

**INSPECTION CRITERIA FOR FIRE PROTECTION OPERATOR MANUAL ACTIONS**  
**3/6/03 CRITERIA VS. DRAFT INTERIM CRITERIA (10/17/03)**

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<p><u>Diagnostic Instrumentation</u>  Determine whether adequate diagnostic instrumentation, unaffected by the postulated fire, is provided for the operator to detect the specific spurious operation that occurred. Some licensees may have protected only those circuits specified in Information Notice 84-09. Additional instrumentation may be needed to properly assess a spurious operation. Annunciators, indicating lights, pressure gages and flow indicators are among those instruments typically not protected from the effects of a fire. Instrumentation should also be available to verify that the manual action accomplished the intended objective.</p>	<p><u>Available Indications</u>  Diagnostic indication, if credited to support operator manual actions, shall be capable of:</p> <ul style="list-style-type: none"> <li>● Confirming that the action is necessary;</li> <li>● Being unaffected by the postulated fire;</li> <li>● Providing a means for the operator to detect whether spurious operation of safety-related equipment has occurred; and</li> <li>● Verifying that the operator manual action accomplished the intended objective.</li> </ul>

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<p><u>Environmental Considerations</u>  Review environmental conditions the operator may encounter while accessing and performing the manual action. Radiation levels should not exceed normal 10CFR (Code of Federal Regulations) Part 20 limits. Emergency lighting should be provided as required in Appendix R, Section III.J, or by the licensee's approved fire protection program. Temperature and humidity conditions should be reviewed to ensure that temperature and humidity do not affect the capability to perform the manual action. Fire effects should be reviewed to ensure that smoke and toxic gases from the fire do not affect the capability to perform the manual action.</p>	<p><u>Environmental Considerations</u>  Environmental conditions encountered while accessing and performing operator manual actions shall be demonstrated to be consistent with the following human factor considerations for visibility and habitability:</p> <ul style="list-style-type: none"> <li>● Emergency lighting shall be provided as required in Appendix R, Section III.J, or by the licensee's approved fire protection program, [e.g., lit with 8-hr battery-backed emergency lighting], and sufficient lighting shall be provided for paths to and from locations requiring any actions.</li> <li>● Radiation shall not exceed 10 CFR Part 20, Section 20.1201, limits</li> <li>● Temperature and humidity conditions shall be evaluated to ensure that temperature and humidity do not adversely affect the capability to perform the operator manual action. [See, e.g., NUREG/CR-5680, vol. 2, "The Impact of Environmental Conditions on Human Performance;" or require that licensee provides rationale for temperature/humidity not being factors adversely affecting performance.]</li> <li>● Fire effects shall be evaluated to ensure that smoke and toxic gases from the fire do not adversely affect the capability to access the required equipment or to perform the operator manual action.</li> </ul>

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<p><u>Staffing</u>  Review licensee shift staffing to determine whether adequate qualified personnel are available to perform the required manual actions and safely operator the reactor.</p>	<p><u>Staffing and Training</u>  There shall be a sufficient number of plant operators, under all staffing levels, to perform all of the required actions in the times required for a given fire scenario. The use of operators to perform actions shall be independent from any collateral fire brigade or control room duties they may need to perform as a result of the fire. Operators required to perform the manual actions shall be qualified and continuously available to perform the actions required to achieve and maintain safe shutdown. A training program on the use of operator manual actions and associated procedures during a postulated fire shall demonstrate that operators can successfully achieve these objectives.</p>
<p><u>Training</u>  Determine whether operator training on the manual actions and the procedure is adequate and current.</p>	
<p><u>Communications</u>  If manual action coordination with other plant operations is required, then communications capability must be protected from effects of a postulated fire.</p>	<p><u>Communications</u>  To achieve and maintain safe shutdown, adequate communications capability shall be demonstrated for operator manual actions that must be coordinated with other plant operations, with this communications capability continuously available.</p>

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<p><u>Special Tools</u>            If special tools are required, determine whether tools are dedicated and available from accessible nearby locations.</p>	<p><u>Special Equipment</u>            Any special equipment required to support operator manual actions, including keys, self-contained breathing apparatus (SCBA), and personnel protective equipment, shall be readily available, easily accessible and demonstrated to be effective.</p>
<p><u>Procedures</u>            Review procedural guidance to ensure that it is adequate and contained in an emergency procedure. Operators should not rely on having time to study normal plant procedures to find a method of operating plant equipment that is seldom used.</p>	<p><u>Procedures</u>            Procedural guidance on the use of required operator manual actions shall be readily available, easily accessible and demonstrated to be effective.</p>
<p><u>Accessibility</u>            Review accessibility. If a ladder or other special access equipment is needed, verify the availability. Determine whether an operator can reach the required location without personal hazard.</p>	<p><u>Local Accessibility</u>            All locations where operator manual actions are performed shall be assessed as accessible without hazards to personnel, with controls needed to assure availability of any special equipment, such as keys or ladders, being demonstrated.</p>

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<p><u>Verification and Validation</u>  Determine whether the manual actions have been verified and validated by plant walkdowns using the current procedure. Ensure that the licensee has adequately evaluated the capability of operators to perform the manual action in the time available before the plant will be placed in an unrecoverable condition.</p>	<p><u>Demonstration</u>  The capability to successfully accomplish required operator manual actions within the time allowable using the required procedures and equipment shall be demonstrated using the same personnel/crews who will be required to perform the actions during the fire; documentation of the demonstration shall be provided.</p>
<p>N/A</p>	<p><u>Complexity and Number</u>  The degree of complexity and total number of operator manual actions required to effect safe shutdown shall be limited such that their successful accomplishment under realistically severe conditions is assured for a given fire scenario. The need to perform operator manual actions in different locations shall be considered when sequential actions are required. Analyses of the postulated fire time line shall demonstrate that there is sufficient time to travel to each action location and perform the action required to support the associated shutdown function(s) such that an unrecoverable condition does not occur.</p>

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N/A	<p><u>Equipment Pre-conditions</u>  Possible failure modes and damage that may occur to equipment used during a fire shall be considered to the extent that the equipment's subsequent use could be prevented, or at least made difficult.  Credit for using equipment whose operability may have been adversely affected by the fire due to smoke, heat, water, combustion products or spurious actuation effects shall account for such possibilities (e.g., over-torquing an MOV due to a spurious signal, as discussed in Information Notice 92-18).</p>