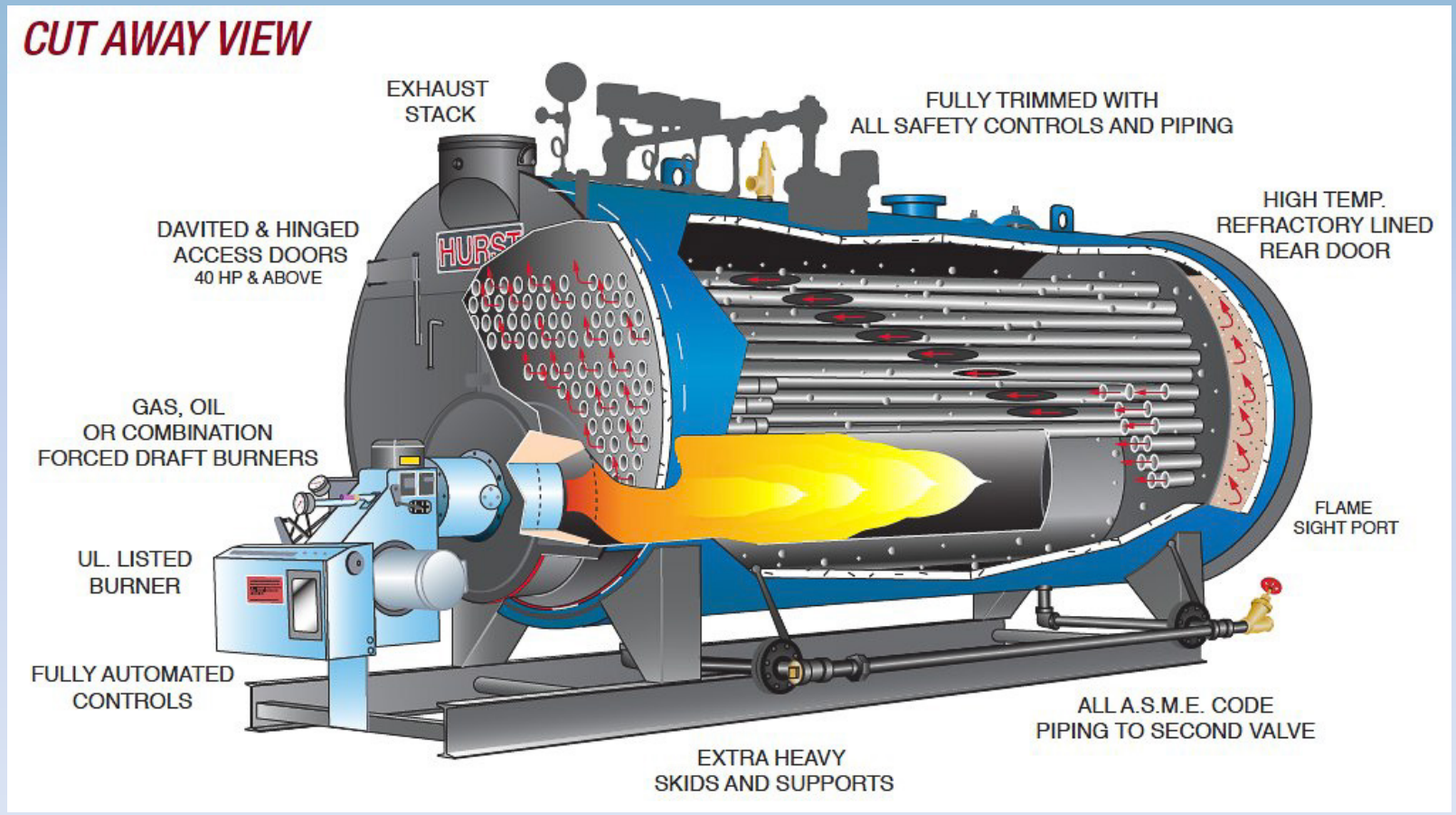
YOLO-SOLANO

AIR QUALITY MANAGEMENT DISTRICT

RULE 2.27: BOILERS

Public Workshop 1/31/2019

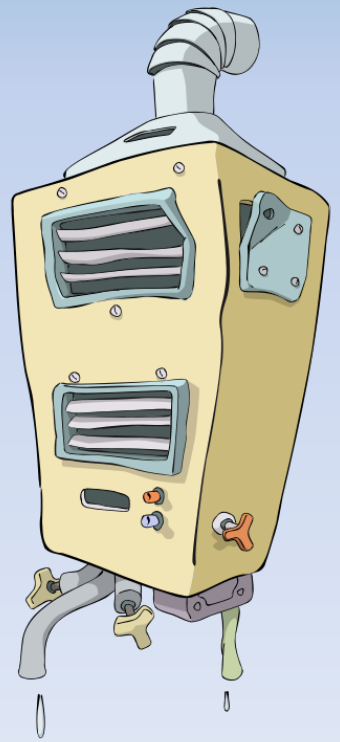


OVERVIEW

- Rule history
- Current rule standards
- Reasons for amending the rule
- Emissions inventory (who will be affected)
- Potential new standards
- Possible timeline

RULE HISTORY

- Rule 2.27 adopted October 27, 1993
- Adopted to meet Federal SIP and RACT as well as State BARCT requirements
- Rule required boiler operators to retrofit with low NOx burners
- Original implementation schedule
  - About 2 years to submit a plan and ATCs
  - Another 3 years to show full compliance
- District has been successful enforcing the rule over the past 26 years



CURRENT RULE STANDARDS

- Purpose is to minimize NOx emissions
- Rule 2.27 applies to units with rated heat input above 5 MMBtu/hr
- We have a separate rule 2.37 which applies to units smaller than 1 MMBtu/hr
- Exemptions
  - Electric utility boilers
  - Waste heat recovery boilers
  - Dryers
  - Cement/lime kilns, glass melting furnaces, smelters
  - Process heaters used less than 250 hours/year

CURRENT RULE STANDARDS

