



Our Reference 4/26-61
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Subject PORTLAND - CAPE BRIDGEWATER PCM HBER

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To

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TRANSMISSION MEASUREMENTS TEST REPORT
Summary of Test No: 91/679
Date of Test: July, 1991

Transmission Measurements was requested by local installation staff to assist in the elimination of high bit error rates occurring in the transmission of 2Mbit digital data streams on the second PCM system in the Portland - Cape Bridgewater PCM route.

When the 'A' direction of system 2 was initially tested, approximately 11000 errors per hour were measured. In the 'B' direction, approximately 216 errors per hour were measured, 72 errors per hour is the specified number allowable. It was found that when the third PCM system was turned off, zero errors occurred in the 'A' direction of the second system, but errors still occurred at the same rate in the 'B' direction.

The initial design of the PCM regenerator housing layout was done with the intentions that only 2 PCM systems to Cape Bridgewater would be used and with the stipulation that all regenerator housing must be located at existing load coil locations. To fall within this criteria, PCM design standards had to be relaxed, with pairs selection carried out using the Barrage Tester.

TPH 0511 Transmission Design of 2/Mbit Line Systems in Junction Networks states that for a 20 pair cable no more than 2 PCM line systems are allowable, and that section length between regenerator housings be no more than 1500m long. In the Cape Bridgewater PCM routes most sections are well in excess of 1500m.

To overcome the above mentioned problems and to enable a third system to operate, the following steps were taken:-

In regenerator section 6 - 7 a new 'A' direction pair for system 2 was selected, being changed from pair 10 to 7.

In regenerator 7 - 8, two new pairs were selected for system 2, being changed from 10 and 18 to 7 and 15.

The regenerator section length between reg 8 and 9 was 2125m and a new regenerator housing (Reg 8A), had to be located at a joint 1419m from Reg 8. Please note that regenerator housing 8A has had no interrogation filters placed in it as none were available at the time of the cutover. A regenerator was replaced in position 2 to Reg 7 as it went faulty during testing.

Final Bit Error Rate testing carried out over 20 hours on system 2 showed in the 'A' direction zero errors in all but 3 hours, in which 4 errors each occurred. In the 'B' direction zero errors occurred. These results indicate that three PCM systems will operate between Portland and Cape Bridgewater within specifications.

CABLE DETAILS

DESIGNATION : G PORD VCP2 01, G GBWR VCP2 01
SIZE AND GAUGE : VARIOUS 0.90 & 0.64 (SEE CABLE PLANS)
REGENERATOR POSITIONS : 1, 2, 3
PCM GO PAIRS MAIN : 309, 310, 308
'B' : 9, 10, 8
PCM RETURN PAIRS MAIN : 317, 318, 316
'B' : 17, 18, 16

NOTE: For pair changes within regenerator sections, see report above.

SUPERVISORY PAIRS MAIN : 311, 312
'B' : 11, 12
ORDERWIRE PAIRS MAIN : 304
'B' : 4



for SUPERVISING ENGINEER - N.E.P.D. - TRANSMISSION MEASUREMENTS

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