



Arthur H. Walz, Jr.
Honorary President
United States Society on Dams

It is both an honor and pleasure for me to recognize the 40th anniversary of KNCOLD. KNCOLD has also been an active member of ICOLD with its members participating in the ICOLD technical committee activities and on occasion serving as Chair of a technical committee. Also, KNCOLD and USSD have enjoyed a successful professional relationship for cooperation since 2001.

For the past eleven years KNCOLD and USSD have shared many benefits from this cooperation. This included in members of KNCOLD making technical presentations at USSD meetings and USSD members attending KNCOLD activities. KNCOLD representatives have visited a navigation project on the Columbia River, where both organizations discussed design considerations



Soyang-Gang Dam as completed in 1973

and criteria. This cooperation and high level of exchange of knowledge and experiences has benefited the members of both organizations.

It is noteworthy that KNCOLD organized and hosted the very successful ICOLD meeting in Seoul in 2004. The technical committee sessions were successful. The symposium and technical tour was also noteworthy. The success of this meeting set a high standard for the future ICOLD meetings.

The information and experiences gained during the very notable and significant dam safety modification that was accomplished by Kwater at the Soyang-Gang Dam have been shared with USSD and are summarized below:

An example of the high quality dam engineering and construction in Korea is the dam safety modification of the multipurpose Soyang-Gang Dam constructed on the Soyang River. The dam was constructed between 1967 and 1973. The purpose of the dam is flood control, water supply and hydroelectric power generation. Construction on the dam began in 1967 and was complete in 1973. The 123 m (404 feet) tall dam withholds a reservoir of 2,900,000,000m³ (2,351,068 acre-feet) and supplies water to a 200 MW power station. The project has experienced rainfall events in 1984 and again in 1990, which exceeded the original spillway design inflow of 10,500m³/sec.

In response to these events, Kwater has had hydrologic studies and evaluations performed for the spillway design flood. The project PMF has also been reviewed and updated. This was accomplished in 1995, 1997 and 2001. There is good consistency among the studies for a PMF with 690 mm of precipitation and the precipitation of 810 mm producing an inflow of 20,712m³/sec.

It is not uncommon for a 30 year old project to be subjected to a new inflow design flood as a result of upstream development and changes in climatic conditions in the region. The current international trend for this type of evaluation consists of first verifying the magnitude and duration of the probable maximum precipitation. Then methods to increase the storage and/or increase the discharge capacity are studied. The owner, Kwater, reviewed the full a range of modification options. A summary of these alternatives are as follows:

- ▶ Change reservoir operation prior to and during the flood season
- ▶ Construction of an upstream dam



Spillway Discharge in 1990



Rendering of the diversion tunnel

- ▶ Increasing the dam height by
 - Raising the embankment
 - Parapet wall
- ▶ Increasing the discharge by an additional or emergency spillway located in the left abutment by constructing
 - Auxiliary spillway with a fuseplug
 - Auxiliary spillway with radial gates adjacent to the existing spillway
- ▶ Diversion tunnel

The diversion tunnel was selected, designed to eliminate cavitation and constructed.

The information and experiences gained by members of KNCOLD on this project have been shared with USSD membership. In closing, again, I want to congratulate KNCOLD for 40 successful years as a member of ICOLD and eleven years of cooperation with USSD.

Arthur H. Walz, Jr., P.E.
Honorary President