Collision Analysis of a Train Set Focusing on Fracture Mode of a Coupler

Hiroyuki SATO　　Tomohiro OKINO

In a collision accident of a train set, if a coupler fails, it may not be possible to maintain a constant spacing between adjacent vehicles. In such cases, a collision between ends of those adjacent vehicles may occur. Therefore, it is important to understand fracture behaviors of a coupler in order to study the crashworthiness of a train set. We conducted quasi-static compressive fracture tests to obtain deformation characteristics and fracture modes for each coupler angle. Furthermore, we used Finite Element (FE) model to study improvement of the crashworthiness of a train set without requiring major changes to a carbody structure. As a result, we confirmed that reinforcing an under support plate and adopting a coupler with energy absorbing element will contribute to prevention of fracture of a coupler and improvement of the crashworthiness of a train set.