962-53-112 **Richard H. Escobales*** (escobalr@canisius.edu), Department of Mathematics and Statisics, Canisius College, Buffalo, NY 14208-1098. *Integrability criteria for distributions orthogonal to foliations on closed Riemannian manifolds.* Preliminary report.

We first study a flow $\mathbf{F}$ on a closed, connected, n-dimensional, Riemannian manifold (M, g). We assume that the mean curvature one-form κ associated with $\mathbf{F}$ is closed. We show that this induces canonically a flat Bott-type connection D on $\mathbf{V}$, the distribution tangent to the flow $\mathbf{F}$. We observe that in fact this connection D depends only on the real cohomology class $[\kappa]$. Then the natural exterior derivative $\tilde{d}$ associated with this Bott-type connection on $\mathbf{V}$-valued differential forms has the property that $\tilde{d} \circ \tilde{d} = 0$, and so one think of a cohomology of $\mathbf{V}$-valued differential forms, $\tilde{H}^*(M, \mathbf{V})$. We show that $\mathbf{H}$, the distribution orthogonal to $\mathbf{V}$ in TM with respect to the metric g, is integrable if and only if a certain non-trivial cohomology class exists in $\tilde{H}^1(M, \mathbf{V})$. Hence, in the integrable case, $\tilde{H}^1(M, \mathbf{V}) \neq 0$. We discuss an analogue of this result for a distribution orthogonal to a foliation $\mathbf{F}$ of leaf dimension $p \geq 2$, although now the ancillary conditions do not involve mean curvature. We conclude with other similar results. (Received September 18, 2000)