Scott [1] showed that every countable structure can be described up to isomorphism among countable structures by a sentence of $L_{\omega_1\omega}$ known as its Scott Sentence. There is a kind of normal form for infinitary sentences, so that each can be classified as $\Pi_\alpha$ or $\Sigma_\alpha$ for some countable $\alpha$; a conjunction of a $\Sigma_\alpha$ and a $\Pi_\alpha$ sentence is called $d$-$\Sigma_\alpha$. Every finitely generated structure has a $\Sigma_3$ Scott sentence. Matthew Harrison-Trainor and Meng-che Ho [3] showed that a finitely generated structure has a $d$-$\Sigma_2$ Scott sentence iff it is self-reflective, i.e., contains a proper $\Sigma_1$-elementary substructure isomorphic to itself. The speaker, McCoy, and Knight [2] showed that this condition also holds iff some generating tuple has a $\Pi_1$-definable automorphism orbit. In this talk, we generalize the notion of a finitely generated structure, and show that a finitely $\alpha$-generated structure has a $d$-$\Sigma_{\alpha+1}$ Scott sentence iff it is $\alpha$-reflective, or equivalently if some $\alpha$-generator has a $\Pi_\alpha$-definable automorphism orbit.

