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### Conclusions and future work

According to the issues discussed in Chapter 4, it is clear that the operations involving the transportation of deck cargo to the offshore units of the Campos Basin could be improved regarding both the level of service and the cost. The large number of offshore units visited on the same trip and the multiple visits to the same offshore unit in one trip increase the mean transport time between the port and the offshore units, which increases the lead time, and the cycle time of the vessels. More importantly, this makes the planning and control of the operation a very difficult task. Hence, in Chapter 5, the main considerations that should be taken into account to improve the service policy of Petrobras were presented. A method to simulate the main points of the proposed service policy was developed. The real cargo demand was used and different routes were created to meet this demand, making it possible to ascertain how the logistic system would behave if a different policy were applied. Four scenarios were chosen for the analysis and according to the results obtained the feasibility of improving the operation of deck cargo transportation to the offshore units of the Campos Basin was demonstrated.

The main aspects that show these improvements are:

- the mean transport time between the port and the offshore units can be reduced, which reduces the lead time
- the mooring delays can be reduced, depending on the service policy selected
- the number of vessels, their cycle time and the total sailed distance can be reduced, which reduces the financial cost

It is clear that the different service policies affect the robustness of the offshore logistics system. Depending on the service policy selected, mooring delays may be increased or reduced and the trips may not meet the demand of the offshore units.

There are few studies which have addressed offshore logistics systems in the academic literature, as previously observed by other authors. In fact, although many people have learned about this issue empirically, the academic

knowledge is still in its early stages. In Chapter 3 a general view of the offshore logistics was given based on the case of Petrobras in the south and southeast of Brazil. In Chapter 4 an empirical data analysis of the maritime operations of the Campos Basin was carried out and a comparison with the results of Kaiser and Snyder (2010) and Halvorsen-Weare and Fagerholt (2011) was made. Parameters like the cycle time of the vessels and the number of visits to the offshore units were calculated. These helped in the organization of the knowledge and contribution of information to the academic literature.

In relation to future work, the following recommendations result from this study:

- a detailed study of the composition of the fleet
- a service policy for emergencies and priority cargo
- the study of the effect of port closure and of different plans to be implemented as soon as the port reopens
- a study that includes all of the supply chain of E&P