



Illinois Power Company  
Clinton Power Station  
P.O. Box 678  
Clinton, IL 61727  
Tel 217 935-8881  
U-602180  
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Docket No. 50-461

10CFR50.59

Document Control Desk  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Clinton Power Station Post Accident Sampling  
System Evaluation Report

Dear Sir:

The purpose of this letter is to provide a revision to the Clinton Power Station (CPS) Post Accident Sampling System (PASS) Evaluation Report (attached). This report was originally provided to NRC staff via Illinois Power Company (IP) letter U-0833, dated April 19, 1985, with a revision provided to the NRC by IP letter U-600525, dated May 5, 1986.

The purpose of this revision is to reflect changes regarding samples, and subsequent sample analyses, which are obtained via the CPS PASS panel. The purpose of the post accident sampling system is to provide a method to obtain samples which can be used to determine the extent of reactor core degradation following a severe reactor accident. Post accident sample analyses results are utilized by CPS Emergency Plan Implementing Procedure (EPIP) EC-13, "Reactor Core Damage Estimation," for core damage estimations. The NRC reviewed and indicated their acceptance of the of this procedure in CPS Safety Evaluation Report, Supplement 5, Section 9.3.5. Certain samples identified in NUREG-0737, TMI Action Plan, Item II.B.3, to be used for post accident core damage estimations are not utilized by CPS EPIP EC-13 for this purpose. Specifically, EC-13 does not use primary coolant total gas, dissolved hydrogen, dissolved oxygen, or conductivity values for core damage estimations.

The estimation of core damage at CPS is performed by comparing the measured concentrations of major fission products in either containment or drywell gas samples (analyzed for xenon-133 and krypton-85 concentrations) or reactor coolant water samples (analyzed for iodine-133 and cesium-137 concentrations), after appropriate normalization with reference plant data from a BWR-6/238 with a Mark III containment.

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The measured fission products are corrected for decay, and the concentrations are normalized to the reference plant data for comparison to graphs to indicate percent cladding failure, percent fuel overheating, or percent fuel meltdown. Other plant indicators such as drywell and containment radiation level, containment hydrogen and oxygen levels and reactor vessel water level are also measured. These indicators can provide information to confirm the initial core damage estimate which is based on radionuclide measurements as discussed above.

Reactor coolant total gas, hydrogen, and oxygen concentrations and reactor coolant conductivity are not utilized at CPS for core damage estimation purposes and have been deleted from the CPS Post Accident Sampling System Evaluation Report. Since post accident sampling is described in the CPS Updated Safety Analysis Report (USAR), 10CFR50.59 safety evaluations were performed to document that the deletion of the subject analyses does not constitute a change in the CPS Technical Specifications or an unreviewed safety question. These safety evaluations were added as attachments to the revised CPS Post Accident Sampling System Evaluation Report.

The revision made to the CPS Post Accident Sampling System Evaluation Report does not affect compliance with the intent of NUREG-0737, TMI Action Plan Item II.B.3, in that with this revision, the CPS post accident sampling system maintains a mechanism to obtain samples which are used to determine the extent of reactor core degradation following a severe reactor accident. The intent of this revision has been discussed with J. E. House, Region III, Division of Radiation Safety and Safeguards, Radiological Control Section inspector and is acknowledged in Inspection Report No. 50-461/93011(DRSS) dated July 8, 1993.

Please notify me at your earliest convenience if there are any questions on the enclosed information.

Sincerely yours,



Richard F. Phares  
Director-Licensing

Attachment

MAR/nls

cc: NRC Clinton Licensing Project Manager  
NRC Resident Office, V-690  
Regional Administrator, Region III, USNRC  
Illinois Department of Nuclear Safety

Revision to the PASS Evaluation Report  
Summary

CRITERION #1

Page 2, 3, (a) - Delete reference to drywell and containment equipment and floor drain sumps.

Page 3, (b) - Delete reference to reactor coolant dissolved gas sampling.

Page 4, (c) - Delete reference to conductivity, dissolved hydrogen and dissolved oxygen analyzers.

(d) - Delete RC offgas reference.

(e) - Delete heat tracing reference.

Page 5, (f) - Delete RC offgas, RC dissolved oxygen, and RC conductivity references.

(g) - Delete liquid dissolved hydrogen section.

Page 6, (h) - Delete dissolved oxygen and liquid conductivity references.

Impact on Compliance with Regulatory Requirements

- (a) None. NRC staff concluded in CPS Safety Evaluation Report, Supplement 7, Section 9.3.5, page 9-5, that CPS meets the requirements of item II.B.3 of NUREG 0737 without sump sampling capability.
- (b) None. Reactor coolant dissolved noble gas is not a requirement of NUREG 0737 or R/G 1.97 Rev. 3. Reactor coolant dissolved noble gas provides no useful information to CPS. CPS is retracting this PASS capability. (Reference 10CFR50.59 Safety Evaluation 93-0060). See Criterion 2(c) & 2(d) for other RC gases.
- (c) None. Reactor coolant conductivity is not a NUREG 0737 item II.B.3 requirement (reference 10CFR50.59 Safety Evaluation #93-0063). For RC dissolved hydrogen and oxygen see Criterion 2(c) & 2(d)
- (d) None. See Criterion 1(b).

