



February 4, 1992

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Subject: Arkansas Nuclear One - Unit 2
Docket Nos. 50-368
License Nos. NFP-6
NUREG 0737 Item II.F.1 Attachment 6
Hydrogen Analysis Capability

Gentlemen:

Entergy Operations' letter dated February 5, 1991 (2CAN029106) committed to implement modifications on ANO-2 to ensure a representative sample of containment atmosphere hydrogen concentration could be obtained within 30 minutes of the initiation of safety injection following an accident. These modifications are to be implemented during the upcoming 2R9 refueling outage currently scheduled to begin in August, 1992. This commitment was based upon the NRC's rejection, transmitted in NRC letter dated November 30, 1990 (OCNA119022), of Entergy Operations' earlier request for relief from the 30-minute sample time requirement of NUREG 0737 Item II.F.1 Attachment 6 as proposed in letter 0CAN019008 dated January 9, 1990.

Since our most recent submittal, Entergy Operations has completed the scoping phase of the hydrogen monitoring system upgrade project and is currently developing a detailed design change package. Procurement documentation has been initiated for necessary components.

Several options were evaluated during the scoping phase of this design change project. All of the options considered meet the NUREG 0737 30-minute sample requirement. Included among them were:

- Replacement of the current 500-feet of 2-inch and 25-feet of 3/4-inch seismically mounted piping with 3/8-inch seismically mounted stainless steel tubing. This would reduce the largest sample line volume from 11.15 cubic feet to less than 1 cubic foot. This option was estimated to cost approximately \$1 million.
- Replacement of the existing seismically qualified sample pumps with customized, high capacity parallel pump skids at a cost of approximately \$900,000.

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- Replacement of the sample pumps and installation of an auto-start to the pumps on a containment isolation valve override signal. This option was estimated to cost approximately \$1.5 million.
- Replacement of the sample piping with 3/8-inch tubing as described above and installation of an auto-start to the sample pumps on a containment isolation valve override signal. Also included would be the upgrade of the existing hydrogen analyzers. This option was estimated to cost approximately \$2.2 million.
- Selection of a new sample point at elevation 405' as opposed to the current sample point at the top of the containment dome at elevation 543'. Utilize existing spare solenoid valves and 3-foot section of piping attached to these solenoid valves inside of the containment. The spare solenoid valves are currently tied into the hydrogen sample header inside the containment building. This option will eliminate approximately 260 feet of 2-inch sample piping inside containment (from elevation 405' to elevation 543'). This option is predicated upon studies which show equal mixing of hydrogen inside the containment building following an accident. Enhancements to this option included auto start of the hydrogen sample pumps on a safety injection actuation signal or a containment isolation actuation signal and removal of the containment isolation signals to the existing sample line solenoid valves. Along with the elimination of the containment isolation signal will be the installation of area radiation monitors at the hydrogen sampling panels. The radiation monitors will read out and alarm in the control room. Should high radiation levels be detected, indicating a failure of the sample line boundary, isolation of the appropriate hydrogen sample solenoid valve can be accomplished from the control room. The redundant train would be available for sampling. This modification, including enhancements, was estimated to cost \$492,000.

Other more complicated options were also explored. The last option discussed above, including the described enhancements was selected due to the reduced scope of construction required, overall lower cost, its capability to automatically initiate independent of operator action and its relatively quick response time. With this option, a representative sample of containment hydrogen can be obtained within 15 minutes of a safety injection actuation signal. This is well within the 30-minute requirement of NUREG 0737.

Due to the high cost of these modifications, Entergy Operations believes it is incumbent upon us to further explore the need for monitoring containment hydrogen concentrations within 30 minutes of a safety injection actuation signal. As part of the NRC letter of November 30, 1990, the author of the safety evaluation indicated, "During a LOCA scenario where it is postulated that significantly higher levels (than those considered for the design basis accident) of hydrogen gas may be or may have been generated (such as a TMI-type accident), it will be necessary for plant operators to have early indication of hydrogen concentration in containment in order to help determine what is happening

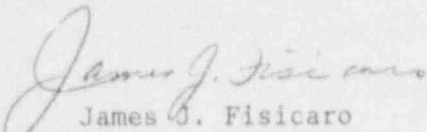
to the plant, so that the operators may take timely action to mitigate the accident." ANO's previous evaluations of this issue was based upon design basis assumptions. From the NRC's Safety Evaluation, it is clear that the NRC position is based upon the occurrence of events which create containment conditions beyond those expected to occur as a result of a design basis accident.

To further explore the need for hydrogen monitoring data in a beyond design basis scenario, Combustion Engineering performed a study entitled, "Monitoring Hydrogen Gas in Containment During the Early Phases of a Severe Accident". This study was conducted on behalf of ANO in conjunction with other CE owners who have shown an interest in the technical requirement associated with hydrogen monitoring. The study, which is attached, presents a strong technical argument and basis which questions the need for hydrogen monitoring data during the early phases (within 90 minutes of initiation) of even a severe accident like that at TMI. Given the information presented in this technical study and the high cost to upgrade the hydrogen monitoring system to meet the 30-minute monitoring requirement, Entergy Operations requests the Staff's review of the attached report and further requests that a meeting be conducted in February, 1992, between the NRC and interested CE owners to discuss any comments or concerns associated with the report. If, as a result of the NRC's review, it is determined that the CE report is technically justified and would be an acceptable basis for an exemption request to the 30-minute criteria of NUREG 0737, ANO would cease our current design activities and formally submit an exemption to the 30-minute sampling requirement of NUREG 0737.

The above information has been discussed with the ANO-2 NRR Project Manager. If what we have proposed is an acceptable approach to the NRC, please contact me to arrange a meeting date. If you have any questions in the interim, please feel free to contact my office.

In closing, I should point out that we are currently committed to install the necessary modifications to allow hydrogen sampling in accordance with the 30-minute requirement of NUREG 0737 during the upcoming ANO-2 refueling outage. Resources are currently being expended in this effort. We request the NRC's consideration of the position presented in the attached report. We believe it justifies our current sampling capability and if acceptable to the NRC, would preclude the expenditure of substantial funds for the planned modifications.

Very truly yours,


James J. Fisicaro
Director, Licensing

JJF/DEJ/sjf
Attachment

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