The water level continues to rise until the wave front reaches the top of the dam (Fig. 5(c)), where the wave front reaches the dam crest and overtopping process begins. Further overtopping causes a portion of water flows over the crest of the dam and swash down the rear slope (Fig. 5(d) – (e)), while the majority of water goes backward to the front slope and initiates the rundown process (Fig. 5(f) – (h)). After the wave reaches its maximum rundown point, the secondary run-up begins. The secondary wave run-up is much smaller than the first one, for the major portion of the wave has been reflected by the steep slope.

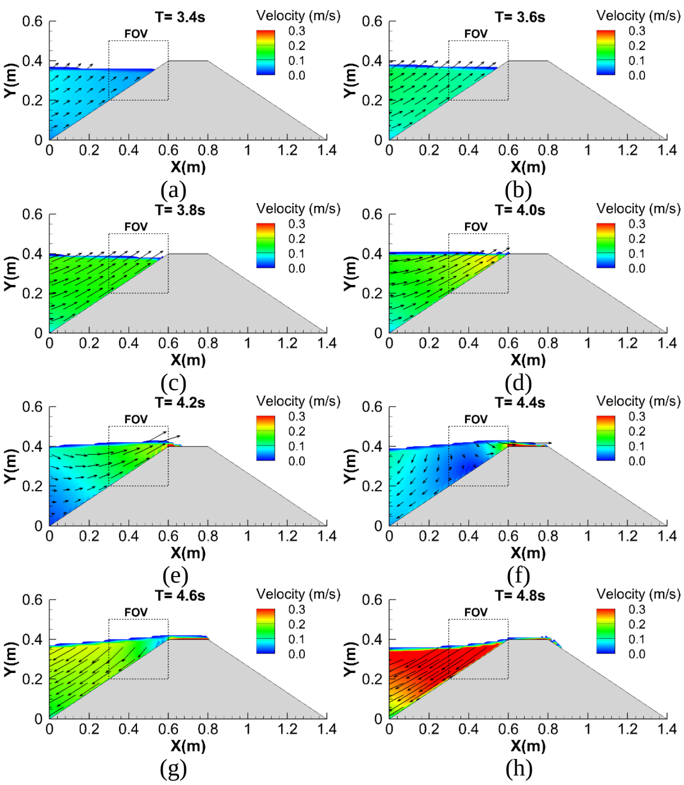

Fig. 5 Numerical simulation results of the dan overtopping process of the leading wave

CONCLUSIONS

In this paper, dam overtopping of the leading wave generated by water entry of a solid landslide is studied. Numerical simulations are performed with the same scenario as the available experimental data using a coupled fluid-solid numerical model with k-ε turbulence closure. Experimental and numerical results are compared for variations of surface elevation at gauge stations and show reasonable agreement. The comparisons demonstrate the numerical model can adequately reproduce the main hydrodynamic features of landslide generated wave covering the generation, propagation, and overtopping processes.

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