Deuterium NMR was used to investigate the orientational order in a composite cellulosic formed by liquid crystalline acetoxypropylcellulose (APC) and demented nematic 4’-pentyl-4-cyanobiphenyl (5CB-4 alpha d(2)) with the percentage of 85% APC by weight. Three forms of the composite including electro spun microfibers, thin film, and bulk samples were analyzed. The NMR results initially suggest two distinct scenarios, one when the 503-alpha d(2), is confined to small droplets with dimensions smaller than the magnetic coherence length and the other where the 503-alpha d(2) molecules are aligned with the APC network chains. Polarized optical microscopy (POM) from thin film samples along with all the NMR results show the presence of 5CB-alpha d(2) droplets in the composite systems with a nematic wetting layer at the APC-5CB-alpha d(2) interface that experiences an order-disorder transition driven by the polymer network N-I transition. The characterization of the APC network I-N transition shows a pronounced subcritical behavior within a heterogeneity scenario.