

# **Plasma Operation Issues for FIRE**

**Prepared and Presented  
by**

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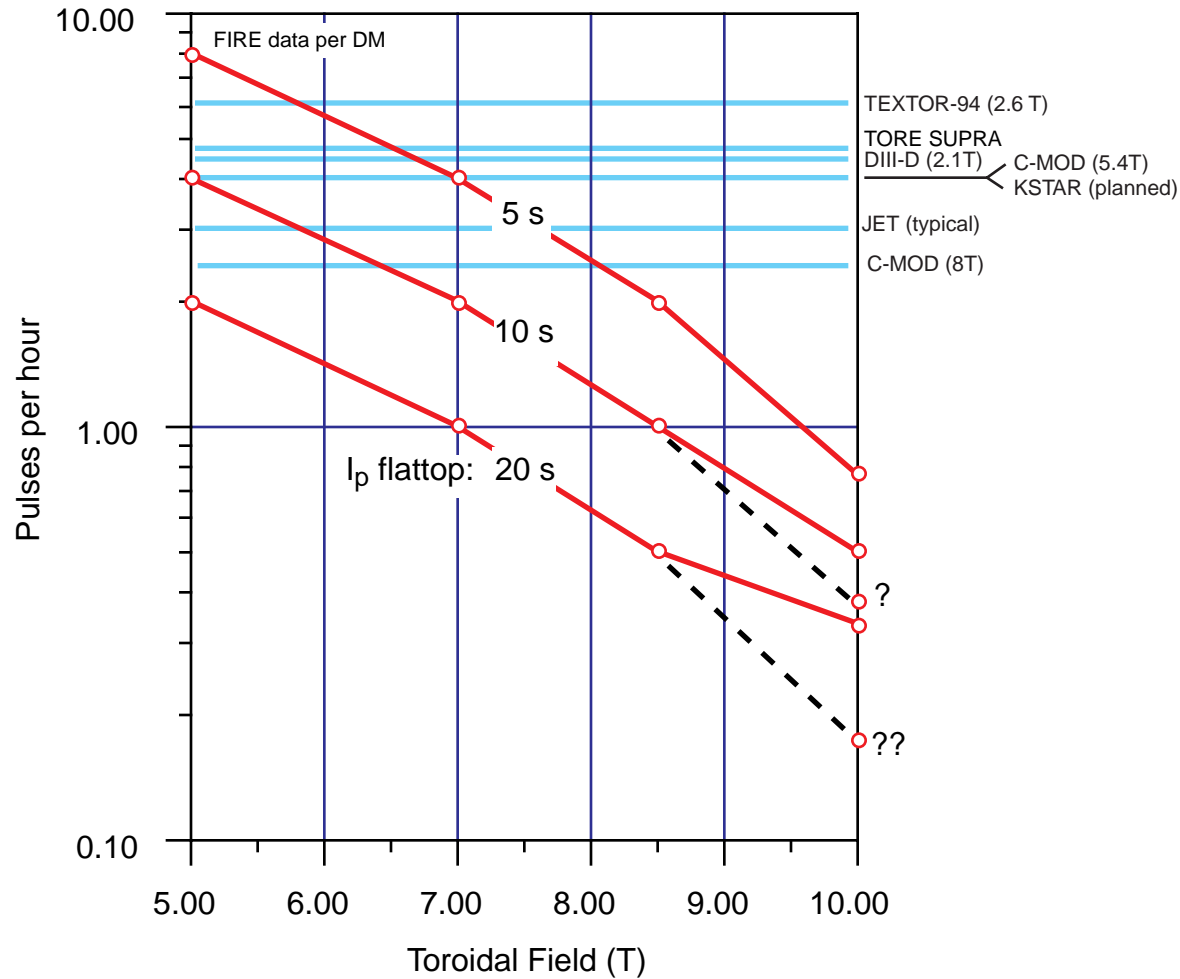
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# **Content**

- **Repetition Rate (pulses per hour)**
  - **Pulses per Year**
- **Wall Reconditioning**
  - **Discussion**

# Repetition Rate

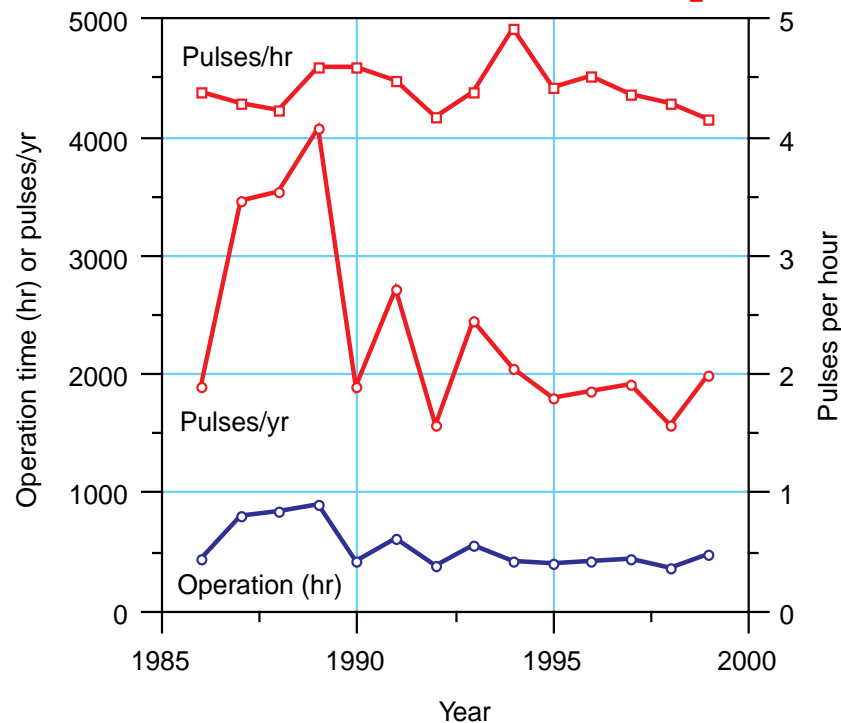
- FIRE repetition rate will be limited by TF recool:**



- Rate at 10 T ~ 0.1-x present 'large tokamaks'**

## Pulses per Year

- FIRE design basis: 30,000 pulses total, 3000 pulses (10 T)
- Allocating 3000 10-T pulses yields 300 pulses/yr
- Present tokamaks run ~2000 pulses/yr:



DIII-D operation data for 1986-1999

## Issues re: Pulses per Year

- Experiment = 1-3 day (8 hr) = 40-120 pulses
- Thrust or topic = campaign = 10 days = 400 pulses
  - ~ 5 campaigns = 1 year
- What will the limitations of 8 (full performance) pulses/day and 300 pulses per year in FIRE be?
- How scalable will  $\leq 7$ -T operation (without or with DT) be to 10-T or 12-T DT pulses?
- What will the effects of disruption recovery be?
  - Will 'single-pulse' diagnostics be available?
  - Can we conduct a wide-ranging physics study program in FIRE?