

TCV operational plan

Available number of Shots #31

Calendar Week 24 (12.06-16.06)

L-Mode Experiment. Ip scan, DN, Low density

1. Shape from 57088, $I_p = 245$ kA, Reverse Bt, density ramp from Line Average Density = 3.8×10^{19} @ 0.5 s to 11×10^{19} @ 1.6s, Bt = 1.43T. Plunge @ 0.65, 1.52
2. Repeat #1 with $I_p=330$ kA Bt=1.43T, same density ramp, same timing for plunges
3. Repeat #1 with $I_p=180$ kA, Bt=1.43T, same density ramp, same timing for plunges
4. Repeat #1 with $q_{95}=2.44$ as #2, adjust Bt consequently (Bt = 1.06T)
5. Repeat #3 with $q_{95}=2.44$ as #2, adjust Bt consequently (Bt=0.78T)
6. Shape and current from #1. Stop puffing once the divertor is formed to get low collisionality case. Include an ECRH power ramp from 0.9s (150 kW) till the end (500 kW)
7. Repeat #6 with density at intermediate level from #1 @0.65s and #6
8. Repeat density ramp of Shot #2 in DN configuration (Equilibrium from #53516 @ 1.55)
9. Repeat density ramp of Shot #3 in DN configuration
10. Repeat #1 in forward field
11. Repeat #3 in forward field

Calendar Week 43 (23.10-27.10)

1. Low collisionality case, model 116425. Exact repetition of 57425 up to 0.6s after that line integrated density is reduced to 0.8 finges
2. Model 116516 (based on 53516). $I_p = 190$ kA DND configuration from 0.65s, density ramp as 57437
3. Model 116517. I_p 330 kA DN density ramp as 57497
4. Model 116437. I_p 190 kA repeat the density ramp of 57437 in forward field
5. Model 116497. I_p 330 kA repeat the density ramp of shot 57497 in forward field
6. H-Mode plasma. Try to reproduce shot 55860. Plunges @ 0.5 and 1 s
7. Repeat point #6 with different plunges @0.7 1.15
8. Repeat point #6 add N seeding. Use seeding from half of the value of # 57822. Monitor target temperature evolution
9. Repeat #8 adjust seeding accordingly.
10. Contingency

Calendar Week 44 (30.10-03.11)

This so far is a tentative schedule. 4 shots of contingency are kept. They will be used for the determination of the best suitable scenario in terms of heating and fueling. In case all succesful repeat the best suitable scenario to get more robust statistics in terms of filaments

1. Repeat 58366 with NBH power ramp from 1s associated with the feed-forward gas fueling. Power from (200kW, 1s) to (800 kW, 1.4s). Adjust vertial position ($z=5$ cm)

2. Repeat #1 eventually adjusting power/density ramp. If additional power is needed use ECRH central heating.
If #1 succesfull then change stroking time
3. Repeat #1, reducing feed-forward gas while keeping best option for power ramp fomr #1-#2. Add N seeding and
monitor target temperature
4. Repeat #3 adjusting dosing rate and change stroking time
5. Contingency
6. Contingency
7. Contingency
8. Contingency

OLD UNUSED

Reference shot for Type I ELMy H-Mode from TCV15-2.3-1 #53352 with $Z=+8\text{cm}$, still compatible with NBI operation. The ELM frequency is 100Hz approximately

1. Repeat #53352 same senttting. 1MW NBI power from 0.8 to 1.2 s. At 0.82 s starts a
density ramp keeping the same rate as #1. At 1.2 second power ramp down for check ELMy regime
2. Repeat #11 adjusting the fueling accordingly. We include N seeding
3. Repeat #12 with best trade off between fueling and seeding
4. Repeat #53352 with probe plunge in L and H-mode. Check robustness of Probe signal in H-mode,
eventually adjust
maximum insertion
5. Repeat #53352 D2 density ramp once H-Mode is established.
6. Check maximum density achieved before H-Mode degradation or disruption. Density feedback to
this value during H-Mode. NBI power ramp down to check for ELMy regime
7. Repeat #3 for diagnostic purpouse
8. repeat #3 in the High-Density phase start N-seeding. Use seeding rate from Detachment experiment
in L-Mode as starting point
9. Evaluation of #6 in terms of divertor condition. Choose the right N-seeding values and repeat
10. Repeat #6, anticipate the NBI power, keep density and N-seeding after the H-L transition. Plunge also
in L-Mode
11. Repeat #7 for diagnostic purpouse
12. Repeat #8. If feasible decrease vertical position @ $Z=-8\text{cm}$