

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATORY
SUPPORTING AMENDMENT NO. _____ TO FACILITY OPERATING LICENSE
NO. DPA 51

ARKANSAS POWER & LIGHT COMPANY
ARKANSAS NUCLEAR ONE - UNIT 1
DOCKET NO. 50-313

Introduction

By teletype dated August 26, 1977, Arkansas Power &
Light Company (AP&L) requested an emergency change to the
Technical Specifications for Arkansas Nuclear One - Unit 1 (ANO-1).
The proposed change would allow operation of ANO-1 for
30 days without the hydrogen purge system ~~in~~ operational.

Discussion and Evaluation

The hydrogen purge system, ~~which~~ consists of two physically
separated, independent systems, each incorporating ^a HEPA filter
and charcoal adsorber to remove particulates and iodine from
the containment atmosphere after a Loss of Coolant Accident
(LOCA). The system is operated manually to maintain
hydrogen concentration less than 3.5%
and thus avoid the possibility of an explosive hydrogen concentration.

According to Section 6.6 of the ANO-1 Final Safety Analysis Report (FSAR), hydrogen concentration within containment would reach 3.5% in 11.5 days. APEL further calculated that the dose at the Low Population Zone (LPZ) would be 2.0 rem thyroid and 0.5 mrem whole body, assuming a very conservative 50 cubic feet per minute (CFM) continuous purge. In actuality the system would not be utilized continuously, but rather on a "duty cycle", purging when necessary to lower the hydrogen concentration. In fact, the AEC's own Safety Evaluation, written pursuant to licensing of ANO-1 and dated June 6, 1973, stated that calculated doses at the LPZ were less than 1 rem, both whole body

from hydrogen purge alone.
and thyroid for the course of the accident situation,
Total course of accident doses (LOCA) at the LPZ
were 62 Rem (thyroid) and 5 Rem (whole body), which
were well within the 10 CFR 100 limits of 300 Rem
thyroid and 25 Rem whole body.

Because the charcoal adsorber only
(FSAR 6.6.3.(f)) is given credit for a LWR moderator
Factor (DF) of 10, its total loss would not increase
for doses at the exclusion boundary
the LPZ doses appreciably. This same conclusion holds

In addition to this consideration, the NRC has for
some time been reviewing the entire subject of hydrogen
generation and has concluded that the original
assumptions which resulted in the ANO-1 5%
metal-water reaction [FSAR 6.6.1(b)] were far too

As a result,
conservative Regulatory Guide 1.7 Revision 1, September
1976, was issued to replace Safety Guide 7 in providing
guidelines for a realistic, yet still conservative assessment
of post-LOCA hydrogen generation. We are convinced that,
using assumptions
contained in Regulatory Guide 1.7, hydrogen generation
for ANO-1 would be such that purge would not be
necessary for a period in excess that time necessary to
assure the purge filter are ^{operable.}

This same reassessment has been reflected in
the ^{latest} revision of the Babcock and Wilcox (B&W)

Standard Technical Specifications (STS), which
allows 30 days ^{reactor} operation with no ^{operable} hydrogen purge system,
even in those plants with less than 2 hydrogen
recombiners (ANO-1 has none). In fact, most new

facilities have ~~being~~^{been} licensed with either hydrogen recombiners or one hydrogen purge system (ANO-1 has 2 separate systems).

Because the doses attributable to the loss of the hydrogen purge system will not cause ANO-1 to exceed the 10 CFR 100 limitations, and because the proposed change is in accordance with the latest guidelines of the Standard Technical Specifications, we have found the proposed change acceptable.

Richard P. Sullivan
8/26/77