

BHP IRON ORE – BRIDGES

BACKGROUND

The BHP Iron Ore mainline railway contains 37 bridges ranging from several meters to 200 metres long. Designed to carry 32 tonne axle loads, bridges represented one of the major impediments to increasing loads. A 1985 study predicted upgrading costs at more than \$50 million, thereby rendering uneconomic the concept of axle load increases.

PROGRAM

A major research program was initiated to rate the various bridge types by instrumenting various bridge structures to determine dynamic load factors and distributions into the primary members. The work thus determined allowable stress parameters enabling control of structural fatigue.



Steel girder Bridge on BHP-IO Goldsworthy Line

OUTCOMES

The study concluded that the bridges have a capacity exceeding 37 tonnes because of -

- much lower dynamic amplification factors measured on the bridge decks due to the high track standards enforced, compared with those generally assumed by the Code, and
- much lower axle load variability than generally observed in railway operations.

These studies along with frequent bridge inspections have provided BHP-IO the confidence to increase axle load without requiring expensive bridge modifications. Bridges designed for 32 tonne operations are now successfully bearing 37 tonne axle loads.

