

15.1 Determination of Action Time

A very important reference for heat stress management for nuclear power plants is ref. 1. Many plants have adopted it as the basis for their procedures as far as heat stress say times are concerned. The following simple approach provides an estimate of action times under various conditions¹.

- A. Find clothing Adjustment Factor (AF) for WBGT from the following table:

<u>Clothing Ensemble</u>	<u>Adjustment Factor (AF)</u>	
	F	C
Work Clothes (WC)	0	0
Cloth Coveralls (CC)	6	3.5
Double Coveralls (DC)	9	5
Vapor Barrier (VB)	15	8.5
Water Barrier (WB)	11	6

Work clothes (WC) are the kinds of clothing acceptable for work when radiological or chemical anticontamination protection is not required.

Cloth coveralls (CC) are a clothing ensemble that is comprised primarily of one layer of clothing with long sleeves and closed neck. Head, hand and foot coverings may be included in the ensemble.

Double coveralls (DC) are a clothing ensemble that is comprised primarily of two layers of clothing with long sleeves and closed neck. One layer may be an untreated spun-bonded material (used as a particular barrier, and sometimes called "papers"). Head, hand and foot coverings are included in the ensemble.

Vapor barrier coveralls (VB) are a clothing ensemble that is comprised primarily of two layers of clothing with long sleeves and closed neck. The outer layer is a vapor barrier (impervious) materials such PVC, treated spun-bonded material, etc. Head, hand, and foot coverings are included in the ensemble.

Water barrier, vapor permeable coveralls (WB) are a clothing ensemble that is comprised primarily of one layer of clothing with long sleeves and closed neck. The fabric is a barrier to liquid water, but permeable to water vapor (e.g., GoreTex fabric). Head, hand, and foot coverings may be included in the ensemble.

- B. Calculate Adjusted WBGT (AWBGT): $AWBGT = WBGT + AF$

- C. Find Action Time for Adjusted WBGT from either of the following two graphs depending on the temperature units.

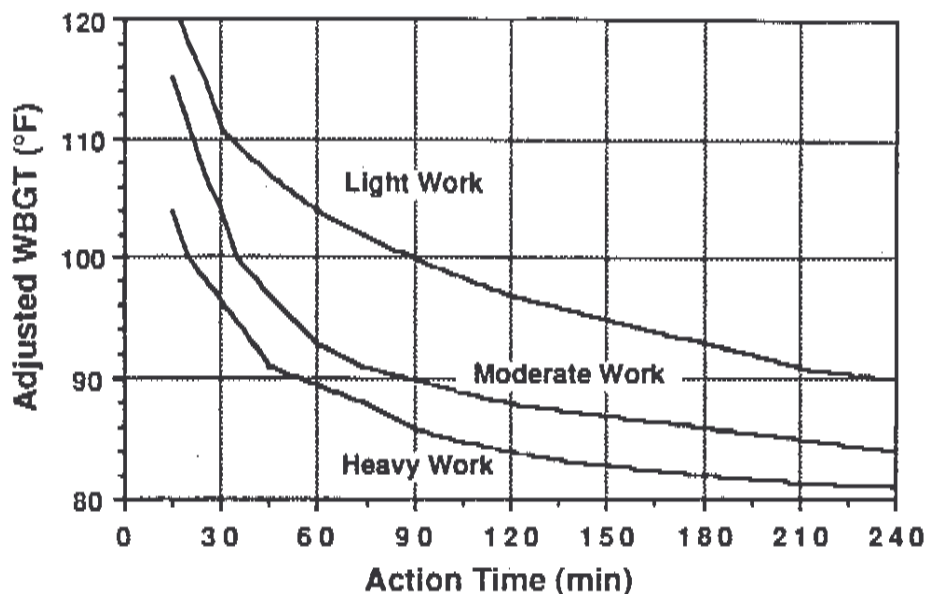
Light work are those average demands that are typical of job supervision, inspections, instrument repair and calibration, and area surveying.

Moderate work are those average demands that are typical of a system walk-down, valve alignments, valve and motor repairs, and light materials handling.

Heavy work are those average demands that are typical of manual gross decontamination, heavy materials handling, and extensive ladder and stair climbing.

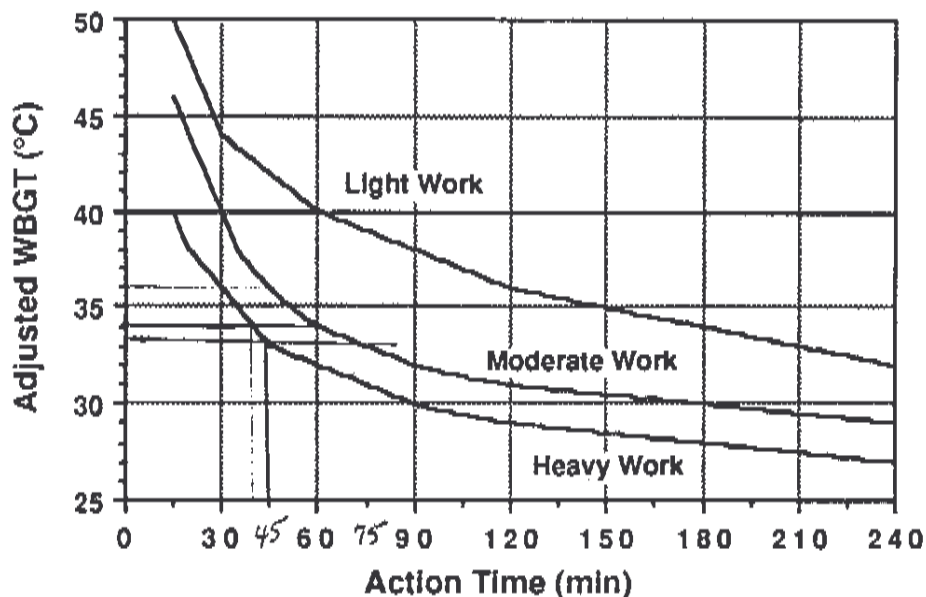
¹T.E. Bernard, Heat Stress Management Program for Power Plants, EPRI NP-4453-L, August, 1991, EPRI Distribution Center, 207 Coggins Drive, P.O. Box 23205, Pleasant Hill, CA 94523.

Manual Method of Calculating AT Using WBGT, Metabolism and Clothing Ensemble



Step 1: Start with Adjusted WBGT (WBGT + Adjustment Factor) on vertical axis and move right to the metabolism curve that best describes the work demands. (Example: 93°F to moderate work.)

Step 2: From metabolism curve, move down to Action Time axis, and read AT. (Example: AT = 45 min.)



¹"Health Factors Involved in Working Under Conditions of Heat Stress", World Health Organization Scientific Group, World Health Organization, Geneva, 1969.

²"EPA Ensures Oversight of Worker Safety and Health at Superfund Incinerator Sites", Environmental Protection Agency, Office of Emergency & Remedial Response, Washington, DC, EPA/540/F-93/040, September 1993.

³"Heat Stress and Heat Disorders", C. S. Leithead & A.R. Lind, OCLC # - 05795556, Philadelphia, 1964.