Dielectric relaxation spectra have been recorded over a broad frequency range (~0.1 \leq \nu/\text{GHz} \leq 20) for the room temperature ionic liquid N-methyl-N-ethylpyrrolidinium dicyanamide. The major process, at ~7 GHz, is complex but appears to involve cooperative relaxation of the IL network similar to those observed for strongly H-bonded liquids. Its relaxation time shows Arrhenius behaviour as a function of temperature, with an activation energy of 18.6 kJ/mol. The dielectric constant \( \varepsilon \) was found to be 14.0 \pm 0.3 decreasing exponentially over the temperature range 15 - 55 °C. Dielectric measurements of the IL in the weakly coordinating solvent dichloromethane showed that the cooperative relaxation persisted until at relatively high dilutions evidence of smaller ionic aggregates at ~1.2 GHz was observed.