Multi-~~state~~ State Systems

The output of ~~the~~ a system ~~is~~ has a maximum ~~in~~ of three ~~situations~~states. In one ~~situation~~state, the output is zero, and in ~~other~~ two others, the ~~-~~output depends on both ~~the~~ load-sharing and stressful condition. Thus, the precise ~~determination~~ estimation of ~~this~~ the system availability and cost ~~are~~ is the very prerequisite ~~related to~~of the desired output. Figure 12 demonstrates ~~the~~ different operation states of the system. At the first state, the production rate is similar to the parallel structure, and at the fourth state, the system output is 100% ~~percent~~. At parallel state, the output is at the lowest level, and 50 percent is acceptable; thus, availability is at the highest level, and the cost is at the lowest level because of the minimum stressful condition.

Figure 12. The cost and availability of the MSLSS.

This result shows that when the acceptable performance level for an MSLSS is reduced, the system cost ~~is~~also ~~reduced~~ decreases ~~and~~ while the availability ~~is~~ increase~~d~~s. ~~-~~In the rest of the section, the impact of ~~significanc~~significant~~e~~ parameters ~~influence~~ on an MSLSS ~~are~~ is considered.

The Impact of Ordering Time ~~Effect~~

In the previous sections, the influence of ordering time on the load-sharing system was investigated. If the system is applied as MSLSS, ~~this~~ the ordering time effect ~~influence~~ is similar to its counterpart effect in the load-sharing system, and only when the desired level of the system performance is reduced, this influence ~~is~~ may decrease~~d~~. Figure 13 shows that for a system with 66.6% ~~percent~~ output~~;~~, ~~the availability is not changed with~~ ordering time ~~variation~~has no impact on the availability of the system. The ordering time ends up a crucial factor ~~Only~~ only when it is close~~d~~ to the replacement time (F ~~>>=~~ 0.95)~~, this influence is important~~. For a system with 80% ~~percent~~ output, ~~when F is greater than 0.7~~ this impact is important in case F is higher than 0.7. Eventually, if 100-% output is ~~required~~expected, ~~it is suggested that~~ the ordering is recommended to be carried out ~~when~~ provided that F is smaller than 0.5. ~~This behavior~~It demonstrates ~~when~~ that after the reduction of the stressful condition ~~is reduced~~, the failure probability is also expected to decrease~~d~~; therefore, spare parts can be ordered later, i.e., when ~~than~~ ~~a~~the system ~~with~~ attains the 100% output.

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Commented [A1]: When the output is zero, it simply means that the challenges, stressful condition, load-sharing failures, etc. result in the ultimate failure of a system, so, for sure in zero-output state, the output also highly depends on stressful condition and load-sharing. Either explain something in details in order to sufficiently clarify yourself or, if you believe brevity is an asset, be accurate, because precision is highly important to briefly express what you mean.

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Commented [A2]: Which system? When you say "this system", the reader should know which system are you talking about. It was changed to "the system" by the editor, but if you are talking about a specific system (for example, multi-state system), use adjective instead of "this".

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Commented [A3]: "The output is at the lowest, 50% is

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Figure 13. The impact of oOrdering time ~~influence~~ on the system availability for ~~the~~ different levels of the MSLSS output.

Figure 14 illustrates the influence of the ordering time on the system cost. It is obvious that with the reduction of the system stressful condition, the system cost subsequently decrease~~too~~. For all states, when ordering time is near to the failure time, the spare ~~cost~~ and repair costs ~~is~~ are likely to increase~~d~~, and ~~so~~ consequently, the total cost starts to ~~is grown~~increase~~t~~. Accordingly, ~~This~~ the cost increase ~~is~~ depend~~sed~~ on the output level, and ~~for the lower level output, it~~this ~~is~~ rise is smaller for the higher output.

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Figure~~.~~ 14. ~~Ordering~~ The impact of ordering time ~~influence~~ on the system cost.

The Impact of Supplier Selection ~~effect~~

In the previous section, the influence of the supplier selection on the ~~load-sharing system~~ cost and availability of the load-sharing system ~~is~~ was investigated. In this section, two configurations are studied to describe this influence on an MSLSS. ~~These~~ The two selected systems produce equal outputs, but their production rate is different. The spare parts of these systems are selected from two suppliers. Figure 15 shows the system cost and availability for these cases.~~,~~ T~~t~~he impact of the supplier ~~influence~~ on ~~all~~ the systems ~~are~~ is similar, and only when the share of supplier B ~~portion~~ is increased, there is a decrease in the total cost ~~is decreased and~~ and an increase in the availability ~~is increased~~.

Figure 15. The impact of the ~~Supplier~~ supplier ~~influence~~ on the system.

The influence of the supplier on the cost and availability ~~is~~ depend~~ed~~s on the system structure. For example, when the production rate of the first machine is four times higher than that of the second

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Commented [A6]: It seems to be the correct sentence, doesn't it?

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Commented [A7]: Earlier, you mentioned that "Figure 15 shows the system cost and availability for these cases," which one is correct, your previous saying or this one?

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machine (configuration 2), ~~and the~~its desired ~~value for~~ output is ~~80~~also expected to be four times higher than the output in the latter ~~percent of normal condition output~~. The supplier effect on this system is different from its counterpart in the previous system. At this situation, ~~the relation between~~ cost and supplier selection follow a non-linear ~~equation~~ relationship (Figure 16), because supplier B provides two spare parts with ~~the~~ different quality but similar costs, i.e., ~~so that~~ the first spare part ~~cost is~~ had a lower~~,~~ quality compared with the second spare part ~~is more reliable~~, but ~~its~~ the costs ~~is~~ were constant. This interaction between the quality and cost of the spare part ~~impress~~ overshadows the system behavior as well. When ~~the~~ identical spare parts are applied, there is not ~~this~~ such a variation. ~~isn't being seen.~~

Figure 16. The impact of ~~Supplier~~ supplier selection ~~influence~~ on ~~a~~ the MSLSS.

Commented [A8]: Is this what you mean? "latter" here refers to 'second machine'.

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