10 CONCLUSION

The characteristic aspects of the 1999 Ji-Ji earthquake are listed as below;

(1)The surface raptures caused by the reverse earthquake fault appeared in a huge area and caused catastrophic damage to bridges, dams, buildings, houses and lifeline facilities.

(2)Earthquake ground motions including near-field motions were observed at more than 4 hundred stations. These records can provide useful and instructive information and data for the further studies on the fault rupture mechanism and near field ground motions.

(3)Long period components of the earthquake ground motions around 5 seconds were observed and caused damage to storage tanks due to the sloshing of the content liquid.

(4)Liquefaction was observed on alluvial low land area and in the coastal area. Quaywalls at the port of Taichung moved toward sea more than 1 m and the ground behind the quaywalls subsides. Several buildings inclined and subsided due to the liquefaction.

(5)Numerous buildings and houses with low earthquake resistance which resulted from poor construction quality totally collapsed and killed more than two thousands people.

The following two lessons form the Ji-Ji earthquake should be carefully learned for the mitigation of the earthquake disaster in the world in the future.

(1)Strong ground motions in the near filed of earthquakes such as the observed during the 1995 Kobe earthquake have been taken into the consideration in the revision of earthquake design standards after the Kobe earthquake in Japan. However, the 1999 Kocaeli earthquake in Turkey and the 1999 Ji-Ji earthquake rose a new technical as well as social subject to be resolved in the future. That is how to treat surface ruptures caused by fault activities in the earthquake resistant design of structures. We have to review the current technologies for prediction of locations and magnitudes of surface ruptures, and further directions of the researches as well as the possibilities of the development of the methodologies to prevent the damage to various kinds of structures against the surface faultings.

(2)Most of human lives was lost due to the collapses of the residential buildings and houses. We, Japanese people had a similar experience at the time of the 1995 Kobe earthquake, and lost more than six thousands of people. In the seismic zones of the world there are numerous houses and buildings with very low earthquake resistance. The diagnosis and reinforcement of these houses and buildings are essential to reduce the number of casualties against future earthquakes.

The Japanese people experienced a tragic earthquake disaster in Kobe city and its neighboring areas about five years ago in 1995. At this time the people in Taiwan also had a severe experience by this JiJi earthquake. Taiwan and Japan have about a long history of cooperation in the earthquake engineering. All of the members of the JSCE team wish to deepen the partnership and friendship between Taiwan and Japan through close cooperations for the investigation into this earthquake disaster.