

The increasing injections of energy from renewable energy sources far away from load centers have resulted in a more congested transmission grid. As the construction of new lines is costly, other options should be exploited as well. One possible solution is dynamic thermal line rating (DLR), which, instead of static thermal line rating, adapts the transmission capacity based on the expected weather conditions. This results, on average, in higher transmission capacities. First pilot projects have proven its efficiency. This paper analyzes the potential of DLR and demonstrates how DLR can be integrated in a dispatch optimization while managing possible errors in the forecasts of the line ratings with two different approaches. Both approaches result in robust optimization problems and guarantee that there is a suitable remedial action for all realizations of forecast errors given by uncertainty sets. The first approach relies on corrective control actions that are calculated centrally, once the actual line rating is known. The second approach relies on affine policies, which directly relate the current line rating to corrective control measures. This approach can be deployed in a decentralized manner. In case studies, the two approaches are applied and the reduction of overall operational costs is investigated exemplarily as a function of the forecast accuracy.