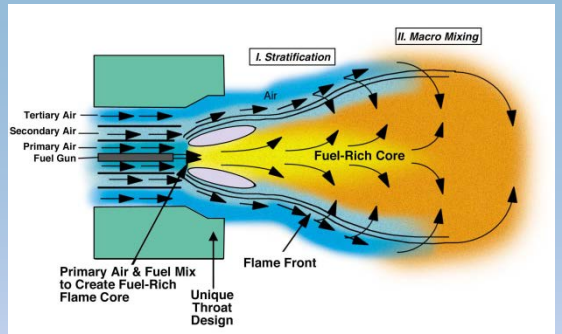
- Emission standards for most units
  - NOx standard of 30 ppm when burning gaseous fuel
  - NOx standard of 40 ppm when burning liquid fuel
  - CO standard of 400 ppm
- Requirement to source test or tune-up annually
- For low use units (less than 90,000 therms/yr), rather than comply with low NOx standard, can tune it up annually

REASON FOR AMENDMENTS

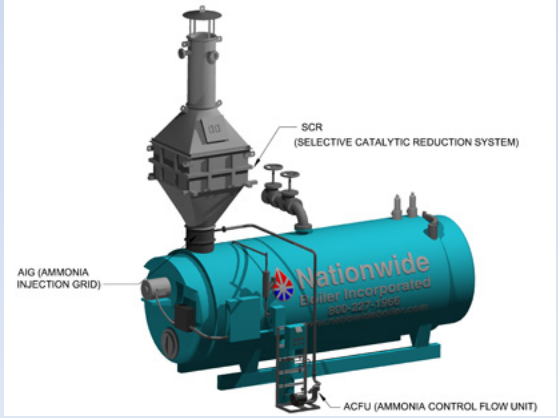
- District has planning commitments to get additional reductions from this category
  - 2009 Sacramento Regional 8-hour Ozone Attainment and Reasonable Further Progress Plan
  - State Triennial Plan (2015)
  - State All Feasible Measures and BARCT (AB 617)
- All other major Districts in State have amended their boiler rules

CONTROL TECHNOLOGY

- Most common method to comply will be to install low NOx burner
  - Might be able to retrofit burner in existing boiler
  - Might be more cost effective to replace whole boiler

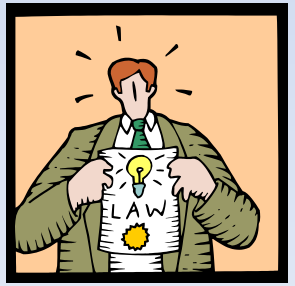


- For larger boilers, could install Selective Catalytic Reduction (SCR) system which has a catalyst and uses ammonia or urea
  - We have a few of these units already permitted



