The Goeritz group of a Heegaard splitting for a closed orientable 3-manifold is defined to be the subgroup of the mapping class group of the Heegaard surface consisting of mapping classes that extend to both handlebodies. It is natural to study the structures of these groups, and so finding their generating sets or presentations has been an interesting problem. However, generating sets or presentations of them have been obtained only for few manifolds with their splittings of small genus. In this talk, we give a short historical overview of this problem and introduce its recent progress together with some applications. (Received July 15, 2016)