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The residual nilpotence of verbal wreath products. (English)

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Let G be an arbitrary group and H a free group in some variety of groups V . Denote by F the verbal wreath product $H \wr_V G$. Let p be a prime and N_p the class of nilpotent p -groups of bounded exponent. It is shown that if $G, H \in N_p$, then $F \in N_p$. There are given some sufficient conditions for residual nilpotence of F in terms of G and H . In particular, if H is a residually torsion-free nilpotent group then F is nilpotent if and only if $\bigcap_{k \geq 1} \omega^k(\mathbf{Z}G) = 0$, where $\omega(\mathbf{Z}G)$ is the augmentation ideal of the integral group ring $\mathbf{Z}G$. There are given numerous applications of the previous results.

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