

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

June 15, 1978

IE Circular No. 78-11

RECIRCULATION M-G SET OVERSPEED STOPS

In August 1977, personnel at the Cooper Nuclear Station reported finding the recirculation M-G set overspeed mechanical and electrical stops at 112 percent and 120 percent of rated core flow. The licensee had believed the set point to be 107 percent for these stops, although a search of Station preoperational and startup test records could not establish the actual initial set point. Subsequent to this finding, the licensee set the mechanical stop at 102 percent of rated core flow.

The technical specifications require that the Minimum Critical Power Ratio (MCPR) be maintained greater than 1.22 for 8 X 8 fuel. The technical specifications further require MCPR to be above a minimum of 1.22 times K_f whenever operating at less than rated flow. The correction factor K_f is always greater than or equal to 1.0 and thus increases the MCPR limit when at less than rated flow. Technically, this factor increases the required MCPR thermal margin in the event a recirculation M-G set speed control failure would occur and allow the recirculation pump to overspeed. The lower the initial core flow, the more severe is the flow transient, thus K_f increases as actual core flow is decreased. The K_f factor is read from a curve included in the technical specifications.

A family of K_f curves is given in the figure in the technical specifications. The proper curve to use is the curve corresponding to the set point of the manual flow control overspeed stop (the M-G set mechanical stop). A lower set point of the overspeed stop results in a small K_f correction factor for a given core flow, as the flow transient on an M-G set speed control failure is less severe. Thus, it can be seen that by using a lower curve (e.g., 107 percent curve) than that required by the actual overspeed stop set point (believed to have been set at 112 percent), a nonconservative K_f correction factor was being used.

The M-G set overspeed stops were set during the preoperational test program by a General Electric Company startup engineer. The stops were checked by a GE preoperational test procedure. This procedure did not include a requirement to specifically record the stop setting. It

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included only a requirement to verify that the stop setting had been made. It appears likely that these same procedures, and perhaps the same engineer, were involved in the preoperational/startup test programs at several other sites.

All holders of operating licenses for Boiling Water Reactor plants employing recirculation M-G sets should be aware of the potential for improperly or undocumented settings on recirculation M-G set speed stops. It is recommended that the following be considered in your review:

1. Facility records should be searched to determine if the actual existing set point on the recirculation M-G set overspeed mechanical stops is positively established.
2. If the setting of the mechanical and electrical overspeed stops is in doubt, then steps should be initiated to determine the setting or additional conservatism should be included in the determination of K_f .
3. The actual K_f being used for the process computer calculations in the determination of MCPR limits should be verified to be appropriate to (or more conservative than) the actual setting of the recirculation M-G set mechanical overspeed steps.

This circular is also issued to holders of BWR Construction Permits for information or use as appropriate to assure that steps are taken during the preoperational test program to confirm that the M-G overspeed stops are set properly and that the proper K_f will be used with the process computer.

No written response to this circular is required. If you require additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

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LISTING OF IE CIRCULARS ISSUED IN 1978

Circular No.	Subject	Date of Issue	Issued To
78-01	Loss of Well Logging Source	4/5/78	All Holders of Well Logging Source Licenses
78-02	Proper Lubricating Oil for Terry Turbines	4/20/78	All Holders of Reactor OLS or CPs
78-03	Packaging Greater Than Type A Quantities of Few Specific Activity Radioactive Material for Transport	5/12/78	All Holders of Reactor OLS, CPs, Fuel Cycle, Priority I Material and Waste Disposal Licenses
78-04	Installation Error That Could Prevent Closing of Fire Doors	5/15/78	All Holders of Reactor OLS or CPs
78-05	Inadvertent Safety Injection During Cooldown	5/23/78	All Holders of Reactor OLS or CPs
78-06	Potential Common Mode Flooding of ECCS Equipment Rooms at BWR Facilities	5/23/78	All Holders of Reactor OLS or CPs
78-07	Damaged Components of a Bergen-Paterson Series 25000 Hydraulic Test Stand	5/31/78	All Holders of Reactor OLS or CPs
78-08	Environmental Qualification of Safety Related Equipment at Nuclear Power Plants	5/31/78	All Holders of Reactor OLS or CPs
78-09	Arcing of General Electric Company NEMA Size 2 Contactors	6/5/78	All Holders of Reactor OLS or CPs

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Circular No.	Subject	Date of Issue	Issued to
78-10	Control of Sealed Sources Used in Radiation Therapy	6/14/78	All Medical Licensees in Categories G and G1