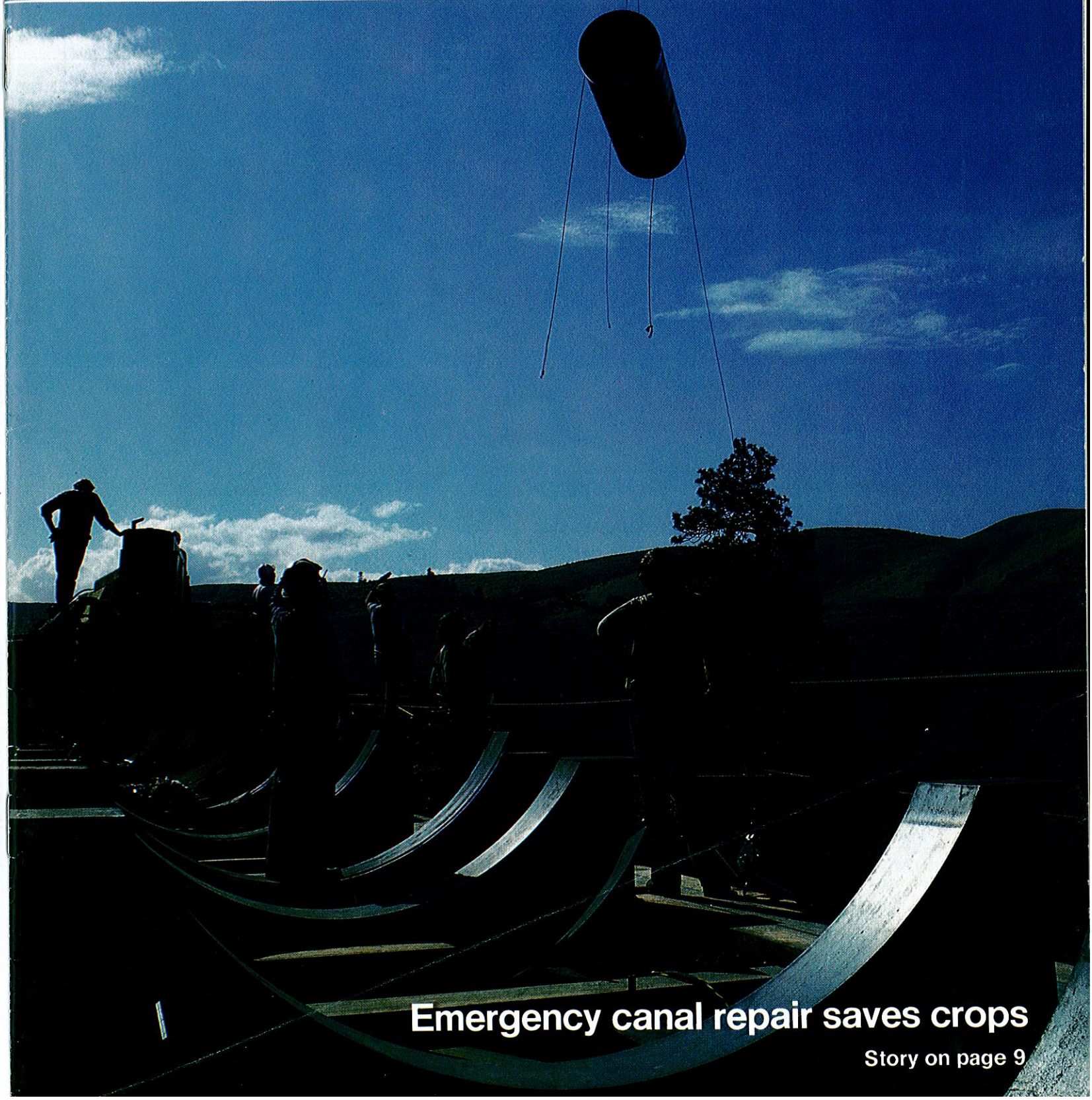

Emergency canal repair saves crops

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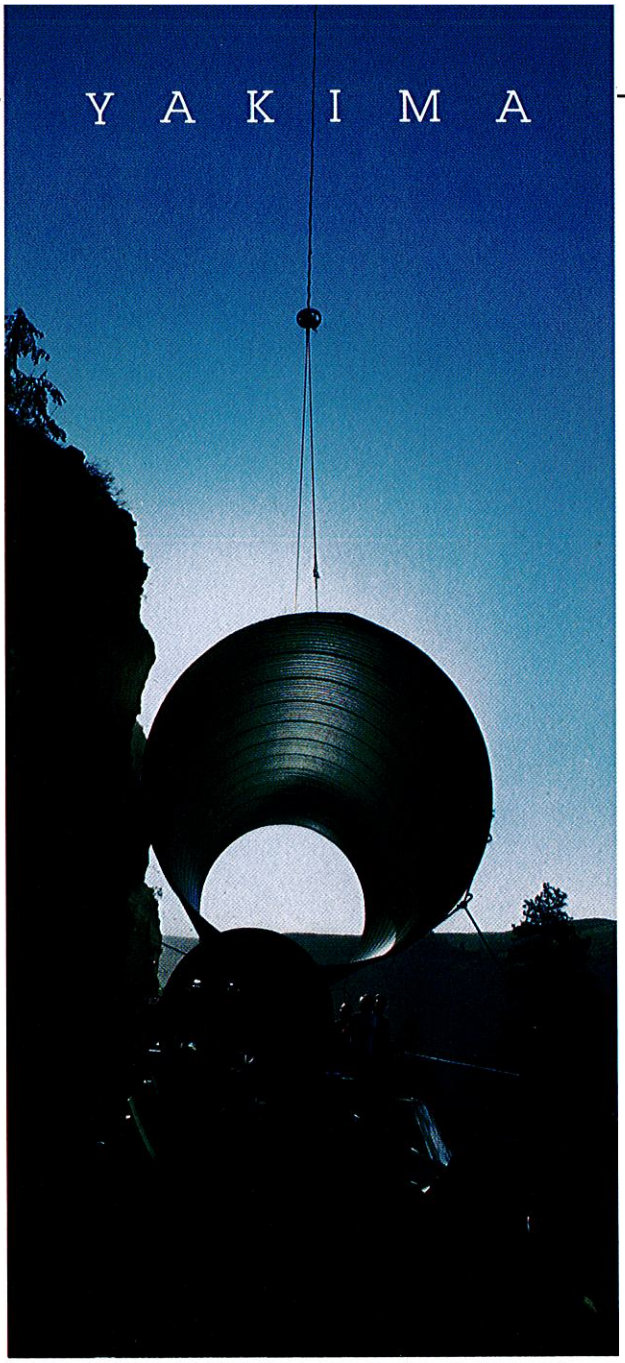

Rod Huling Photo

CRITICAL WATER SUPPLY RESTORED TO IRRIGATION DISTRICT

Story by Jane K. Osmer

The crisis occurred about 400 feet up a nearly vertical cliff, where a 100-foot-long section of a concrete irrigation canal had collapsed. This canal is the sole source of water for 26,000 acres of fruit trees. If not restored to operation within three weeks, serious damage to the crops could result.

This was the situation faced by Washington's Yakima Tieton Irrigation District in June. A cloudburst had sent rock, mud, sand and volcanic ash from nearby Mount St. Helens down the cliffsides, filling four sections of a 12-mile-long flume that carries irrigation water to the valley from the Tieton Reservoir behind Rimrock Dam. A backup and overflowing of water resulted. At one point, the overflow undermined the canal foundation, creating the break in the 70-year-old canal that now threatened a crop valued at up to $60 million annually.

The District immediately contacted CH2M HILL, currently consulting with the District on another aspect of their system. Responding to the emergency, CH2M HILL agricultural engineer Dick Haapala and geotechnical engineer Frank Pita set to work designing and scheduling, in conjunction with the District's manager, Warren Dickman, and the board of directors, who convened a series of emergency meetings as required.

"The immediate design solution had to be simple and reasonably easy to fabricate and construct," said Pita.