PROPOSED NEW STANDARDS

- NOx emissions standards based on available technology and other Districts' rules (gaseous fuels)
  - large (> 20 MMBtu/hr) boilers - 9 ppm
  - medium (5 - 20 MMBtu/hr) boilers - 15 ppm
  - small (≥ 1 - < 5 MMBtu/hr) boilers - 30 ppm
- NOx emissions standards (nongaseous fuels)
  - all heat input ratings - 40 ppm
- CO emissions standards
  - all heat input ratings and all fuel types - 400 ppm



OTHER DISTRICT COMPARISON

District	Boiler Rating (MMBtu/hr)	NOx Limit (ppm)	Effective Date
Sacramento	1 to 5	30	2007 to 2009
	5 to 20	15	
	> 20	9	
San Joaquin	0.4 to 2	20	2014
	2 to 5	9 to 12	New units installed after 2016
	5 to 20	15	2004 to 2007
	> 20	9	
Bay Area	2 to 5	30	2013 to 2015
	5 to 10	15	
	10 to 20	15	2012 to 2014
	20 to 75	9	
	> 75	5	
South Coast	< 2	20	2012 to 2014
	2 to 5	9	
	5 to 20 (Group III)	9	
	20 to 75 (Group II)	9	
	> 75 (group I)	5	2013

