For the current system:

$\lambda_1 = \frac{5}{24} = \frac{0.2083\ products}{hr}$,

$\lambda_2 = \lambda_1 = \frac{0.2083}{hr}$,

$\lambda_3 = a_3 + \Sigma_i \lambda_i p_{i3} = 0 + \lambda_1 * 0 + \lambda_2 * 0.1 = 0.2083 * 0.1$

	Repair Station	Inspection Station	Combined Station
Arrival Rate (per hour)	0.2083	0.2083	0.0208
Service Rate(per hour)	0.25	0.3333	0.05
Performance Measures:			
ρ (utilization)	0.833	0.625	0.416
L (mean number in system)	4.995	1.666	0.712
w (mean time in system)	23.981	8	34.247
wQ (mean time in queue)	19.981	5	14.247
LQ (mean number in queue)	4.162	1.041	0.296
P0	0.167	0.375	0.584
Product Total time at Facility: 3.88 days			

Table 1: Current System.

For the proposed system:

$\lambda_1 = a_1 + \lambda_2 * 0.1$

$\lambda_2 = \lambda_1$

	Repair Station	Inspection Station
Arrival Rate(per hour)	0.2315	0.2315
Service Rate(per hour)	0.25	0.333
Performance Measures:		
ρ (utilization)	0.926	0.695
L	12.514	2.274
w	54.054	9.823
wQ	50.054	6.823
LQ	11.588	1.579
P0	0.074	0.305
Product total time at facility: 2.95 days		

Table 2: Proposed System

Using the current system as a state of reference, the proposed system will give the following changes in the long run: the mean number of products (L) in the repair station will go from 5 to 12.5, and the mean number of products in the queue for the repair station will also increase from 4.2 to 11.5. Similarly, for the inspection station, the mean number of products (L) will increase from 1.6 to 2.3 and the mean number of products in the queue(LQ) will go from 1.04 to 1.6.

Because of this, the proposed system will increase the utilization (ρ) of the repair station from 83% to 93%, and the utilization (ρ) of the inspection station will go from 63% to 70%. Although the proposed system will increase the total time spent (w), and the total time spent in the queue (wQ) of the products in the repair and inspection stations, the proposed system will lower the total time a given product is at the facility and goes to the customer from 3.88 days to 2.95 days on average. Also, the probability that the combined station is not used (P0) is of 0.584, which is high, and a product in this station spends 34.25 hours on average which is also high. By all these performance measures, *Leviathan Limited is* recommended to replace their current system with the proposed system since the new systems uses the facility stations in a more efficient way.