

Jim Lyons
11-8-4^{10/21/2011}

TRU Inventory Issues

Jim Lyons
Sierra Research, Inc
October 21, 2011
www.sierraresearch.com

From 2004 TRU ISOR

(page VII - 7)

U.S. EPA's May 23, 2003 proposal allows the use of a new steady-state test cycle for TRU engines (ref 40 CFR Part 89, Subpart G, section 1039.645). The proposed test cycle is intended to be more representative of the way TRU engines actually operate than the currently used 8-mode test cycle, which includes modes of operation that TRUs never use....

...Initial staff evaluation of modal engine certification data indicates that emission factors will be less for the proposed test cycle compared to the current test cycle. The amount of PM emission factor reduction ranges from 25 percent to 60 percent, depending on engine model. But, staff found that nitrogen oxide (NOx) emission factors may increase for some engines when using the proposed steady state TRU test cycle.

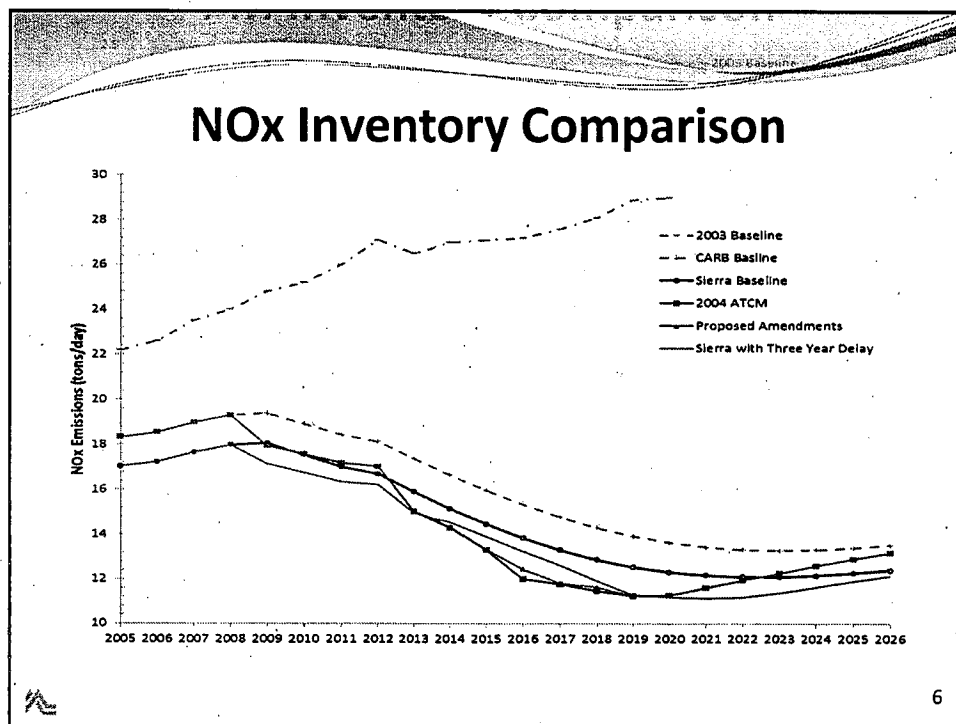
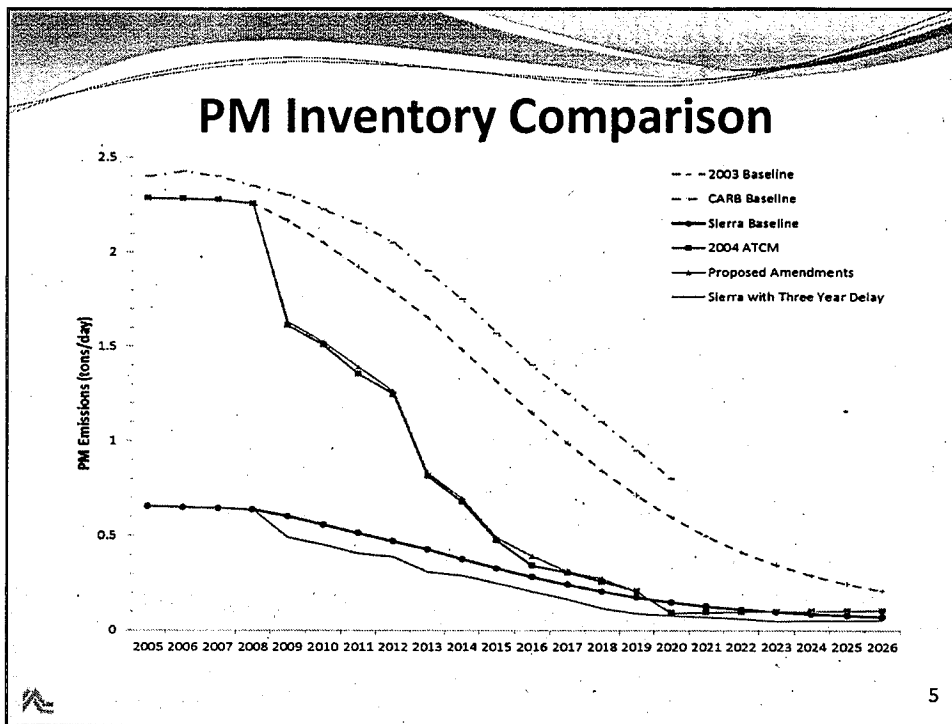
Staff supports the proposed TRU test cycle....

TRU Cycle Impacts

(Tier III – 35 hp, IDI Engine)

CARB EIGHT MODE CERTIFICATION CYCLE					CARB FOUR MODE CERTIFICATION CYCLE				
Mode	Load	WF	NOx (g/h*WF)	PM (g/h*WF)	Mode	Load	WF	NOx (g/h*WF)	PM (g/h*WF)
1	100%	0.15	17.96	0.38	2	75%	0.25	30.22	0.20
2	75%	0.15	18.13	0.12	3	50%	0.25	22.45	0.21
3	50%	0.15	13.47	0.12					
4	10%	0.10	2.94	0.10					
5	100%	0.10	7.76	0.89	6	75%	0.25	19.59	0.24
6	75%	0.10	7.84	0.10	7	50%	0.25	13.65	0.13
7	50%	0.10	5.46	0.05					
8	0%	0.15	1.18	0.03					
			74.74	1.79				85.91	0.78
			NOx (g/kWh)	PM (g/kWh)				NOx (g/kWh)	PM (g/kWh)
			5.85	0.14				6.41	0.06
					Ratio 4 mode/8 mode NOx =		1.10		
					Ratio 4 mode/8 mode PM =		0.42		

- ## Recommendations
- Direct staff to obtain modal certification data from engine manufacturers.
 - ❖ Submission of data already required under existing TRU regulation - Section 2477(d)(14), (e)(1)(A)1.a.1. and (e)(1)(A)2.a.1
 - Direct staff to revise inventory and reanalyze regulatory options.
 - ❖ Collection of modal certification data and inventory revisions should take no more than a few weeks.
 - Accurate inventory is vital to assessing regulatory impacts and cost-effectiveness.



TRU ATCM Cost-Effectiveness

- 2003 Staff Report = \$10-\$20/lb PM emissions eliminated
- 2011 Staff Report = \$83/lb PM emissions eliminated
- 2011 With Sensitivity Case Results = \$406/lb PM emissions

