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Some not such wonderful magnetic fusion facts; and their solution[1] WALLACE MANHEIMER, Retired from NRL — The first not such wonderful fusion fact (NSWFF) is that if ITER is successful, it is nowhere near ready to develop into a DEMO. The design Q=10, along with electricity generating efficiency of 1/3 prevents this. Making it smaller and cheaper, increasing the gain by 3 or 4, and the wall loading by an order of magnitude is not a minor detail, it is not at all clear the success with ITER will lead to a similar, pure fusion DEMO. The second NSWFF is that tokamaks are unlikely to improve to the point where they can be effective fusion reactors because their performance is limited by conservative design rules. The third NSWFF is that developing large fusion devices like ITER takes an enormous amount of time and dollars, there are no second chances. The fourth NSWFF is that it is unlikely that alternative confinement configurations will succeed either, at least in this century; they are simply too far behind. There is only a single solution for fusion to become a sustainable, carbon free power source by midcentury or shortly thereafter. This is to develop ITER (assuming it is successful) into a fusion breeder.

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Wallace Manheimer
Retired from NRL

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