

SECOND GENERATION DIESELS TO COME FROM GENERAL ELECTRIC

By T. A. McGavin

THE fifteen high-powered diesel-electric locomotives required by New Zealand Railways, primarily for express train services between Auckland and Wellington, are to be supplied in the latter half of 1971 by the General Electric Company of the United States. To be of the Co-Co type with 2,750 h.p. engines, they will be the first General Electric locomotives supplied to New Zealand. Each locomotive will weigh about 96 tons, and they will be the most powerful ever employed by New Zealand Railways.

When the Minister of Railways, Hon. J. B. Gordon, announced this on 24 August 1970, he said General Electric's offer had been selected as the most satisfactory of eleven valid tenders received from manufacturers in four countries. In evaluating the tenders, account was taken of the extent and annual cost of maintenance as well as of first cost. The delivery dates offered were also an important element in the choice.

Each of the new locomotives will be fitted with General Electric's latest model FDL12 diesel engine rated to develop 2,750 h.p. at 1,050 r.p.m. This gives an output of 2,600 h.p. available for traction, almost double the 1,310 h.p. traction rating of the 80-ton "Da" class locomotives that at present haul most of the trains on the North Island main trunk line.

The 1969-70 or 12th edition of *Jane's World Railways* showed the standard rating of General Electric's FDL-12 engine as

2,675 h.p. The engine was described as being 4-cycle turbocharged with water-cooled charge-air cooler. The cylinders had a bore of 9 inches (229 mm.), a stroke of 10½ inches (267 mm.) and a swept volume of 668 cubic inches each. Compression ratio was 12.7 : 1. Engine speed was 1,050 r.p.m. Locomotives fitted with this engine had a traction rating of 2,500 h.p. and were catalogued as model U25B or U25C according to whether they were mounted on 4-wheel or 6-wheel trucks. The letter "U" indicated that they were of the manufacturer's "Universal" series.

It was in 1956 that General Electric introduced its Universal line of export locomotives adaptable for various gauges and operating conditions anywhere in the world. Seven models were offered, all of which could be used for switching, freight, or passenger service, in four horsepower ratings: 700, 990, 1,320, and 1,980. By the end of 1957, 280 Universal locomotives were in service in Argentina, Brazil, Chile, Colombia, Mexico, South Africa, and Turkey. A 1,980 h.p. Co-Co type locomotive for Turkey, model U18C, illustrated in the 1958-59 edition of *World Railways*, was 52 ft long, 12 ft 4 in. high, and 9 ft 0 in. wide, and weighed 197,000 lb. (88 long tons). Since then, the number of countries

LEFT: One of the 146 "Da" class diesel-electric locomotives leads train 626, the 4.30 p.m. Wellington-Auckland express, through Waikanae on the Manawatu section of the main trunk line.

Photograph: N.Z. Railways Publicity



Photograph: R. J. McGavin

Class "Da" locomotives are often used in pairs on heavy trains to give 2,620 horsepower input to the traction motors. This Wellington-Woodville goods is passing the Melling Branch junction on 30 September 1969.

using General Electric diesel locomotives has risen to more than 60, and the number of locomotives is now in the thousands.

According to an article in the November 1956 issue of *Diesel Railway Traction*, the new standard range of diesel-electric locomotives introduced by General Electric early that year comprised nine models, of which two were designed primarily for 4 ft 8½ in. gauge tracks, or wider, and seven specifically for metre or 3 ft 6 in. gauge railways, although all could be readily adapted for use on wider gauges. Most of these locomotives were powered by Cooper-Bessemer diesel engines, but the two smallest models used Caterpillar engines. It is from the Cooper-Bessemer engines that the present FDL series of engines has been developed, and we shall await with interest details of the equipment to be provided on the locomotives for New Zealand next year.

It has been announced that they will be provided with the latest AC/DC transmission using solid-state silicon rectifiers; and that they will be able to work in multiple with existing locomotives on the North Island system. It is expected that high mileages will be obtained from the new locomotives between routine inspections and overhauls, and that their operating costs will be very favourable.

The fleet of predominantly General Motors locomotives that they will supplement includes 146 of General Motors' model G12 (NZR class "Da") and 17 of General Motors' model G8 (NZR class "Db"). The ubiquitous 80-ton "Da" class, of course, dates back to 1955, when the first 30 were introduced. This class is powered by the 12-cylinder version of General Motors 567 series of diesel engines, rated to produce 1,425 h.p., of which 1,310 h.p. are available



Photograph: General Electric

This General Electric U25B 2,500 h.p. diesel-electric locomotive was one of 30 ordered by the New York Central System in 1964. NYC was the eleventh major U.S. railroad to order U25B Universal diesel-electrics since the design was introduced in 1960.

for traction. Since this engine was superseded in the late 1960s by the General Motors 645 diesel engine, which delivers 1,650 gross horsepower and leaves 1,500 h.p. for traction, the company has replaced its G12 locomotive by the G22 series, G22 being applicable to four-motor locomotives and G22C to the six-motor or Co-Co versions.

Last year General Motors announced a development resulting from the addition of a turbocharger, and offered the GT22C model. Turbocharging boosted the output of the 12-cylinder engine to 2,475 gross horsepower, with 2,300 h.p. for traction. The GT22C was described as identical to the G22C, except for turbocharging. If General Motors were among the tenderers for the locomotives sought by New Zealand Railways, which seems reasonable to presume, it also seems reasonable to presume that the GT22C would have been the basis of their offer.

The success of General Electric in breaking into the New Zealand market will be watched with interest. It may not be generally appreciated that the General Electric Company, although it has only become a major locomotive manufacturer in its own right in the United States since 1960, was in fact a pioneer in the field of diesel traction. Jerry A. Pinkepank, writing in *Trains* magazine for November 1966 said that General Electric, for example, had built the very first diesel-electric locomotives in the United States, and was closely associated with General Motors before 1938 in the development of the first main-line diesel-electrics.

Since this article was written, it has been announced that the new locomotives for New Zealand will be classified "Dx" and numbered 2600 to 2614. Three are due to be delivered in April, and the balance later in the year.