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Status (April 4, 1997):

This will be the final TFTR Update for the last tokamak experiments on TFTR were conducted last night going into this morning. The final shot occurred at 1:50 am this morning.

This Update is dedicated to the outstanding team of scientists, engineers, technicians, administrators, and office and clerical staff who are responsible for the successful operation of TFTR and the historic D-T experiments. I want to express my gratitude and thanks to the following for their contribution to the recent series of experiments on TFTR:

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Ed Cecil

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University of California at San Diego:
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U. Wisconsin:
Jim Callen:
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This day was devoted to completing the calibration of diagnostics, several experimental proposals and performing an integrated operations experiment.

Several discharges for the MSE diagnostic were taken for calibration purposes. These were mainly co-injection or counter injection shots to produce a large amount of Er. This will be used for cross calibration with the MSE-Er channels.

With high power neutral beam injection in reverse shear plasmas, transitions to the Enhanced Reverse Shear (ERS regime) are often characterized rapid rises in the central electron density . Evidence is strong that these "delta-n" transitions are formed and sustained by ExB shearing of turbulence. However, while such strong excursions in the density are not found below a power threshold, transitions to high confinement with somewhat different signatures are observed well after the onset of neutral beam injection. These "delta-T" transitions are characterized by a strong, rapid broadening of the ion temperature, and a modest increase in peaking of the electron density. These transitions were documented with the carbon poloidal rotation diagnostic to see if, like delta-n transitions, the paradigm of ExB shear suppression is connected with the bifurcation process. Preliminary analysis indicates that large increases in poloidal rotation are not seen with the delta-T transitions, in marked contrast to the delta-n transitions. The ExB shearing rate inferred from these measurements will be compared to predicted growth rates of the dominant instabilities to elucidate the similarities and differences between these two types of transitions.

The integration experiment aimed to combine with high-current supershots and high-li plasmas in D-T with the radiating mantle technique for controlling the power flux to the limiter. After a standard limiter conditioning campaign using both lithium pellets and the DOLLOP apparatus, a 2.65 MA, 5.6T supershot was taken with krypton injection during the neutral beam pulse. The peak NB power was 33 MW and the total NB pulse length 2.0s. Good confinement was initially achieved but it appeared that the amount of krypton was inadequate to prevent a severe limiter influx and a loss of confinement. This shot achieved a peak DT fusion power of 6.5 MW and a total DT yield of 7.1 MJ, the second largest achieved on TFTR. After a brief recovery campaign, the high li shot was attempted. With 32 MW of DT NBI this shot reached a peak fusion power of 7.8 MW (one of the highest performance high -li shots). This shot also suffered from a limiter influx after 0.3 s of heating. The lack of limiter conditioning was most likely due to the extensive L-mode campaign earlier in the week. Nevertheless, these experiments provided further information about the control of high performance discharges using the radiative mantle technique.

Even on the last day of operations, the availability and performance of all systems was exceptional with nearly all operating at and above design parameters. This is a tribute to the skill and hard work of the men and women working on TFTR.

Future Plans

No further tokamak experiments are planned on TFTR. Activities as part of the shutdown of the facility will begin today.

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