Satellite Launch

Suppose that you have been assigned to NASA as an operations analyst. Your first task concerns the use of a space shuttle to deliver several special purpose satellites into earth orbit. The shuttle that is to be used is a new type called an unmanned equipment delivery system (UMED). The satellites are commonly known as "brilliant pebbles" and they represent a significant new breakthrough in technology and form the first step in the development of the SDI initiative. If the UMED shuttle that is to be used is ordered today, let ORD.TIM be the number of days that will elapse before it arrives from the manufacturer. There is currently a sufficient supply of brilliant pebbles on hand, but each group of 5 requires an additional LAU.TIM (in days) to prepare, launch, and deploy from the shuttle. REC.TIM is the number of days to recover and return the shuttle to the same condition it had when received from the manufacturer (i.e., to "ready for launch" status). Only one group of 5 satellites can be launched at a time.

a. Develop a model that will estimate the time to launch N groups of 5 satellites if the time starts the day the shuttle is ordered. Be sure to state important assumptions.

b. Use the model developed in (a) to estimate the time to launch 25 satellites if each activity has a normal distribution with mean time and standard deviation as follows: ORD.TIM (50,5), LAU.TIM (30,6), and REC.TIM (40,7).

c. Your boss thanks you for the estimate and informs you that it better be a good one. If the UMED takes more than 60 weeks to launch 25 satellites, he could have chosen a better alternative. What does your model indicate about this?