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Impurity and radiated power measurements on the Pegasus Toroidal Experiment¹ M.J. FROST, M.W. BONGARD, R.J. FONCK, G.D. GARSTKA, University of Wisconsin-Madison, T. HOANG, Texas A&M University — Emissive plasma gun current sources are employed as helicity injection devices for non-inductive startup of ST plasmas in Pegasus. The characterization of plasma impurity content and radiated power losses is of special interest in these non-ohmic discharges. To that end, radiated power losses are measured by two 16-channel AXUV silicon diode arrays that view the plasma tangentially across the mid-plane from the center column to the outside limiter. These measured intensities are post-processed using an Abel Inversion technique and fitted plasma equilibria to produce radial emissivity profiles. Bolometry of gun-produced plasmas indicates a rapid increase in radiated power after flux closure. Impurity species content is provided by VUV spectra obtained using a SPRED spectrometer. This instrument is capable of delivering a full spectrum from 10 to 110 nm at a 5 kHz rate. Oxygen is typically the dominant impurity, although at highest injection powers, metallic impurities from the gun and/or diverter impact region become evident. Qualitative observations of the O-V/O-IV line ratio suggest $T_e > 50$ eV for these large start-up plasmas.

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