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NUCLEAR REGULATORY COMMISSION

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January 30, 1997

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CERTIFICATE HOLDER: United States Enrichment Corporation
Paducah Gaseous Diffusion Plant
Paducah, KY

SUBJECT: CERTIFICATION EVALUATION REPORT: APPLICATION
DATED SEPTEMBER 30, 1996, CASCADE CELL TRIP
FUNCTION

BACKGROUND

By letter dated September 30, 1996, the United States Enrichment Corporation (USEC) requested an amendment to the proposed certificate of compliance for the Paducah Gaseous Diffusion Plant (PGDP). The request was based on the proposed certificate because the final certificate was not issued until November 26, 1996. The request is to revise limiting specific values for battery performance specified in Technical Safety Requirement (TSR) 2.4.4.12 and to change the air pressure specifications in the Safety Analysis Report (SAR). This amendment request was submitted in accordance with Compliance Plan Issue 48.

DISCUSSION

The accident analysis contains cascade cell-related scenarios in which operating personnel respond to certain process conditions and alarms by de-energizing (tripping) the process motors. This action brings the cells to below atmospheric pressure, thereby limiting the release. To initiate a cell shutdown, the DC control and trip power circuit must be operable. TSR 2.4.4.12 was put in place to establish the operability requirements for cell trip. At the time the TSR was developed, the specific values established for battery performance and air pressure requirements for the air circuit breakers were based on practice and did not have a documented basis. Compliance Plan Issue 48 required that these values be reconfirmed and documented and that an amendment be submitted to revise the TSR and/or SAR if the values needed to be revised. Specifically, USEC is seeking to increase the limiting value for battery voltage, clarify the battery specific gravity, and expand the basis for TSR 2.4.4.12. USEC has also provided SAR changes to reflect revised limits for air pressure for the air circuit breakers. Each change is discussed below.

The Limiting Condition of Operation for the cascade cell trip function requires the DC control power and air pressure for cell trip of UF₆ stage motors to be operable. One of the abnormal conditions is when the DC voltage is less than 200 volts, another is when the air header pressure feeding a group of "000" air circuit breakers is less than the minimum required to actuate the breaker. Both of these parameters have daily required surveillances. One of the other surveillances is a check on the specific gravity of the cells.

The minimum required operating voltage for critical DC control components required for cell trip ranges from 40 to 200 VDC. The manufacturer's minimum voltage rating on the batteries is 210 VDC. The proposed increase from 200 to 210 VDC is consistent with the manufacturer's recommendation and allows for line loss. A value of 210 VDC at the output of the battery charger should be sufficient to assure that the necessary operating voltage is available to trip a cell. The proposed change modifies the value in the TSR and in the TSR basis statement.

The current surveillance for specific gravity of the battery cell requires the value be ≥ 1.180 . The specific gravity is dependent on the temperature of the cell and should be adjusted to a standard temperature prior to comparison to the limit. The proposed change to the TSR surveillance requirement adds the need for this temperature correction to eliminate the effect of the dependency. The specific gravity would be corrected to 77°F prior to comparing the measured value to 1.180.

The SAR (§3.9.1.3.2) currently contains three different minimum air pressure values for the C-333 and C-337 cells. The minimum pressure assures operation of the air-operated opening mechanism on the air-operated circuit breakers. The current limits of 185 psig and 112 psig have been increased to 190 psig and 118 psig to include a pressure margin above the minimum setpoint, thus increasing the margin of safety. The SAR also currently contains a pressure limit of 225 psig for certain cells. Upon further checking, it has been determined that the 225 psig value refers to breakers that are not required for cell trip. The breakers with the 225 psig pressure requirement are 5000 amp breakers supplying the 14 kV switchhouse bus; the air-operated circuit breakers necessary for cell trip are cell feeder breakers with pressure limits of 190 psig and 118 psig. The revised SAR section correctly groups the cells to reflect the actual supply breaker configuration.

ENVIRONMENTAL REVIEW

Issuance of an amendment to Certificate of Compliance GDP-1 to revise the cell trip parameters is subject to the categorical exclusion provided in 10 CFR 51.22(c)(19). Therefore, neither an environmental assessment nor an environmental impact statement is required for the proposed action.

CONCLUSION

The proposed changes to TSR 2.4.4.12 and SAR §3.9.1.3.2 provide more conservative limits for battery voltage and air circuit breaker air pressure, improve the surveillance requirements for measuring battery cell specific gravity, and establish better bases for the limits. These changes provide better assurance that the cell trip function will be available if required thus increasing the margin of safety. The staff recommends that these changes be approved.

Principal Contributors

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