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SUBJECT: Informs of revision to 900221 ltr in response to RAI re  
 post-fire safe shutdown methodology at util. Installing  
 reflash capability in control rooms is cancelled.

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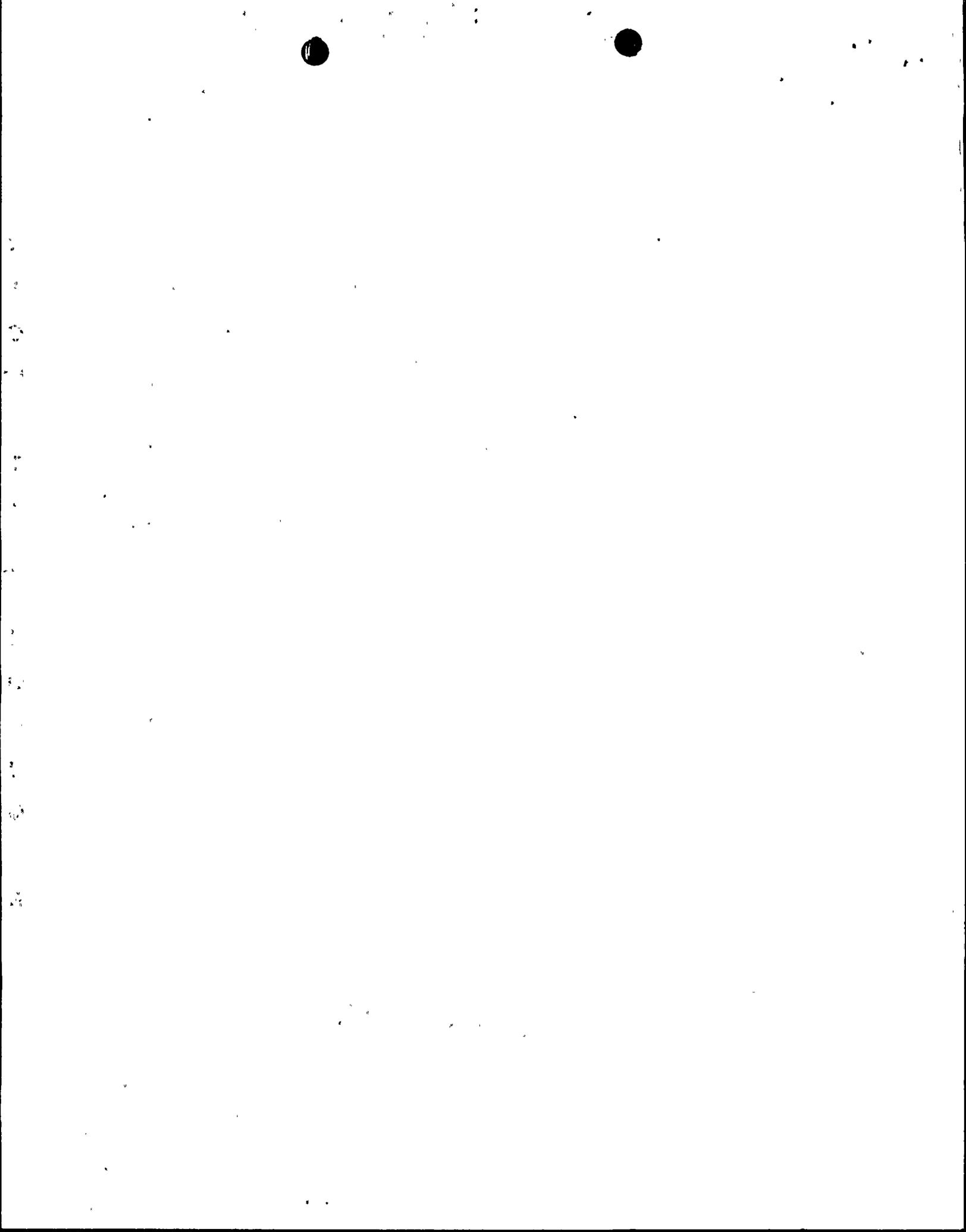
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AEP:NRC:0692CU

Donald C. Cook Nuclear Plant Units 1 and 2  
Docket Nos. 50-315 and 50-316  
License Nos. DPR-58 and DPR-74  
REVISION OF PLANS TO INSTALL REFLASH  
CAPABILITY FOR THE CONTROL ROOM FIRE ANNUNCIATOR PANELS

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Attn: W. T. Russell

August 24, 1994

Dear Mr. Russell:

The purpose of this letter is to revise previous information submitted February 21, 1990, (AEP:NRC:0692BT), in response to a September 14, 1989, NRC Request for Additional Information (RAI), regarding post-fire safe shutdown methodology at Donald C. Cook Nuclear Plant. On page 13, of Attachment 1, of AEP:NRC:0692BT, we committed to install "detection system reflash capability in the control rooms", and indicated that this "modification is being developed with a target completion by December 1991." The commitment was not required by the RAI but, at that time, was believed to be a desirable enhancement.

