40 CFR Part 60 Subpart JJJJ (4J) Summary Sheet

Emission Testing Notification:
Unlike some of the previous testing that Air Hygiene may have performed for your company, 40 CFR Part 60 Subpart JJJJ (4J) has specific language relating to emission testing notification requirements. Emission testing notifications are referenced near the end of the 4J regulation in Table 3 in a specific reference to 60.8. In summary, a 30 day notification must be provided to the "administrator" prior to testing. There are various interpretations of this language for notification and on the meaning of "administrator".

Typically in the Code of Federal Regulations (CFR) a reference to "administrator" is intended to mean the Federal entity or applicable EPA regional office. For example, engines in Louisiana, Arkansas, Oklahoma, New Mexico, or Texas the EPA Region 6 office in Dallas, Texas would be the applicable EPA regional office. One opinion is that states do not have jurisdiction over this Federal rule and notification to the administrator means sending the test protocol and letter of notification only to the EPA regional office. Others believe the interpretation of "administrator" to mean the EPA or its designee, which would then be the State entities (e.g. Texas Commission on Environmental Quality [TCEQ]). Some have decided to send protocols and notifications to both the EPA and State entities and others have decided to send protocols and notification to the State only.

Air Hygiene's recommendation would be to play it safe and send notifications to both.

Other Notification to Consider (non-testing):
4J also requires notifications that center around facility construction dates as referenced in 60.4245(c) (page 12 of the "40CFR60 Subpart JJJJ" PDF file) which then references to 60.7(a)(1) which is printed in the margin of the same page. These notifications are not emission testing based, so do not require our testing protocols or input, but from talking with people in the field my understanding is that these notifications are difficult to provide due to the requirement in 60.4245(c)(3) for a serial number as many manufacturers do not provide a serial number when an initial order for a engine is placed which under the language of 60.42.30(a) [beginning of the regulation] corresponds with the date the construction commences.

Testing Requirements:
Testing requirements are somewhat similar to "typical" testing that you have contracted in the past with the exception of the VOC measurement requirements and the one hour test runs. For most 4J testing the scope is 3, 1-hour test runs monitoring for NOx, CO, VOCs, and O2. The VOC analysis methodology described in Table 2 of the regulation calls for:

"Methods 25A and 18 of 40 CFR part 60, appendix A, Method 25A with the use of a methane cutter as described in 40 CFR 1065.265, Method 18 or 40 CFR part 60, appendix A, Method 320 of 40 CFR part 63, appendix A, or ASTM D6348–03 (incorporated by reference, see §60.17)".

Air Hygiene is capable of conducting either of these methodology groups either with a VIG 210 VOC analyzer that incorporates the Method 25a and Method 18 technologies into a single analyzer or with a Method 25a total hydrocarbon analyzer coupled with an MKS FTIR analyzer utilizing the Method 320 test technology. Utilizing either methodology, Air Hygiene is able to provide you with real-time VOC results.

Applicable Engines:
Engine horsepower along with type (duty), fuel, and manufacture date all play into determining the applicability of 4J. Table 1 of the regulation provides a quick list of the emission limits for each category. The text version of these requirements begins in 60.4230(a)(1)-(5) [beginning of the regulation] with additional information in 60.4233 [What emission standards must I meet if I am an owner or operator of a station SI internal combustion engine].

If the manufacturer certifies an engine then all testing requirements are waived, per the Federal regulation. However, as mentioned above, certain States are also taking exception with this rule. **Air Hygiene**'s experience has been that manufacturers can only certify engines that would utilize their brand of spark plugs, their brand of filters, and be operated at all times under the laboratory like

conditions under which the certifications would be performed. As such, **Air Hygiene** have not heard of anyone with a certified engine that is greater than 500 hp.

Small engines (less than 100 hp) seem to be getting certifications, but the State of Oklahoma has decided to go above and beyond the rule and require at least an initial tests on all engines, regardless of manufacturer certifications. Fortunately, these engines are exempt from the VOC measurement requirements, as outlined in the Federal Register, attached as "FedReg 011808, JJJJ Preamble" in Table 3 on Page 6 of the PDF File, but still require the 3, 1-hour test runs.

On site testing considerations:

As always, providing reliable power in these remote locations can always be an issue. If you've been in the field with **Air Hygiene** this year you may have noticed our new Kubota diesel-fired, inner-cooled generators. We made this power source switch late in 2007 and are pleased to report that these generators, after almost a year of field trials, have proven themselves through both the heat of summer, the cold of winter, and everything in between that nature has provided.

Converting emission concentrations (e.g. ppm) to emission rates (e.g. lb/hr, g/hp*hr, tpy) is another important field testing consideration. 4J requires that stack exhaust flow be either physically measured utilizing Methods 1-4 or stoichiometrically estimated using Method 19 and a fuel flow meter. The Method 19 approach is easiest, provided that a fuel flow meter exist on each engine. The newer Caterpillar G3606 engines that are coming out seem to have a reliable fuel flow meter built into the control panel. We have seen it consistently read only slightly higher than independent fuel flow meters monitoring the same source. Unfortunately, we have not seen the same type of meter in the control panel of the newer Caterpillar G3516s.

To combat this issue some of our other clients have resorted to purchasing a portable fuel flow meter (turbine blade style), which they bring to each engine and valve into the metered side of the incoming fuel gas. In addition to the fuel flow meter this approach also requires a temperature gun and pressure gauge to measure the temperature and pressure of the gas coming into the meter. So far this seems to be a reasonable approach, but the turbine blade style of meter is subject to fouling especially as thread tape is used to help seal the valve connections.

Other clients have elected to support manual flow measurements on each engine. This approach requires a permanent stack extension off the muffler/catalyst bed with at least two test ports in the same horizontal plane that meet the appropriate EPA port location requirement (i.e. at least 2 stack diameters downstream from the bend in the muffler/catalyst bed and at least 0.5 stack diameters upstream from the exit to the atmosphere). Depending on the configuration of the air handler and the muffler/catalyst bed, the stack ports may be accessible by climbing up on the air handler, but other configurations may require a man lift to be available for manually measuring the flow.

Air Hygiene recommends the Method 19 approach be taken when possible. The stoichiometric approach typically results in stack exhaust flow rates that are anywhere from five to ten percent lower than the manual measurement approach. This is due to both an over dependence on oxygen content for the Method 19 calculations and the human error aspect coupled with the "puffing" of the engine for the manual measurement calculations.

Texas engines may be a special case considering their typical qualification under the Permit by Rule and their resulting Table 29s. The Table 29s in the past have allowed us to use manufacturer's specified fuel consumption (e.g. Btu/hp*hr) along with Method 19 calculations and a fuel gas analysis in lieu of measuring fuel flow with a fuel flow meter. This is a conservative approach considering that most engines would be somewhat de-rated as they were placed in the field due to altitude, piping, or other factors. However, TCEQ and/or the EPA may not consider the fuel consumption approach to be in line with the intent of the 4J requirements, so it must be detailed prior to testing in a test protocol for state/federal approval.

Summary:

Although this brief guide is not intended to be all inclusive for every potential scenario that may be encountered **Air Hygiene** hopes that it will help you to avoid at least some of the pitfalls that can be associated with the 4J regulations.