1. Purpose of Experiments
   Include immediate goal of the experiments, scientific importance and/or programatic relevance.
   Refer to any relevant program milestones or ITER R&D commitments.

   Calibrate diveror pressure gauges in a high pressure limit.

2. Background
   Discuss Physics basis of the proposed research, Prior results at Alcator or elsewhere, and any related work being carried out separately.

   Results of runs 940616 and 940617 indicate extremely high gas compressions in the divertor, reaching tens of mTorr D2, possibly up to a 100 mTorr. Previous calibrations of divertor gauge, performed as piggy-back to power-tests never exceed pressures of 7 mTorr. Other authors indicate that the gauge is strongly non-linear in the high pressure regime.

3. Approach
   Describe the methodology to be employed; explain the rationale for the choice of parameters, etc. Describe the analysis techniques to be employed in interpreting the data, if applicable. If the approach is standard or otherwise self-evident, this section may be absorbed into the Experimental Plan.

4. Resources

4.1 Machine and Plasma Parameters
   Give values or range for:

   **Toroidal Field**: 5.3 T (nominal for ’94 campaign)
   **Plasma Current**: no plasma, but some of the vertical coils fired
   **Working gas species**: D2
   **Density**: no plasma
Equilibrium configuration (if possible, refer to database equilibria): Need a steady state poloidal field of Bz between 0.4T and 0.5T, and Br between -0.2T and -0.3T at the location of the gauge (Z = -476mm, R = 793mm) during the TF flattop. These correspond to standard Ip = 600kA flattop of diverted equilibria, for example 940617013 or old 931025009.

Pulse length, typical current & density waveforms, etc. Refer to database or sketch desired waveforms: about 1 sec TF flattop

4.2 Auxiliary Systems

RF Power, pulse length, phasing: none

Pellet Injection (species): none

Impurity blow-off injection: none

Special gas puffing: machine prefill as high as possible, e.g. 1mTr, only ninja gas puffing, no hybrid puffing, all diagnostic gate valves closed, turbo pump gate valves may be closed if necessary

Other: FIZZLE DETECTOR DISABLED!

4.3 Diagnostics

List required diagnostics, and any special setup or configuration, e.g. non-standard digitization rate.

All gauges, all magnetics. Need only to use engineering, magnetics and edge (need not be entire) trees. Other trees can be turned off to limit data file size.

All diagnostic gate valves closed.

4.4 Neutron Budget

Estimate the neutron dose rate at the site boundary. Give basis for estimate. (Once some experience has been gained a standard formula will be provided for estimating dose rates.)

Zero

5. Experimental Plan

5.1 Run sequence plan

Specify total number of runs required, and any special requirements, such as consecutive days, no Monday runs, extended run period (10 hours maximum), etc.

2-4 shots total, each can be done on a different day as a piggy-back to other experimental program, e.g. last shot of a day.
5.2 Shot sequence plan
For each run day, give detailed specification for proposed shot sequence: number of shots at
each condition, specific parameters and auxiliary systems requirements, etc. Include contingency plans, if appropriate.

Some PF coils fired, breakdown deliberately avoided by both a spoiled field index and
a prefill pressure outside Pashen minimum. 2-3 ninja puffs during TF flattop, bringing
C-Mod up to 50 - 100 mTr in few steps.

The gas puffs should be prepared, tested, and calibrated on a maintenance day, off-line,
without firing a C-Mod shot.

6. Anticipated Results
Discuss possible experimental outcomes and implications. Indicate if the program may be expected
to lead to publications, milestone completions, improved operating techniques, etc. Indicate if
the experiments are intended to contribute to a joint research effort, or an external database.

Calibration necessary to analyze divertor neutral pressure data (e.g. 940616, 940617...),
specifically pressure compressions necessary for gaseous divertor studies. Possible non-
linearity of the gauge investigated.

7. References
Include references both to external and internal literature or communications which bear on this
proposal. See Section 2.

Niemczewski et al., RSI ’94 paper
Klepper et al., JVST ’93 paper
Haas, private communication