On December 2, 1991, we submitted AEP:NRC:0692BY, and noted therein that the fire alarm reflash project had to be rescheduled for completion by December 31, 1994, due to the complexity of the project. After extensive review, we have concluded that the cost of installing reflash capability will not have a commensurate safety benefit, and may not be technically desirable. This conclusion was based on operator interviews, fire alarm system walkdowns, review of the Fire Probabilistic Risk Assessment (PRA), review of the Detailed Control Room Design Review (DCRDR), engineering evaluations of the fire annunciator panels, and a review of fire detection corrective and preventive maintenance procedures. Attachment 1 to this letter provides detailed justification to support cancelling the reflash modification.

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Mr. W. T. Russell

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AEP:NRC:0692CU

In addition, this is a Cost Beneficial Licensing Action (CBLA). The lifetime cost savings associated with this CBLA are approximately \$2,421,000, as detailed in Attachment 2.

Sincerely,

*for*   
E. E. Fitzpatrick  
Vice President

cad

Attachments

cc: A. A. Blind  
G. Charnoff  
J. B. Martin  
NFEM Section Chief  
NRC Resident Inspector - Bridgman  
J. R. Padgett

ATTACHMENT 1 TO AEP:NRC:0692CU

REVISION OF PLANS TO INSTALL REFLASH  
CAPABILITY FOR THE CONTROL ROOM FIRE ANNUNCIATOR PANELS

During a November 1989 meeting with NRR and Region III staff at Cook Nuclear Plant, the maintenance and surveillance of our Technical Specification (T/S) 3/4.7.10, "Fire Related Assemblies," was discussed. A miscellaneous issue was discussed regarding fire alarm system circuit supervision. During this discussion, NRC staff inquired if the alarm system had a "reflash" capability. In response to the NRC inquiry, we indicated that reflash capability would be installed.

On February 21, 1990, we submitted AEP:NRC:0692BT, in response to NRC Request for Additional Information regarding post-fire safe shutdown methodology. On page 13 of Attachment 1, we committed to install "detection system reflash capability in the control rooms" and indicated that this "modification is being developed with a target completion by December 1991." On December 2, 1991, we submitted AEP:NRC:0692BY and noted therein that the fire alarm reflash project would be rescheduled for completion by December 31, 1994, due to the complexity of the project.

In accordance with our commitment to install reflash on the control room fire panels, a plant modification (12-PM-1015) was opened. This plant modification was subsequently closed when it was realized that the scope of work was significantly more resource intensive than initially envisioned and would require a corporate (AEPSC) design change. Subsequent reviews and evaluations have now determined that reflash cannot be installed for the fire panels for less than a minimum cost of approximately \$2,421,000 (1993 dollars, for both units excluding the simulator).

The fire annunciator panels in the Cook Nuclear Plant control rooms have a simple operating sequence consistent with the rest of the control room annunciator panels. When the input to an annunciator drop changes from normal to abnormal, the drop will begin to flash and sound an audible alarm. The operator acknowledges the alarm by pushing the associated drop (which is also a push button switch) which silences the audible alarm and results in a standing (solid) visual alarm. When the condition clears, the light will flash again, along with an audible signal, until the drop is depressed.

The Cook Nuclear Plant control room annunciator system was designed to provide plant monitoring functions and to address human factors concerns. This was achieved, in part, by the utilization of shared alarm point inputs (multi-input drops). This enables each drop to accept multiple process signals to provide necessary information without distracting operators with

redundant or "low-level" information. In general, multiple alarm point inputs are logically grouped by system function and/or physical location (e.g., fire protection alarms for all four reactor coolant pumps are grouped together onto one annunciator drop). When the first abnormal condition occurs, the alarm point can return to normal only after all associated input conditions have returned to normal. Subsequent abnormal conditions would not "reflash" that alarm point while a previous abnormal condition still exists.

Cook Nuclear Plant utilizes multi-input drops in accordance with NUREG-0700 and the AEP system control room design philosophy. Multi-input alarms without reflash are used if the quantity, sequence or combination of alarm inputs does not change the priority of the alarm, the identity of the alarm condition is available at a local panel or on a hard copy printout (or status light), and it does not significantly affect the nature of or the time required to implement the initial corrective action in response to the alarm condition.

Unit control room fire annunciator panels consist of 150 drops. Drop #41, labeled FIRE, is a red drop (first priority alarm) and was designed to clearly indicate actuation of fire protection systems. This drop is only energized in conjunction with another drop which identifies the actuating equipment or to signal that the other control room has received their drop #41 alarm. Other fire panel drops are either red (first priority alarm) indicating system actuation, amber (second priority) for abnormal conditions, or white (third priority) which also indicate system trouble.

