Robert D Gray* (robert.d.gray@uea.ac.uk), School of Mathematics, University of East Anglia, Norwich NR4 7TJ, Norwich, Norfolk NR4 7TJ, United Kingdom. Investigating groups of units of special monoids using boundaries in Schützenberger graphs.

A monoid presentation is called special if all of the relations are of the form $u = 1$. In a series of papers in the 90s Louxin Zhang proved several interesting structural and computational results about monoids defined by finite special presentations. In this theory he builds a certain infinite complete rewriting system and uses it to relate properties of the monoid to properties of its group of units. For example, his theory gives finite presentations for the units and right units of the monoid, and can be used to show that the monoid has decidable word problem if and only if its group of units has decidable word problem. In the case of one relator special monoids his theory gives a very neat alternative proof of Adjan’s theorem that one-relator special monoids have decidable word problem. In this talk I will present some recent (and ongoing) joint work with Nik Ruskuc (St Andrews) which investigates, so-called, Cayley graph boundaries of the units and right units of monoids. I shall explain how our results can be used to give new simpler proofs of some of the results of Zhang for special monoids. Then I will give an account of the progress we have managed to make so far on extending these results to investigate properties of the groups of units of special inverse monoids. (Received August 15, 2016)