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 HUNTER, R.S. Indiana & Michigan Electric Co.
 RECIP. NAME: RECIPIENT AFFILIATION
 DENTIN, H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards description of post-accident containment hydrogen monitoring sys being installed per TMI Item II.F.1.6.
 Concerns should be resolved compatible w/811223 schedule for sys operability & qualification.

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 TITLE: Response to NUREG-0737/NUREG-0660 TMI Action Plan Rgmts (OLRs)

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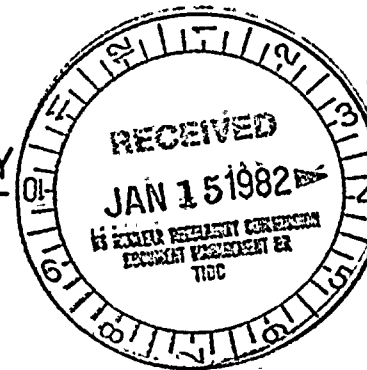
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NEW YORK, N. Y. 10004



January 11, 1982
AEP:NRC:00631

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
NUREG-0737, ITEM II.F.1.6 POST-ACCIDENT HYDROGEN MONITORING

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

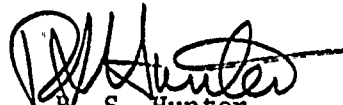
Dear Mr. Denton:

The Attachment to this letter contains a description of the Post-Accident Containment Hydrogen Monitoring System (PACHMS) being installed in accordance with Item II.F.1.6 of NUREG-0737.

We are in the process of resolving concerns relative to documentation of seismic and environmental qualification of the stepdown transformers utilized in the PACHMS. We anticipate resolution of these concerns in a time frame compatible with the schedule for system operability and qualification contained in our AEP:NRC:00652 letter dated December 23, 1981.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,


M. S. Hunter
Vice President

/os

cc: John E. Dolan - Columbus
R. W. Jurgensen
W. G. Smith - Bridgman
R. C. Callen
G. Charnoff
Joe Williams, Jr.
NRC Resident Inspector at Cook Plant - Bridgman

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Attachment to AEP:NRC:00631
Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
NUREG-0737, ITEM II.F.1.6 Post-Accident Hydrogen
Monitoring System-Design Description

Each Unit of the Donald C. Cook Nuclear Plant is provided with a Post-Accident Containment Hydrogen Monitoring System (PACHMS) designed for use following a hypothetical loss of coolant accident. The PACHMS is capable of analyzing a sample of the containment atmosphere within thirty minutes of receipt of a safety injection signal and can monitor hydrogen concentration in the 0-30 percent (by volume) range.

The PACHMS can take samples from nine locations within the reactor containment building, seven in the upper compartment, and two in the lower compartment. These locations provide the capability for representative sampling of the reactor containment building for hydrogen during post-accident conditions. After analysis the sample is returned to the containment.

The nine hydrogen sample lines penetrate the containment wall independently, each with containment isolation valves. They then header together into a line to the PACHMS hydrogen analyzer panels. There are solenoid-operated isolation valves on the sample inlet and outlet lines of each hydrogen analyzer panel.

Each Unit's PACHMS is comprised of two sampling-analyzing-control trains. Each train has two subsystems -- the hydrogen analyzer panels, and the remote control panels. These trains are shown schematically in Figure 1. Each train is supplied power from a separate Class 1E power supply.

Each hydrogen analyzer panel consists of the hydrogen analyzer, associated calibration gas systems, sample pump to transport the containment air sample to and from the analyzer, and auxiliary components. The hydrogen analyzer panels for each unit are located outside the containment wall in the "controlled access" area on elevation 612' of the Auxiliary Building.

The hydrogen analyzer equipment is mounted in 72" H x 30" W x 30" D rigidly-constructed, enclosed cabinets with penetrations at the top for the sample inlet and outlet lines, calibration and reagent gases, and electrical penetrations. The hydrogen analyzer panels were manufactured by Comsip, Inc. of Whittier, California and are environmentally and seismically qualified to IEEE 323-1974 and IEEE 344-1975, respectively.

