

SCOPE

- I 1.1 This practice covers procedures for the design of a plant and purchase of equipment to comply with both workplace and community noise criteria.
- I * 1.2 The Job Specification will specify **additional noise criteria** which are to apply to the plant. Such additional criteria may cover noise levels within the plant area (additional worker exposure locations) and at specified locations outside the plant area (community criteria).
- I 1.3 **An asterisk (*)** indicates that additional information is required or that additional information is furnished by the Purchaser. If a job is contracted, this additional information is furnished in the Job Specification.
- I 1.4 The **community noise criteria** are to meet local community noise regulations or ordinances, if any; and/or to minimize community noise complaints.
- I 1.5 The **workplace noise criteria** are to minimize the need for personal hearing protection and to ensure no employees are exposed to a time weighted average (TWA) noise exposure of greater than 85 dBA for an 8 hour shift or 82 dBA for a 12 hour shift.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 The following publications should be used with this practice.

"Noise and Vibration Control," L. L. Beranek, published by the Institute of Noise Control Engineering, 1988

"Noise and Vibration Control Engineering, Principles and Applications," L.L. Beranek and I.L. Ver (published by John Wiley & Sons, Inc. 1992)
- I 2.2 **The responsibility for meeting the noise requirements** specified herein shall be assumed by the contractor responsible for engineering, procurement, and construction of the plant.

DOCUMENTATION

- I 3.1 **Data and calculations** shall be furnished to the Owner's Engineer to substantiate that the plant design complies with the workplace and community noise criteria.

PLANT NOISE DESIGN BASES

- E 4.1 **Plant shall meet both community and workplace noise criteria**, specified in Sections 5 and 6.
- I 4.2 In order to meet the **community noise criterion**, it is possible that a greater noise reduction is required than just meeting the workplace noise criterion.
- E 4.3 The noise criteria shall be met for **normal and abnormal** (e.g., startup and shutdown) **operating conditions**.

COMMUNITY NOISE CRITERIA

- E * 5.1 Applicable **state or local community noise regulations** or ordinances shall be used as the community noise criterion.
- E * 5.2 In the absence of applicable state or local regulations, the maximum noise level contribution at the nearest community location (such as residential areas, school, or hospital) from continuous plant noise sources is listed below:

EXISTING NIGHTTIME NOISE LEVEL AT THE NEAREST COMMUNITY LOCATION, dBA	PLANT COMMUNITY NOISE CRITERION, dBA
Less than 50	45
Between 50 and 65	6 dBA below the Existing Level
Higher than 65	55

Notes:

- (1) Continuous noise sources are those in operation more than two hours per day.
- (2) Nighttime is between 2200 and 0700.
- (3) Existing nighttime community noise level should be reported as L90 (90 percent of the time the noise levels are higher than this level).

- E *5.3 Noise contributions from **intermittent noise** sources shall be evaluated separately from continuous noise sources. Noise criteria for intermittent operations, such as venting, shall be determined by the Owner's Engineer. A guideline to limit intermittent noise at the nearest community location is listed below:

INTERMITTENT NOISE LEVEL GUIDELINES	
Daytime (0700 - 2200)	5 dBA added to the community noise criteria for continuous noise sources
Nighttime (2200 - 0700)	Same as the community noise criteria for continuous noise sources

- E 5.4 Where there are no nearby communities and no applicable local community noise regulations, the plant design limit shall be based on workplace noise criterion.
- E 5.5 There shall be **no pure tone noise impact** from plant operations. Pure tone noise is defined as a narrow band component which is noticeable as a noise of distinguishable pitch, and which represents a dominant feature of the plant noise.

WORKPLACE NOISE CRITERIA

- E *6.1 The workplace noise criteria specify the noise limit for equipment at worker exposure locations, typically three feet from the equipment as described in [Table 1](#). The equipment noise limit for each equipment item shall be 85 dBA (the combined equipment noise levels would be 85-90 dBA at worker exposure locations). Under special conditions, 90 dBA can be used for isolated, offsite, unattended equipment items (such as those in tank farms).
- a. For equipment with more than one noise emitting source, such as a driver-gearbox-compressor combination, the noise limit applies for each component.
- E *6.2 In the following special areas, the noise levels shall not exceed the specified limits.

SPECIAL AREAS	NOISE LIMIT, dBA
Control Rooms and other continuously occupied areas	55
Routinely, but not continuously Occupied Areas (e.g., Smoking Area)	75

- E 6.3 **Maximum noise levels at any location** an employee can reasonably be expected to occupy while carrying out normal process or mechanical work functions shall not exceed **115 dBA** at any time.

PLANT NOISE DESIGN PROCEDURES

- I *7.1 Establish the project community noise criterion.
- I *7.2 Assess the project community noise impact using the workplace noise criterion identified in **Par. 6.1**.
- I *7.3 If the project community noise criterion is met, the equipment noise limit identified in **Par. 6.1** can be used for input to the Equipment Noise Data Sheet ([Table 2](#)) for equipment purchase.
- I *7.4 If the project community noise criterion is not met, the equipment noise limit identified in **Par. 6.1** has to be lowered appreciably before inputting to the Equipment Noise Data Sheet.

VENDOR EQUIPMENT NOISE DATA REQUIREMENTS

- I 8.1 The order of preference for obtaining the required noise data is as follows:
- a. From tests of an actual and/or a comparable piece of equipment in an environment remote from other noise sources (shop or field tests), or installed in an operating plant.
- b. From noise data obtained by tests on similar equipment and corrected for the actual equipment size and operating conditions. Both field data and correction procedure shall be reported.
- c. From calculation by theoretical or empirical techniques.
- I *8.2 **The maximum permissible noise level** for an equipment item at specified worker access positions will be supplied to the vendor on the Equipment Noise Data Sheet ([Table 2](#)). The noise level will be specified as an "A" weighted overall sound pressure level (dBA), unless required otherwise.