Wake Field Effects Analysis in the APT Linac, S.S. KURENNOY, LANL - The 1.7-GeV 100-mA CW proton linac is now under design for the Accelerator Production of Tritium (APT) Project. The APT linac comprises both the normal conducting (below 211 MeV) and superconducting (SC) sections. The high current leads to severe restrictions on allowable beam losses (<1 nA/m), that requires analyzing carefully all possible loss sources. While wake-field effects are usually considered negligible in proton linacs, we study these effects for the APT linac to exclude potential problems at such a high current. Loss factors and resonance frequency spectra of various discontinuities of the vacuum chamber are investigated, both analytically and using 2-D and 3-D simulation codes with a single bunch as well as with many bunches. Our main conclusion is that the only noticeable effect is the HOM heating of the 5-cell SC cavities. It, however, has an acceptable level and, in addition, will be taken care of by HOM couplers.