The hydrogen analyzer operates on the principle of thermal conductivity. The instrument has a dual range scale - 0 to 10 percent and 0 to 30 percent hydrogen by volume. The analyzer has an accuracy of +2 percent of full scale, a repeatability of +1% of full scale, and a speed of response of 90 percent of the reading in less than 60 seconds.

The calibration (hydrogen) and reagent (oxygen) gas cylinders for the calibration and operation of the hydrogen analyzers are located on elevation 587' in each Unit's main steam accessway room of the turbine building. This area was selected to facilitate gas cylinder replacement from a "low-radiation" and easily accessible area



during post-accident conditions. All calibration and reagent gas piping and manual shut-off valves are stainless steel and Seismic Class I.

The hydrogen analyzer panel also contains the necessary instrumentation and controls for local calibration of the instrument during routine non-accident periods. The following "local" alarms are provided at the hydrogen analyzer panels to indicate the status of various components:

1. Low Sample Flow to Hydrogen Analyzer
2. Low Calibration (Hydrogen) Gas Pressure
3. Low Reagent (Oxygen) Gas Pressure
4. Low Hydrogen Analyzer Compartment Temperature
5. Hydrogen Analyzer Cell Failure
6. High Hydrogen Concentration

Each of these alarms in turn annunciates a common Hydrogen Monitoring System Abnormal alarm in the unit control room and at the hydrogen analyzer remote control panel.

The remote control panels were designed to operate all the necessary post-accident hydrogen monitoring instrumentation and controls from a remote, "low-radiation" area. The location selected was the spray additive tank room (SATR) on Elevation 587' of the Auxiliary Building.

The SATR is located below the spent fuel pit providing excellent protection from radiation for personnel working within this room. Four panels, two per unit, are located in the SATR. Figure 2 details the arrangement of the Unit No. 1 and 2 remote control panels in the SATR.

The remote control panels are designed and installed in accordance with Seismic Class I criteria. The panels are 72" H x 30" W x 30" D rigidly constructed, enclosed cabinets with three penetrations at the top for electrical conduit. Each Remote Control Panel contains a dual range hydrogen concentration indicator -- 0 to 10 percent and 0 - 30 percent hydrogen (by volume), a recorder to provide a permanent record of the hydrogen concentration, and the necessary instrumentation and controls for "remote" calibration of the hydrogen analyzers from the SATR.

The remote control panels also contain the control switches for operating the containment hydrogen sample isolation valves and control switches for the solenoid-operated isolation valves on the sample inlet to and outlet lines from the hydrogen analyzer panels. The control panel also contains a containment isolation valve selector switching station. Selection of the containment isolation valves for



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a particular sample can be done manually or automatically via the use of the selector switching station. The selector switching station is an integral part of the hydrogen concentration recorder.

Hydrogen concentration indicators for each hydrogen analyzer-remote control panel train are provided on the "Isolation Valves" (IV) Panel in each unit's main control room. These indicators are dual range instruments having 0 to 10 percent and 0 to 30 percent hydrogen concentration scales, an accuracy of +2 percent of full scale, a repeatability of $+2\frac{1}{2}$ percent of full scale, and a maximum response of 2.5 seconds.



