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MEMORANDUM FOR: Victor Benaroya, Chief
Chemical Engineering Branch
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FROM: Voss A. Moore, Chief
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Division of Human Factors Safety

SUBJECT: EMERGENCY LIGHTING ILLUMINATION STANDARDS

REFERENCE: TIA Task No. 83-87, Emergency Lighting Requirements, dated
September 23, 1983

In response to the referenced TIA, HFEB provides the following guidance on illumination standards for emergency lighting:

Emergency lighting must be considered in two contexts; (1) that required for personnel transit, and (2) that required for control of operations or safe shutdown.

Personnel transit should take into account the primary access routes from the control room to remote shutdown areas, and all egress routes from the control room, remote shutdown areas, and other areas where personnel are located during normal operations. These routes generally contain obstructions (e.g., piping, structures) which require visual detection to permit safe transit. The safe illumination level for these conditions, as recommended by the Illuminating Engineering Society of North America, is an absolute minimum of five (5) footcandles. In order to avoid tripping hazards and head injury, this illumination level should exist at both the floor and six-foot levels.

Minimum illumination for emergency operating conditions should be ten (10) footcandles at the task location. The task location is the panel surface where control is performed and displays are read. This illumination level should be incident on the panel with the operator in position for normal control reach. Location and type of emergency lighting should be such that glare on displays and labels is minimized and does not interfere with readability.

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Since eye adaptation to extreme changes in illumination (e.g., normal illumination to darkness) can take several minutes, emergency lighting should be automatically activated upon failure of the normal system. This will minimize the extremity of the change and maximize the speed of eye recovery.

Emergency lighting illumination levels and associated readability characteristics for operation in the control rooms are currently included in the HFEB review of the Detailed Control Room Design Review as required by Supplement 1 to NUREG-0737. Consideration is being given to clarifying Supplement 1 of NUREG-0737 to include remote shutdown areas in the Detailed Control Room Design Review.

If further information or more detail is required, the HFEB contact on this task is R. J. Eckenrode. Mr. Eckenrode may be reached at extension 24882.

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