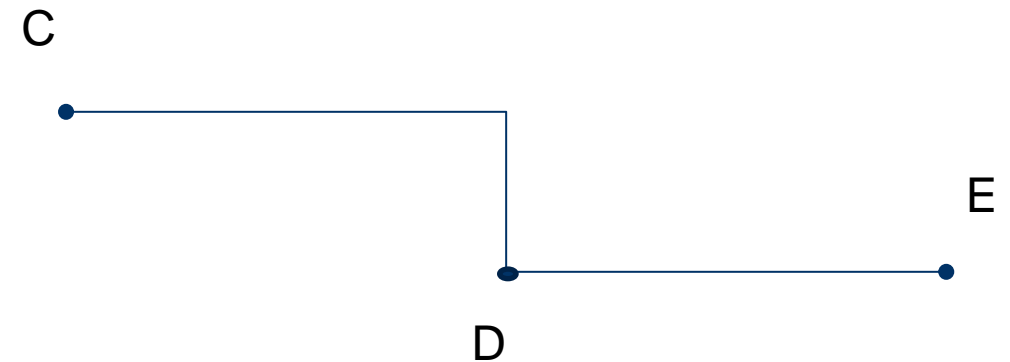


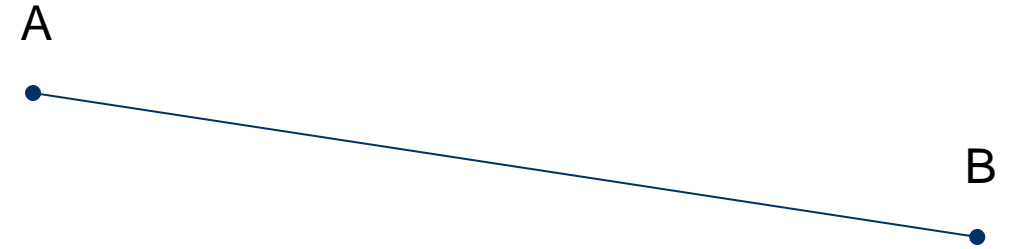
Managing Required System Upgrades

Special Planning Committee
March 29, 2019

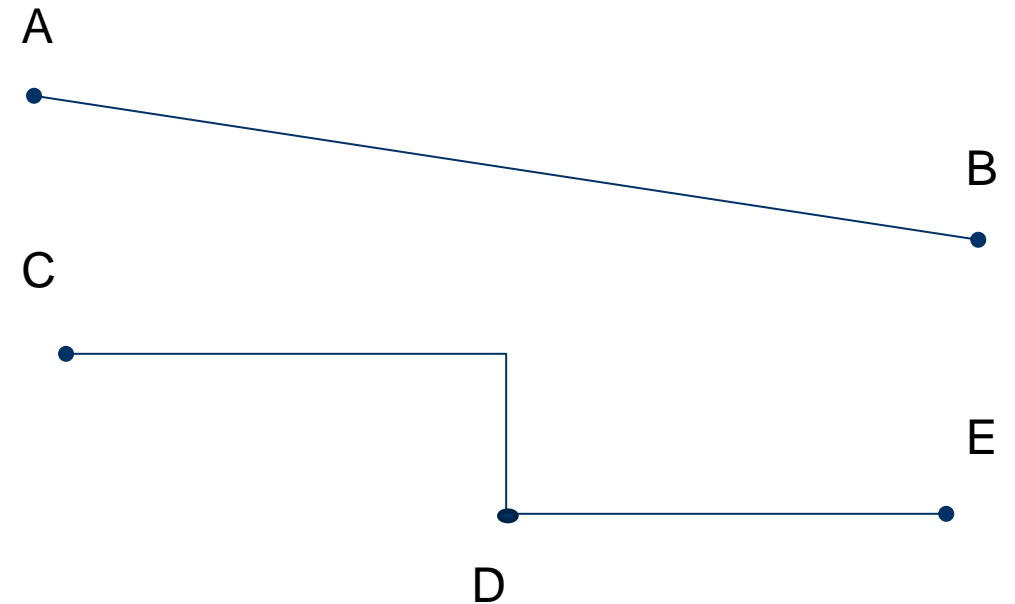
- First required upgrade involves increasing rating at substation D eliminate violation / need and increases the rating of the element from C to E