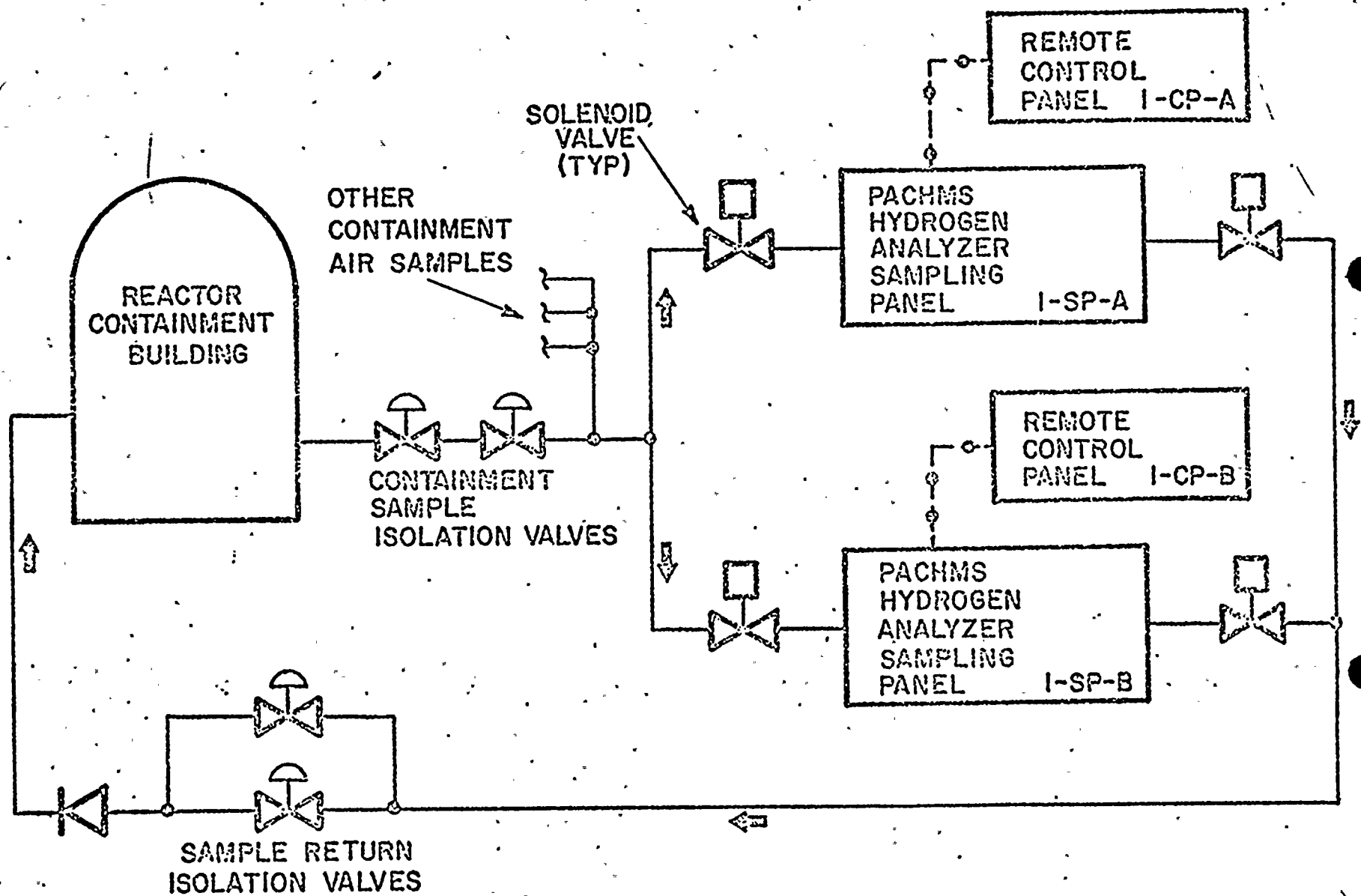
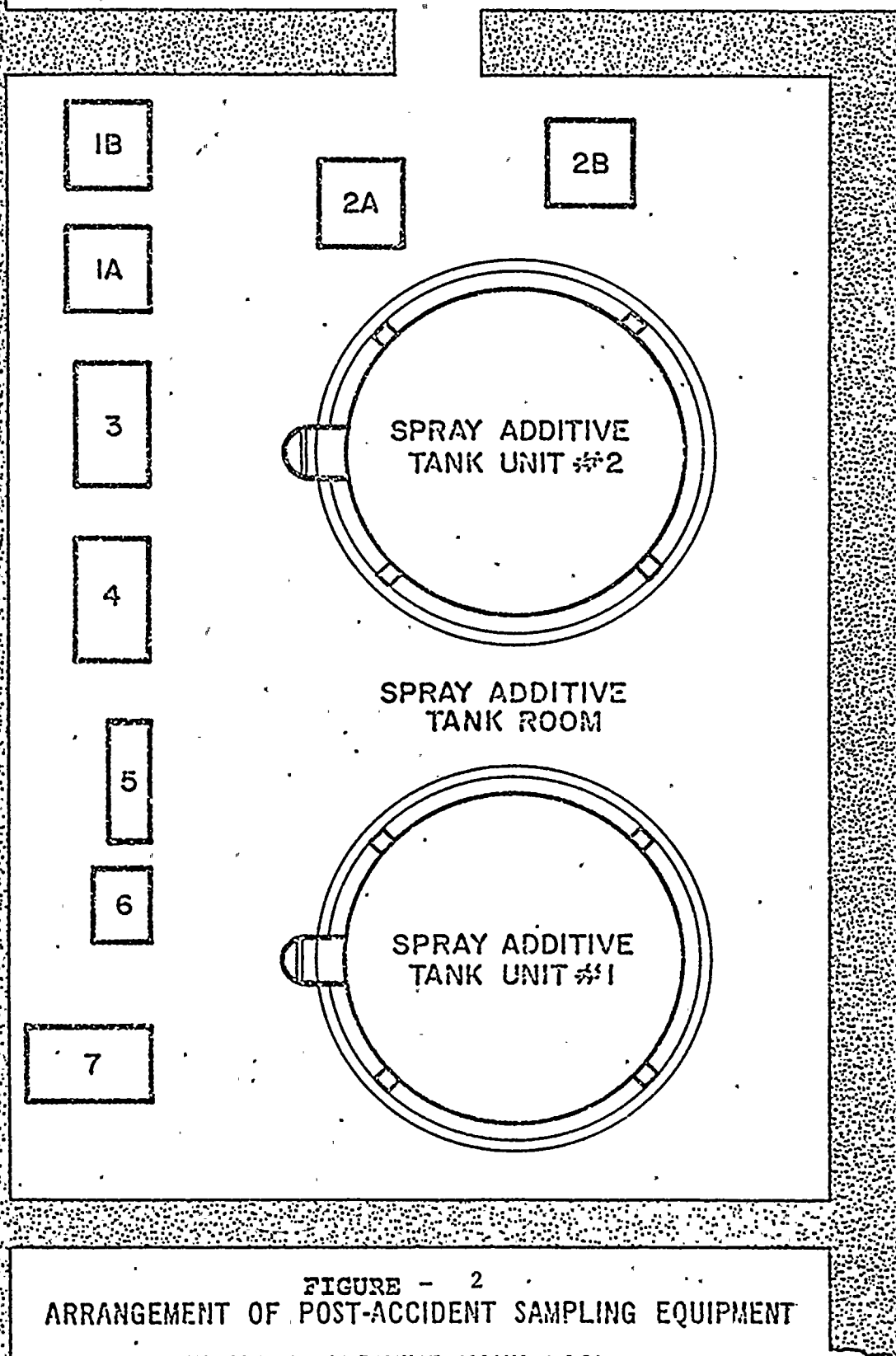


FIGURE - 1

SCHEMATIC DIAGRAM OF POST-ACCIDENT CONTAINMENT HYDROGEN MONITORING SYSTEM (PACHMS)

1A, 1B - PACHMS REMOTE CONTROL PANELS - UNIT NO. 1
2A, 2B - PACHMS REMOTE CONTROL PANELS - UNIT NO. 2
3 TO 7 - POST-ACCIDENT LIQUID & GAS SAMPLING EQUIPMENT



AUXILIARY BUILDING
ELEVATION-537

FIGURE - 2
ARRANGEMENT OF POST-ACCIDENT SAMPLING EQUIPMENT
IN SPRAY ADDITIVE TANK ROOM

