

PDR (copy)



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555

August 20, 1986

AEOD/P603

MEMORANDUM FOR: Harold R. Denton, Director, NRR
 Denwood F. Ross, Jr., Acting Director, RES
 James M. Taylor, Director, IE
 Regional Administrators

FROM: C. J. Heltemes, Jr., Director
 Office for Analysis and Evaluation
 of Operational Data

SUBJECT: TRENDS AND PATTERNS ANALYSIS OF ENGINEERED
 SAFETY FEATURE ACTUATIONS AT COMMERCIAL
 U.S. NUCLEAR POWER PLANTS

Enclosed is a report of a trends and patterns analysis of engineered safety feature (ESF) actuations which occurred during the last six months of 1984 at commercial U.S. nuclear power plants. The investigation documented in this report was limited to those ESF actuations which involved systems other than the reactor protection system (RPS). RPS actuations were the subject of a companion study, AEOD P504.

Based on the analysis and evaluation of these actuations, it was apparent that the majority of the ESF actuations were unnecessary and that the rate of these actuations could be decreased by (a) reducing the number of equipment failures during normal operation, (b) reducing the number of personnel errors during maintenance and testing, and (c) reducing spurious actuations due to electrical noise spikes.

Nine units were identified as being of particular concern because they appear to be experiencing repeated unresolved actuations which could ultimately challenge continued equipment operability and proper personnel response. These units were: Byron 1, Callaway 1, LaSalle 1 and 2, San Onofre 2 and 3, Sequoyah 1 and 2, and WPPSS 2.

Finally, the wide variety of ESF systems and the differences in the types of ESF actuations (including variations in immediate safety significance) make comparisons among units very difficult. Limiting the actuations included in the statistics to more significant events such as safety injections (which are more or less comparable across plants) does not seem practical because such events are rare and little discrimination in performance would result either among plants or over time for a given plant.

8609160314 860820
PDR ORG NEXD PDR

The distribution of ESF actuation rates among plants (i.e., the vast majority of plants have fairly low rates and, only 25% or so have relatively high rates) and the variety of ESF actuations suggest a two-step strategy for using ESF actuations as a performance indicator: first, to use a value of 10 ESF actuations in a 6 month period as an alert level (plants with a value below this frequency are deemed acceptable with no further analysis made); and secondly, to perform a detailed examination of the circumstances for the plants exceeding the threshold with unacceptable performance being frequent actuations as a result of ineffective corrective actions. Sustained operation (e.g., two consecutive 6 month periods) with a high rate of ESF actuations may be indicative of a willingness to accept ESFs that are not performing as intended.

Additionally, further study should focus on the specific units found to have high actuation rates and continuing problems, in order to verify that effective corrective actions are being taken.

We are placing a copy of this final report in the Public Document Room. If you have any questions regarding this matter, please feel free to contact Bob Dennig (24490) or Marc Harper (24480) of my staff.

Original Signed by
 C. J. Heltemes, Jr.
 C. J. Heltemes, Jr., Director
 Office for Analysis and Evaluation
 of Operational Data

Enclosure:
 As Stated

cc w/enclosure:
 See Attached

Distribution:
 PTB SF MHarper CHeltemes
 PTB CF RDennig
 AEOD SF MWilliams
 AEOD CF FHebdon
 PDR

OFC	:PTB	:PTB	:DD/AEOD	:D/AEOD	:	:	:
NAME	:MHarper rb	:RDennig	:FHebdon	:CHeltemes	:	:	:
DATE	:8/1/86	:8/1/86	:8/19/86	:8/20/86	:	:	:

cc w/enclosure:

V. Stello, EDO
J. Roe, DEDO
T. Rehm, AO/EDO
J. Sniezek, DEDROGR
E. Brach, DEDROGR
H. Thompson, NRR
R. Bernero, NRR
T. Speis, NRR
W. Russell, NRR
G. Holahan, NRR
M. Miraglia, NRR
G. Arlotto, RES
F. Gillespie, RES
E. Jordan, IE
S. Schwartz, IE
J. Partlow, IE
J. Shea, IP
H. Faulkner, IP
D. Humenansky, OCM
K. Raglin, RTC
K. Murphy, RI
E. Schweibinz, RIII
SRI, Byron 1, RIII
SRI, Callaway 1, RIII
SRI, LaSalle 1, RIII
SRI, LaSalle 2, RIII
SRI, San Onofre 2, RV
SRI, San Onofre 3, RV
SRI, Sequoyah 1, RII
SRI, Sequoyah 2, RII
SRI, WPPSS 2, RV