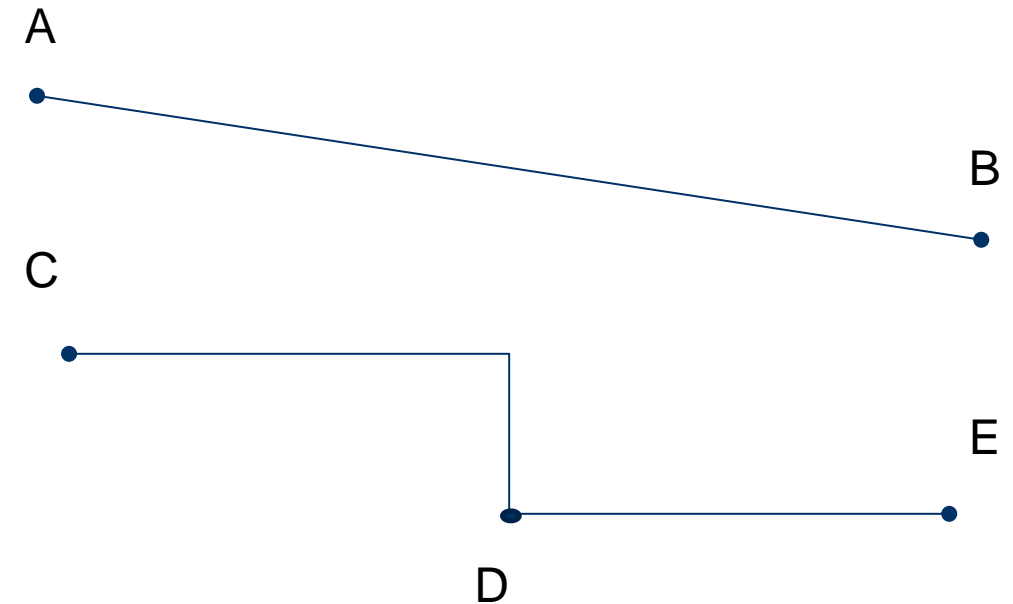
- Second project involves upgrading / replacing facilities between substations A and B resulting in an increase in rating of the element from A to B



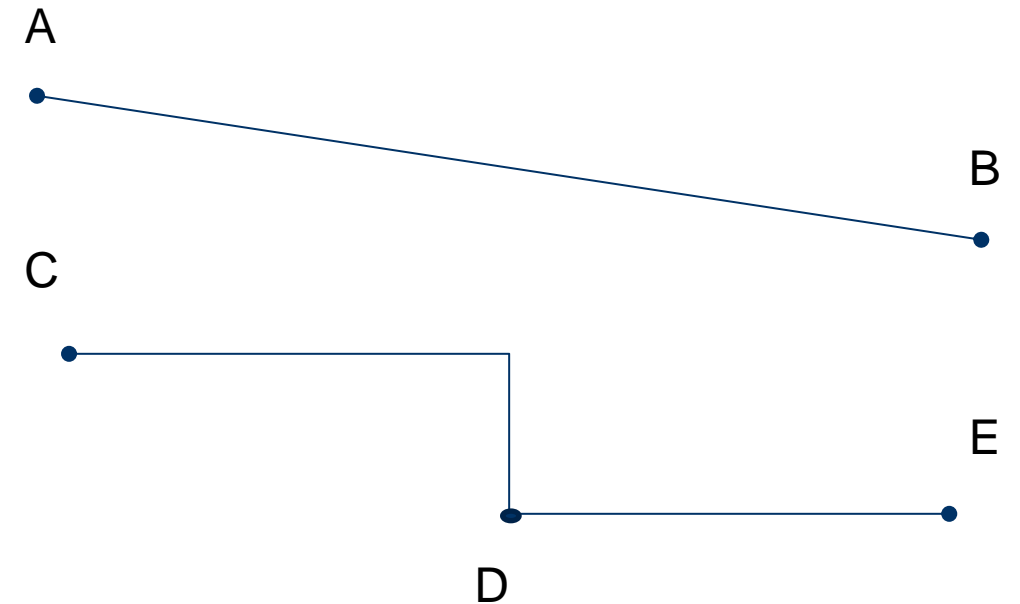
- The A-B project is in proximity to C-D-E and reduces the flow on D such that D does not need to be upgraded



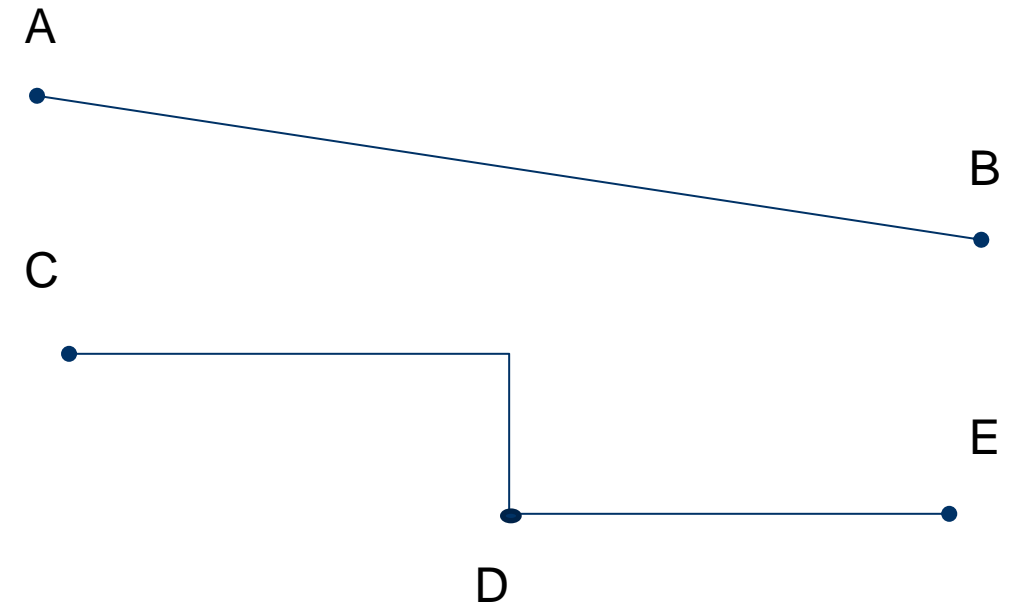
- A-B is a baseline upgrade identified after the need for a Network Upgrade at D
 - If the Network Upgrade is not required prior to the baseline (queue customer(s) requiring upgrade will not come into service before the baseline is completed), the customer(s) requiring the Network Upgrade at D will offset costs associated with the baseline A-B based on the cost estimate for D
 - If the Network Upgrade is required prior to the baseline then both move forward



