Harbour Terminals Level Service Definition

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ABSTRACT

Certainly harbours move the country economy, for that reason it is necessary to know if the harbour is reliably competitive.
Nowadays this interest has grown due to the increasingly freedom for goods importation and exportation from all over the world. The necessity of tools creation, reflecting the Capacity and Service Level of the harbours appears, because the harbour maintenance on the market depends on that.
New studies are directed forwards the harbour evolution prediction for adapting it to future changes on time. This thesis is focused on Ro-ro port terminals, concretely on vehicle terminals.
The thesis begins with previous studies by revising documents related to this field from the end of the 70th decade. The next chapter characterizes Ro-ro terminal operations, specifically, the operations which take place at a vehicle terminal, keeping some lines to the existent documentation flow. The fourth chapter studies how capacity and service level indicators must be. Both indicators are defined along the thesis, because nowadays there is no global definition accepted.
The following chapter studies vehicle terminal deeply, dividing it into three phases that are named Phase I, Phase II and Phase III. The first one, covers from the ship arrival at the harbour to the cars arrival at stock door, dominated by FPR, the first car control point. The second one, is focused on stock study, dominated by car position and the ignorance about their departure date. And the third one, from the reception of the departure order by the terminal to the cars arrival at the exit harbour terminal door, dominated by PDI cue, where the vehicle is modified in function of the client requirements. For each one of the three phases, a methodology is suggested for the calculation of the Service level and the Capacity, standing out The Method of the Three Graphs for the calculation of the Level Service in the case of phases dominated by cues.
The Method of the Three Graphs combines one graph that can calculate one first Service Level in function of the time difference of the car route in one phase with respect to a reference time, a second graph that shows the probability of non maintenance on the first Service Level calculated in function of the time difference, and a third one that calculates a new phase Service Level but taking into account the probability of the previous graph.
The following part presents a numerical simulation of the method described at the previous chapter. Values are given to the parameters defined during the terminal formulation, allowing then to apply the different calculation methodologies for Service Level and Capacity for each one of the three phases.
At last, conclusions of all the study are collected, observing the importance of the FPR and PDI service rhythms, Phase I and Phase III respectively. Service rhythms have a notable influence in the Service Level and Capacity characterization results, as it is showed at the different simulations of Phase III, observing the different results by doing changes in the maxim limit of the duration of cars PDI service.