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Editorial

Railway Carriage R&D

Progress in international standardization in the huge automobile market, has led to very severe technological competition between makers, backed up by demands for solutions to social losses caused by external costs, such as automobile pollution and accidents. Consequently, R&D is a major factor determining automakers' future destiny. In response to safety demands, they have replied with technical countermeasures ranging from seatbelts to airbags, impact-absorbing body designs, etc., and are also pushing the R&D envelope towards designing Intelligent Transport Systems (ITS) for autos. Although railway R&D has led to advanced electric and hybrid rolling stock as well as advanced battery technology for commercial fuel cells, current technologies use platinum catalysts, making costs extremely high. However, engineers are now focussing attention on perfecting low-cost fuel cells as an efficient and clean cyclic battery. ITS is another field with high potential for rail-based transport but although it has been put to practical use in Automatic Train Control (ATC) and Automatic Train Operation (ATO) systems, GPS implementations for improving signalling and safety have yet to appear in commercial railway use. What railways urgently need is higher-level R&D moving forward from automatic to truly 'intelligent' systems. As an example, in the area of diesel-electric (DE) locomotives, so-called hybrid powerpacks using an engine generator to produce power are commonplace but the underlying technology has hardly advanced for decades. If railway operators could really make fuel cells a commonplace reality in rail transport, there is no doubt it would lead to elimination of substations, power lines, catenary supports, trolley wires, pantographs, etc., which in turn would hugely reduce associated problems and maintenance costs. Similarly, tunnels with smaller cross sections could be excavated at greatly reduced construction costs and overhead railway infrastructure would have less visual impact on landscapes. But tackling these goals demands massive R&D and capital costs beyond the practical financial resources of railway operators and rolling stock manufacturers as individual groups
The solution is worldwide cooperation and cost-sharing, because if rolling stock manufacturers continue competing with each other in this narrow field, the automobile makers' future development of safer and less-polluting vehicles will quickly strangle the life out of many railway lines.

K. AOKI

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