9.4 Inspection

For early detection of the commonly occurring problems, it is recommended that the stack be inspected periodically to enable the user of the stack to take appropriate measures to counteract such problems.

9.4.1 Frequency of Inspection. The frequency of inspections should be based upon climate, construction materials, type of construction, and the nature of use (e.g., fuel type, operating temperature, and operating schedule). This may be specified by the stack manufacturer; however, in the absence of such information, it is recommended that the stacks be inspected annually for the first 3 yr. The results of these inspections should then determine the frequency of future inspections.

9.4.2 Items of Inspection

(a) Exterior Inspection

(1) Shell Thickness. Ultrasonic devices for nondestructive thickness testing or core samples and drill tests for destructive testing may be used to measure the shell thickness. Depending upon the condition of the stack, one shell thickness reading for each portion of the stack height equal to the stack diameter is recommended. A record of the results shall be maintained for monitoring corrosion of the steel.

(2) Lining. This component of the stack is the most critical in terms of wear, cracks, leaks, and other deficiencies. Such deficiencies are often hidden by overlaying particulate deposits and, therefore, proper care shall be exercised to detect deficiencies. It is recommended that pH readings be taken throughout. pH readings may be taken using litmus paper or reagent(s) or by chemical analysis of representative samples of scrapings from lining surfaces.

(3) Particulate Accumulation. Accumulation of particulates such as combustion residue, fly ash, etc. on the stack wall and at the base of the stack provides a matrix for acid condensate.

(b) General Items. Deformation of any component of the stack due to thermal or other loading shall be noted to include stack cap, expansion joints, and test and instrument ports.

9.4.3 Inspection Procedure

(a) For thorough inspections, the stack shall be rigged with equipment allowing the inspector to traverse the entire height on the interior and exterior of the chimney. All rigging and scaffolding shall be in compliance with OSHA regulations.

(b) The full height of the stack shall be traversed, photographing general interior conditions at regular intervals with specific attention to defective areas.

(c) It is recommended that color photographs be taken for use in the report. Instant photographs may be taken as backups.

(d) Defective areas that may be found shall be charted and noted.

(e) The integrity of the lining shall be judged on a visual basis, supplemented by routine probing to determine hardness, soundness, and/or general conditions.

(f) Unlined steel stacks shall receive either nondestructive thickness testing using an acceptable ultrasonic device or destructive thickness testing using drilling or core sampling.

(g) The exterior inspection shall also include a thorough examination of all appurtenance items, such as anchor bolts, cleanout door, ladder, caps, lightning protection system, and any other hardware items.

9.4.4 Inspection Report. The scope of inspection work shall be specified by the stack owner. In the absence of such specifications, it is recommended that the stack inspection report have the following items:

(a) Identification and brief description of the stack.

(b) Description of the inspection procedures.

(c) Color photographs showing typical conditions as well as problem areas. Each photograph must be identified as to the location of the photograph as well as the description of what is shown in the photograph.

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