The art of standing and sitting

When the formidable Hannah McHoot founded the Backenac Sewing Circle over a century and a half ago, she felt that the members should have some physical and mental stimulation after bending over their needles for two or three hours. So she devised a complicated method for how the ladies should all stand up at the end of the session, one that is used to this very day.

Currently, the circle has six members, Amelia, Briony, Caitlin, Dorcas and Edwina, in order of seniority. When it is time to rise, Amelia can stand or sit at any time. However, Briony can move only when Amelia is seated. Caitlin can move only when Briony is seated and Amelia is standing. Dorcas can move only when Caitlin is seated and both Amelia and Briony are standing. Finally, Edwina can move only when Dorcas is seated and the remaining three are standing.

Explain how the five ladies, initially all seated, can all be on their feet at the same time in the fewest moves.

****

It can provide quite a bit of amusement in a school class or at a party to have a few people, assigned an order of precedence, stand up following the rule, where each after the first can move only if the immediate predecessor is seated and the other predecessors are all standing. One can get into this problem by trying it with fewer people than five and seeing what patterns emerge.

In the case of our five ladies, we can achieve our goal by having them move in the following order: A, C, A, B, A, E, A, B, A, C, A, B, A, D, A, B, A, C, A, B, A.

More recently, the ladies of the sewing circle decided to try the procedure when they met. What would be the order of movement to take the five ladies from a standing to a sitting position?

It is interesting to record the order in which the individuals move when the number is other than five. How does the number of moves required depend on the number of individuals?