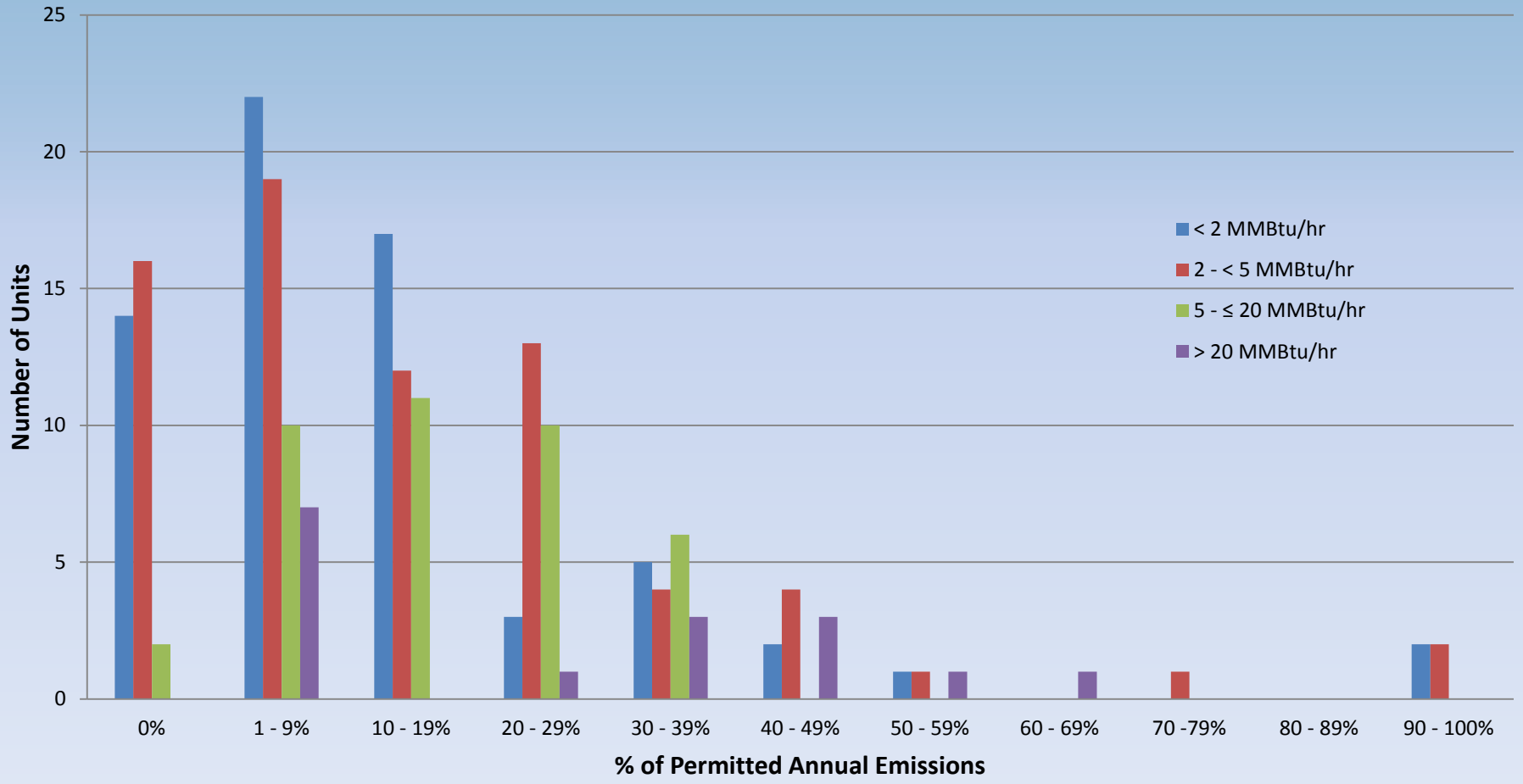
EMISSIONS INVENTORY

- 210 permitted boilers (among 68 organizations)
- 18 boilers are permitted for backup fuel oil
- 8 boilers permitted for propane
- 1 boiler permitted for landfill gas

Rating (MMBtu/ hr)	# of permitted units	2017 NOx Emissions (tons/yr)	# of units that are already ultra low NOx
> 20	16	25.49	6 @ sub 9 ppm
5 – 19.99	40	5.88	13 @ sub 15 ppm
2 – 4.99	81	10.70	30 @ sub 30 ppm
< 2	73	4.45	28 @ sub 30 ppm

Emissions Inventory

- 2017 reported usage breakdown
- Most boilers operate between 0 and 20%



TIMELINE

- Staff have been discussing potential rule changes with sources for the past 10 years
- Staff would like to bring the rule to the Board in April, 2019
- Notice of the hearing will be published in advance to give the public opportunity to submit written comments before the vote by the Board

CURRENT EXEMPTIONS

- Current rule - units with actual usage less than 90,000 therms for each of the 3 previous years must:
  - Operate with stack-gas oxygen levels less than 3%, or
  - Be tuned at least once every 12 months, or
  - Comply with the 30 ppm standard
- Complications in the current rule
  - Need to verify usage every year,
  - Rule doesn't specify how long you have to achieve compliance if you happen to exceed
  - No procedures for verifying O_2 level or ppm

PROPOSED EXEMPTIONS

- Maintain complete rule exemption for:
  - boilers used by electric utilities to generate electricity,
  - waste heat recovery boilers,
  - dryers,
  - cement and lime kilns,
  - glass melting furnaces and smelters
- New complete rule exemption for:
  - units with a rated heat input less than 5 MMBtu/hr installed prior to Jan. 1, 2020
- Exemption from emissions standards, testing, and tune-up requirements for:
  - process heaters used less than 250 hours per year
  - units under curtailment conditions provided curtailment fuels are not burned more than 200 hours per year

PROPOSED EXEMPTIONS

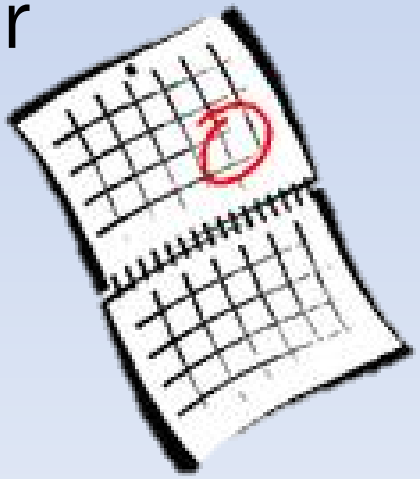
- Exemption from emissions standards and performance testing requirements for units with a permitted capacity factor of 4.0 percent or less

SOURCE TESTING

- > 20 MMBtu/hr – every 12 months
- 5 to 20 MMBtu/hr - every 24 months
- < 5 MMBtu/hr - initial portable analyzer test (not required for low-use or certified units)
- Certified units - regular tune-ups
- Units with a permitted capacity factor of 4.0 percent or less - regular tune-ups (or operation with stack gas oxygen at 3.00 percent or less)

COMPLIANCE SCHEDULE

- Jul. 1, 2019 – ATC applications for low use (4.0 percent annual capacity factor) exemption
- Dec. 31, 2019 – Written plan describing the method chosen to comply with emission standards
- Dec. 31, 2021 – ATC applications for modifications necessary to achieve compliance with rule requirements
- Dec. 31, 2023 – Demonstrate final compliance with all requirements



MONITORING

- Proposed revision requires a fuel meter for units > 20 MMBtu/hr
- Proposed revision requires either a fuel meter or hour meter for units < 20 MMBtu/hr

QUESTIONS

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