Replacement pipe was ordered that first day, and the contractor, Lee Turzillo Contracting Company, was on the job by the third day. Other major components of the new system were ordered and delivered to the site within three days.

The detail design for the new section was done at the site, while crews began the debris-removing operation to clear the face of the cliff to establish sound footing locations for the steel columns and beams which would serve as support for the pipe. Complicating this operation was the inhospitable terrain, with the only access being an 18-inch-wide trail next to undamaged sections of the flume.

Meanwhile, a Boeing-Vertol 107 twin rotor helicopter with a lifting capacity of 11,000 pounds was brought in from Portland, Oregon, and the steady dawn-to-dusk job of preparing and equipping the site began.

First, the helicopter "dusted" the area to blow away the gritty volcanic ash that had blanketed the region a month earlier. Then air compressors, grout mixing and pumping equipment, sand, cement and tools were airlifted to the site. A steel fabrication yard was set up in the valley and the steel support structure components were cut according to specifications determined at the site and welded.

The 15-foot steel columns were then flown to the cliffside and bolted into the rock. Next came the steel beams with saddles for the pipe. The contractor used a unique grouting and fabric forming system for a section of the foundation, and conventional redi-mix concrete was airlifted to the site in one-yard buckets.

The six 25-foot sections of 102-inch-diameter corrugated steel pipe were transported to the site in dramatic lifts from the valley floor. Closure collars to the existing flume were cast in place, and on July 4, 18 days after the cloudburst, water was running again in the canal.