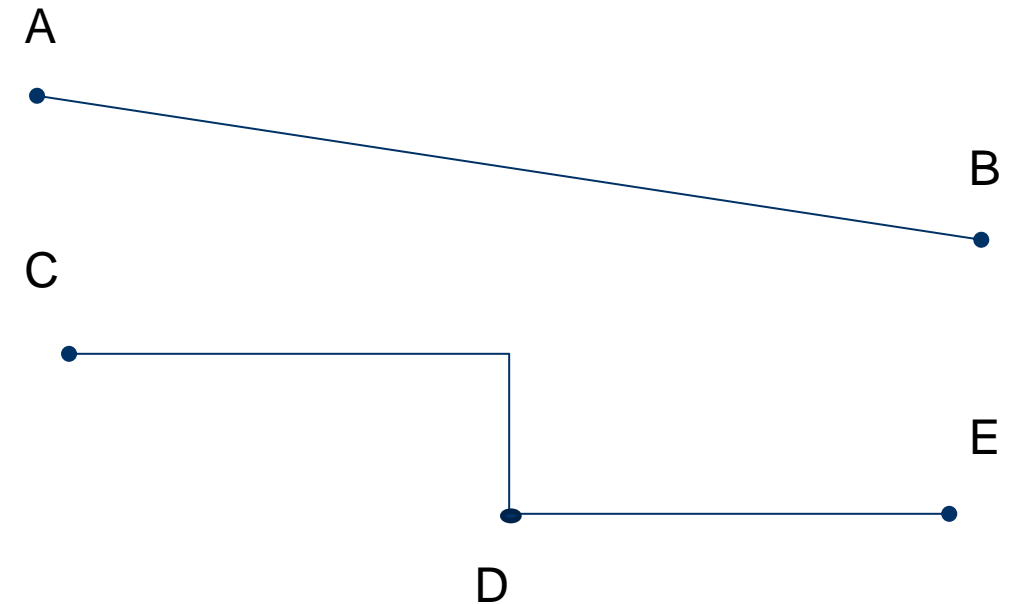
- A-B is a Network Upgrade identified after the need for a baseline upgrade at D
 - If the Network Upgrade is not constructed prior to the baseline (queue customer(s) Network Upgrade comes into service after the baseline is scheduled to be constructed), both move forward
 - If the Network Upgrade is constructed prior to the baseline upgrade, then the baseline is not constructed and the queue customers receive offset to their costs consistent with Part VI of the OATT



- A-B is a Supplemental Project, and D is a baseline upgrade or a Network Upgrade
 - The baseline upgrade, or Network Upgrade, will move forward unless the Supplemental Project can be completed by the time it is needed to meet the requirements for the baseline or queue customer
 - If the Supplemental Project is completed and the Network Upgrade is not built due to the Supplemental Project eliminating the need for the Network Upgrade, the customer(s) requiring the Network Upgrade will provide funds to offset the costs of the Supplemental Project consistent with the costs of the Network Upgrade



- A-B is a baseline upgrade or a Network Upgrade, and D is a Supplemental Project
 - PJM will discuss the Supplemental Project with the Transmission Owner proposing the project to determine if the upgrade of A-B would eliminate the need to perform an upgrade at D



- Diagram to the right represents a queue project (dot on diagram to right) and multiple violations of criteria which require reinforcement (represented by lines on diagram to right)
- Line in red is an element which may require an upgrade under the baseline or Supplemental Project processes



- When one reinforcement, the Network Upgrade in red, is required by multiple queue projects and the underlying baseline or Supplemental Project is removed, there is a greater chance that uncertainty associated with the requirements of the Network Upgrade will delay queue projects and could increase the number of re-tools for all projects with common upgrades
- As more queue projects (dots) are linked through a common upgrade (red line), there is an increasing impact to queue studies when a single upgrade is impacted based on changes to the underlying assumptions (modeling of upgrades in the base case) that developed the need for the upgrade

