UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 3 1979

MEMORANDUM FOR: R. L. Tedesco, Assistant Director for Reactor Safety, DSS

FROM: W. R. Butler, Chief, Containment Systems Branch, DSS

SUBJECT: RESULTS OF SURVEY OF TYPICAL OL APPLICATIONS
RE: HYDROGEN INSTRUMENTATION

The purpose of this memorandum is to respond to your request concerning the status of H_2 instrumentation for typical OL applications under current review.

Specifically, the task was to determine for representative Babcock and Wilcox, Combustion Engineering, Westinghouse and General Electric power plants currently under OL review the following:

a. Is hydrogen concentration in the containment atmosphere measured?

b. If hydrogen concentration is measured, is it done continuously or by grab samples;

c. For continuous hydrogen measurement, are the instruments safety grade, and where is the readout panel located?

d. For grab sample measurement, is the system designed to accommodate the associated high radiation levels in the containment atmosphere in terms of personnel access to the sampling location?

The enclosed table titled "Hydrogen Instrumentation Survey for Typical Current OL Applications" provides the available answers to these questions. The table indicates that in all of the plants surveyed the hydrogen concentration is measured on a continuous basis, except in the case of McGuire where the hydrogen concentration is by grab samples. For continuous hydrogen measurement, the instrumentation is safety grade, except for the Waterford 3 plant which is nonsafety grade and remains an open issue in our licensing review.

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With regard to the high radiation protection for McGuire's grab sample system, the SAR does not specify any access protection for TID source release.

The Plant Systems Branch is conducting a similar survey for all operating plants; the results will be presented in a tabular format. This table will give a brief description of the hydrogen monitoring system, the associated technical specification, safety grade status and the types of recombiners and purge systems used. The results of this survey will be available in the near future.

It should be noted that our general survey taken for current OL applications is based on the limited and often vague information provided in the SARs. If more detailed information is required, a list of questions in the subject area will have to be prepared so that the information can be obtained from the applicants/licensees.

Walter R. Butler

Walter R. Butler, Chief
Containment Systems Branch
Division of Systems Safety

Enclosure:
As stated

cc: G. Lainas
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Hydrogen Instrumentation Survey for Typical Current OL Applications

Plant Considered	Type of Recombiner	Is H_2 Concentration Measured?	Continuous Or Grab Sample Measurement	For Cont. Measurement is Instru. Safety Grade? Location of Readout Panel	Is High Radiation Protection Provided for Grab Sample?
Byron/Braidwood - Westinghouse - (At Q-1 Stage)	AI External Recombiner	Yes (only when recombiner fans operating)	Continuous when recombiner operating	Safety grade, local readout at recombiner, main control room readout implied in SAR	N/A (Temporary shielding for access to recombiner is provided).
Watts Bar - Westinghouse - (At Q-2 Stage)	Westinghouse Internal Recombiner	Yes	Continuous	Safety grade, monitored and operated from main control room	N/A
McGuire - Westinghouse - (SER Issued)	Westinghouse Internal Recombiner	Yes	Grab Sample	N/A	For sample system the SAR does not specify TID source release protection. SAR states recombiner control panel in electrical penetration room in area accessible following LOCA.

Hydrogen Instrumentation Survey for Typical Current OL Applications

Plant Considered	Type of Recombiner	Is H_2 Concentration Measured?	Continuous Or Grab Sample Measurement	For Cont. Measurement is Instru. Safety Grade? Location of Readout Panel	Is High Radiation Protection Provided for Grab Sample?
Bellefonte - Babcock & Wilcox - (Delayed Review)	Westinghouse Internal Recombiner	Yes Within 24 hours of LOCA	Continuous	Safety Grade Recombiner control in main control room.	N/A
Midland - Babcock & Wilcox - (Draft SAR)	Westinghouse Internal Recombiner	Yes	Continuous	Safety grade, readout and alarms in main control room	N/A
San Onofre 2 & 3 - Combustion Engineering - (Draft SER)	Westinghouse Internal Recombiner	Yes	Continuous	Safety grade, remote readout alarms and controls in main control room	N/A

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Hydrogen Instrumentation Survey for Typical Current OL Applications

Plant Considered	Type of Recombiner	Is H_2 Concentration Measured?	Continuous Or Grab Sample Measurement	For Cont. Measurement is Instru. Safety Grade? Location of Readout Panel	Is High Radiation Protection Provided for Grab Sample?
Waterford-3 - Combustion Engineering -	Westinghouse Internal Recombiner	Yes	Continuous	Nonsafety grade (open issue) remote station in main control room. Main panel in auxiliary building	N/A
Shoreham - General Electric -	AI External Recombiner	Yes 2 locations in drywell 2 locations in wetwell	Continuous	Safety grade, readout in main control room	(Analyzed automatically without need of operator)
Zimmer - General Electric	GE External Recombiner	Yes 2 locations in drywell 2 locations in wetwell	Continuous Automatically taken on isolation signals	Safety grade, readout in control room	(Remotely taken without need of operator)