Let $X$ be a complex Banach space and let $P: X \to X$ be a linear projection, that is, a linear mapping with the property $P^2 = P$. A projection $P$ is called a generalized bicircular projection if the mapping $P + \lambda(I - P)$ is an isometry for some modulus one complex number $\lambda \neq 1$. The notion of a generalized tricircular projection naturally arises when a combination of two mutually orthogonal projections $P$ and $I - P$ is replaced with a combination of three projections $P$, $Q$, $R$ satisfying $P \oplus Q \oplus R = I$. The aim of this talk is to describe the structure of these mappings on certain spaces of operators. (Received August 20, 2015)