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JET experiments on massive gas injection S.A. BOZHENKOV, R.C. WOLF, MPI, S. BREZINSEK, A. HUBER, U. KRUEZI, M. LEHNEN, FZJ, S. JACHMICH, ERM/KMS, G. ARNOUX, P.D. MORGAN, UKAEA, JET EFDA COLLABORATION — We present JET experiments on massive gas injection for disruption mitigation. Stable plasmas were terminated by Ne, Ar or their D_2 mixtures. Reaction time of the method consists of vacuum gas flow and plasma edge cooling. This time depends on the injection and plasma parameters. In the following thermal quench the plasma is rapidly cooled, with up to 50% of the energy being radiated. Finally, the plasma current is ohmically dissipated. Since the current decay rate depends on the species, control of the halo currents is possible. Ar and Ne cause runaway generation in the current quench. The runaway conversion exceeds 50% for Ar, while a lower one is found for Ne and no runaways are observed for mixtures. Runaways can locally heat the wall above 1500°C. For suppression of runaways the fueling efficiency is important. It decreases with the gas mass from 25% for Ne/D_2 to 3% for Ar. Our results suggest that for ITER: a further increase of the energy radiated in the thermal quench to 90% is necessary; the halo current control is feasible; and the runaway suppression remains an issue.

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