Demagnetization of Pipe Ends
(Manually, using a WD-Series Coil)

After Pipe is strung on the right-of-way, the ends are typically magnetized, for a variety of different reasons. If this magnetization is severe enough (>10 Gauss) it will cause Arc Blow (or Arc Bending), which causes the weld arc to move from the intended area. Arc Blow is unpredictable to its direction or severity, and can only be compensated by a good journeyman when using a ‘stick’. Automatic Welders don’t have a closed loop feedback system (brain) like a journeyman, so Arc Blow cases a greater degree of problems, for each root and hot pass.

The only reliable way to Demag the ends of the pipe is with a Reversing and Decaying DC procedure. This is accomplished on individual ends for either a repair or with new construction where an operator has been sent ahead of the Welding Crews to Demag all pipe ends. The operator simply positions the Coil on the end of the Pipe, as illustrated to the right. This view does not show a Centralizing Assembly which is standard on all Pipe Demagnetizing Coils (PD Series).

Using the Remote Control Panel, as illustrated to the right, the operator he quickly energizes the coil and induces a controlled magnetic field. He then reduces his amperage setting, reverses his field direction, and again energizing the Coil. This procedure is repeated for 4 to 6 cycles times, depending on the wall thickness and diameter. It goes without saying that the Operator Demagnetizes both end of the pipe before moving on to the next joint. This Demag performed ahead of welding, by as much as a week. Depending upon the strength of the magnetic field in the middle portion of the pipe, the magnetic field will ‘creep’ back toward the pipe ends, however it will obviously take more that a week for this to occur, so waiting a day or two is just fine. However if the demagnetized end is touching another piece that is magnetized, a field can easily creep back into the end, but this will take hours to occur. It only makes sense to weld when both ends are demaged.
When a repair is being done, where a new section of pipe is being added due to a cut out, the pipe ends are done individually. After the replacement section of pipe has been cut, beveled and fitted into place, the coil can be placed onto each end and demagnetized. The Coil then can be moved over to one of the existing ends, where that end is demagnetized. The Coil is then moved to the other end of the repair, so the other end of the existing line can be demagnetized. The new piece of pipe can then be put into place and the ends welded.

Magnetized pipe ends are not limited to Pipelines, and the same demagnetization processes can be used for making up pipe spools in Process Piping. Here ends of pipe are demagnetized as outlined above, however Flanges and Welding Fittings need to be checked for magnetism. Depending on the type of fitting, operators may have to be creative. Tee’s may need all 3 ends demagnetized, however the Coil may have to be placed some distance away from each end (½ diameter from each end) as not to affect the field in the other 2 ends. Again, Elbows most likely need an offset from each end to avoid introducing an unwanted field into the other End. Flanges can be dropped into a coil that is laying down, and a Demag procedure is performed. If a flange is larger in diameter than the ID of the Coil, it can be placed on top of the coil, again lying down, and a Demag procedure performed.

This article is a basic outline, that has been prepared for operators. It is recommended that the owner’s welding engineer or the contractor’s welding superintendent prepare their own operating procedures for Demagnetization. As organizations become more familiar with the various parameters, of magnetism affecting welding, demagnetization will become standard practice like it is in the drilling industry.