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भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
Government of India-Ministry of Railways
Research Designs & Standards Organisation
LUCKNOW - 226 011

TECHNICAL CIRCULAR NO. 23

No. EI/3.1.39 / 1

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CHIEF ELECTRICAL ENGINEER,

- Central Railway, Mumbai CST-400 001
- Eastern Railway, Fairlie Place, Calcutta-700 001
- Northern Railway, Baroda House, New Delhi-110 001
- Southern Railway, Park Town, Chennai-600 003
- South-Eastern Railway, Garden Reach, Calcutta-43
- South-Central Railway, Rail Nilayam, Secund-rabad-71
- Western Railway, Churchgate, Mumbai-400 020
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)

Director, IRIEEN, Post Box No.233, Nasik Road, Nasik - 422101

Sub:- Haulage Capacity of WAG5 Locomotive with TAO Traction motor 15:62 gear Ratio in Run Through conditions on different gradients.

Single WAG5 locomotive is able to start and haul 4700 tonnes BOXN load on 1:360 gradient. For gradients higher than 1:360 twin locomotives are required for starting and hauling 4700 tonne load.

Single WAG5 locomotive is able to start and haul 3300 tonne BOXN load on 1:200 gradient.

Railways are using single WAG5 locomotive for hauling 4700 tonnes load on gradient steeper than 1:360 in run through condition.

Computer simulation have been done on 1 in 200 and 1 in 150 gradient for 4700 tonnes load and 1 in 150 and 1 in 100 gradient for 3300 tonnes load which can be negotiated in Run through conditions. To arrive at the lengths of such stretches at various attacking speeds, computer simulation results are given in table I and II for 4700 tonnes BOXN load and table III and IV for 3300 tonnes BOXN loads.

Table-1

Haulage Capacity on 1:200 Compensated up gradient in Run Through Conditions for 4700 tonnes BOXN LOAD

Attacking Speed (KMPH)	Max. length of 1:200 section which can be negotiated (Km.)	Exit Speed (KMPH)
20	0.5	15
30	1.00	23
40	2.00	27
50	4.00	26
60	5.00	32
70	5.00	40

Table-II

Haulage Capacity on 1:150 Compensated up gradient in Run Through Conditions for 4700t BOXN 'N' LOADS

Attacking Speed (KMPH)	Max. length of 1:150 section which can be negotiated (Km.)	Exit Speed (KMPH)
Upto 20	Not recommended	-
30	0.5	23
40	1.0	28
50	2.0	28
60	2.0	41
70	3.0	41

Table-III

Haulage Capacity on 1:150 Compensated up gradient in Run Through Conditions for 3300t BOXN Loads.

Attacking Speed (KMPH)	Max. length of 1:150 section which can be negotiated (Km.)	Exit Speed (KMPH)
Upto 20	Not recommended	-
30	1	23
40	2	28
50	3	34
60	5	33
70	6	35

Table-1V

Haulage Capacity on 1:100 Compensated up gradient in Run Through Conditions for 3300t BOXN Loads.

Attacking Speed (KMPH)	Max. length of 1:100 section which can be negotiated (Km.)	Exit Speed (KMPH)
Upto 20	Not recommended	-
30	0.40	22
40	1.00	21
50	1.00	36
60	2.00	31
70	2.00	44

2. Railways are requested to conduct field trials on the above guidelines in different sections. Based on such trials, you may issue guidelines to Drivers to enable them negotiate such stretches successfully without causing stalling and overloading of electrical equipment. RDSO may be kept apprised of the developments.

Ramesh Chandra

Encl: Nil

(Ramesh Chandra)
for Director General/Elect.

Copy to:

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2. Sr. Divl. Electrical Engineer (Operation),
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Ramesh Chandra

Encl.: Nil

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for Director General/Elect.