The annunciator response procedures indicate the areas and/or equipment associated with each drop. For multi-input drops which monitor a large number of zones, the procedures require that, if the annunciator or fire detection zone light remains illuminated, then the operator must monitor the status lights at the top of the fire protection panel once per hour (administratively, once per 30 minutes) for other alarms. The status lights tell the operator which fire protection zone has the abnormal condition. The requirement to monitor the fire panel is reiterated in the "Standing Fire Detection Alarm" data sheet which is used to document and track standing alarms on a 30 minute frequency.

In addition, standing alarms associated with Technical Specification required detectors located outside of containment require hourly fire watch patrols to inspect the affected zone(s). Detectors located inside containment have different parameter

monitoring requirements such as monitoring containment air temperatures. Also, certain drops, such as drop #94 "REACTOR COOLANT PUMP FIRE OR ABN," simultaneously annunciate abnormal conditions on their associated system panel. For example, a fire condition illuminating drop #94 will have an associated alarm on the reactor coolant pump (RCP) panel (located in the control room) indicating the specific affected RCP.

The control room operators are trained not to tolerate standing alarms and faulted detector circuits are promptly repaired and well maintained under a comprehensive surveillance and maintenance schedule in accordance with Technical Specifications. Standing abnormal alarms are tracked on a daily basis by management and action is taken to keep the number of standing alarms to a minimum.

Plant procedures and Technical Specifications require that fire watches be established for inoperable equipment and systems that could affect the safety of the plant. The utilization of local fire indicating/control panels by fire watch personnel provides added assurance that those areas which are monitored by multi-input drops in the control room are being adequately surveyed to preclude potential masking of abnormal fire protection conditions.

The Detailed Control Room Design Review (DCRDR) examined all multi-input drops and the annunciator response procedures to determine if reflash and/or printout capability would be needed or advantageous. The conclusion of the DCRDR was that no reflash of multi-input alarms was required and that the benefits of reflash would not be cost justified. Irrespective of this conclusion, an effort was made during the DCRDR to address the need to add alarms to the Plant Process Computer (PPC) in lieu of splitting multi-input alarms or installing reflash circuits and, it was concluded that adding alarms to the PPC would not, in general, be of value based on operations procedures and the overall control room annunciator design.

In conclusion, the integrated use of the control room fire panel along with the associated status lights, the local fire annunciator panels, the annunciator response procedures, and other control room annunciator panels, provides the necessary information to identify different alarm signals associated with multi-input drops. In addition, the comprehensive surveillance

and maintenance of detector circuits and the low probability of automatic detection system failure, further supports the conclusion that reflash capability will not have a significant plant safety benefit.

Based upon these reviews, the installation of reflash capability for the control room fire annunciator panels clearly will not provide a significant reduction in plant risk. In addition, installation of reflash capability is not required for compliance with 10 CFR Part 50 Appendix R, for licensing commitments pursuant to NFPA compliance, or for compliance with the guidance provided in Appendix A to BTP APCS 9.5-1 and our response to the BTP dated January 31, 1977.

To support the above evaluations, we have also reviewed the results of the Individual Plant Examination of External Events (IPEEE) Fire Analysis completed in April 1992. Based on the results of this evaluation, it is concluded that reflash capability will not impact the results of the fire Probabilistic Risk Assessment (PRA). Installation of reflash capability will not reduce the fire induced contribution to core damage frequency for Cook Nuclear Plant.

Finally, in accordance with 10CFR50.59 and the guidance provided in NSAC-125, an unreviewed safety question determination was performed. It was concluded, therein, that cancellation of the reflash modification will not constitute an unreviewed safety question per 10CFR50.59(a)(2), nor does it constitute a significant hazard to the health and safety of the public.

ATTACHMENT 2 TO AEP:NRC:0692CU

COST BENEFICIAL LICENSING ACTION (CBLA)  
REVISION OF PLANS TO INSTALL REFLASH CAPABILITY  
FOR THE CONTROL ROOM FIRE ANNUNCIATOR PANELS

**Regulatory Requirement:**

A commitment was made in AEP:NRC:0692BT and AEP:NRC:0692BY, to install reflash capability for the control room fire annunciator panels.

**Effect of Requirement:**

Installation of reflash capability for the control room fire annunciator panels will make these panels inconsistent with the other control room panels, and may result in a human factors concern. Additionally, reflash capability will not result in a significant reduction of plant fire risk.

**Rationale for Regulatory Change:**

The availability of fire protection defense-in-depth measures ensures plant fire safety. These defense measures include the widespread use of fire detection and fixed suppression systems throughout the plant, the availability of manual fire suppression equipment, e.g., portable extinguishers and hose stations, the existence of a trained plant fire brigade, and the generally low fire loadings present throughout the plant.

Based on the justification provided in Attachment 1 and defense-in-depth strategies, installation of reflash will not provide a reduction in plant fire risk commensurate with the cost.

**Approximate Cost of Requirement:**

The minimum cost to install reflash capability for the control room fire panels is \$2,421,000 (1993 dollars). This cost does not include any software changes, seismic supports for cable/conduit routing, modifications to the simulator, or replacement of window drop boxes.



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