Recent Trends of a R&D of Propulsion Systems in Abroad

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In the background that environment issue has become more important globally, various Japanese railway companies, institutes and manufactures have carried out various R&D of propulsion systems, such as brake energy storage to on-board secondary battery or capacitor and its reuse, fuel cell railway vehicle and high efficiency propulsion equipment. Such R&Ds have been carried out by foreign manufacturers or railway operators also. In this paper, concept, progress and prospect of R&D in the foreign countries and comparison of them with Japan, are shown.