- (e) None. Heat tracing supports representative containment and drywell atmospheric iodine samples. Containment/Drywell atmospheric samples are not analyzed for radioiodine. Containment/Drywell atmospheric radioiodine sampling and analysis is not required by NUREG 0737 item II.B.3. (Reference 10CFR50.59 Safety Evaluation #930059 attached).
- (f) None. See Criterion 1(b), 1(c), and 2(d).
- (g) None. See Criterion 2(c).
- (h) None. See Criterion 1(c) and 2(d).

#### CRITERION #2

Page 9, (a) - Separated the compound sentence to more clearly define which PASS samples are obtained by CPS (e.g. I-131 & Cs-137 for water samples and Xe-133 & Kr-85 in atmospheric samples).

Page 12, (b) - Delete reference to RC offgas sample.

(c) - Justified not performing RC dissolved hydrogen at PASS.

(d) - Justified not performing RC dissolved oxygen at PASS.

Page 13, (e) - Deleted references to RC dissolved hydrogen and oxygen.

#### Impact on Compliance with Regulatory Requirements

- (a) None. Previous wording grouped all analyses and referred to all sample locations. New wording clearing defines what and where CPS is sampling.
- (b) None. See Criterion 1(b).
- (c) None. CPS retracts from RC dissolved hydrogen sampling at PASS. RC dissolved hydrogen is not used for post accident core damage estimation (Reference 10CFR50.59 Safety Evaluation #93-0062 Attached). Since the intent of NUREG 0737 and Reg. Guide 1.97 is to provide useful data for post accident core damage estimations, and RC dissolved hydrogen is not used for this purpose at CPS, this exemption will have no impact.
- (d) None. RC dissolved oxygen at PASS is not mandatory per NUREG 0737. (Reference 10CFR50.59 Safety Evaluation #93-0061 Attached).
- (e) None. See Criterion 2(c) and 2(d).

CRITERION #3

Page 15 - Deleted valves which are not used by PASS from the valve list.

Impact on Compliance with Regulatory Requirements

None. These valves and their associated lines are no longer in use for PASS. See Criterion 1(a).

CRITERION #4

Page 16 - See 1(b), 2(c), and 2(d).

Impact on Compliance with Regulatory Requirements

See Criterion 1(b), 2(c), and 2(d).

CRITERION #5

No change.

CRITERION #6

Page 19 - Deleted reference to RC offgas.

Impact on Compliance with Regulatory Requirements

None. See Criterion 4, 1(b), 2(c), and 2(d).

CRITERION #7

No change.

CRITERION #8

Pages 23,24 (a) - Deleted RC dissolved hydrogen sampling.

(b) - Deleted RC dissolved oxygen sampling.

(c) - Deleted RC conductivity sampling at PASS.

(d) - Deleted Containment/Drywell atmospheric hydrogen/oxygen sampling at PASS.

Impact on Compliance with Regulatory Requirements

- (a) None. See criterion 2(c).
- (b) None. See criterion 2(d).
- (c) None. See Criterion 1(c).
- (d) None. CPS exceeds NUREG 0737 and Reg. Guide 1.97 sampling requirements. CPS maintains two independent, 1E powered, Tech. Spec. monitoring systems for containment and drywell atmospheric hydrogen and oxygen which require plant shutdown if either is inoperable. As CPS has a safety related backup, CPS meets the intent of NUREG 0737 and Reg. Guide 1.97. (Reference 10CFR50.59 Safety Evaluation #93-0058.)

CRITERION #9

No change.

CRITERION #10

Page 30 (a) - Deleted dissolved hydrogen in RC.

(b) - Deleted dissolved oxygen in RC.

Impact on Compliance with Regulatory Requirements

- (a) None. See criterion 2(c).
- (b) None. See criterion 2(d).

CRITERION #11

Pages 33, 34 - Deleted reference to containment and drywell atmospheric sample line heat tracing.

Impact on Compliance with Regulatory Requirements

None. See criterion 1(e).

ATTACHMENTS

(a) Table 1- Sampling and Analysis Times

This table has been revised to reflect only those analyses performed at CPS.

(b) Table 4- Predicted Activities of Grab Samples @ 1 HR after an Accident

Added clarifying note stating RC off-gas samples not obtained at CPS.

(c) Table 5 - Personnel Radiation Exposure Predictions

Revised to reflect CPS analyses. Deletes reference to RC off-gas. Updates total doses.

(d) Table 6 - Chemical Analysis Capability

Deleted samples which are not of use or not required including KC dissolved hydrogen, RC dissolved oxygen, RC conductivity.

(e) Attachment #1 - "Person - Motion Study"

Deleted RC off-gas and RC conductivity references.

Impact on Compliance with Regulatory Requirements

- (a) None. The total time is within the 3 hour limit. See Criterion 1(c), 2(c), and 2(d).
- (b) None. See Criterion 1(b), 2(c), and 2(d).
- (c) None. See Criterion 1(b), 2(c), and 2(d).
- (d) None. See Criterion 1(c), 2(c), and 2(d).
- (e) None. See Criterion 1(b), 1(c), 2(c), and 2(d).

In addition to the revision described above, editorial changes, which do not affect the technical content of the report, have been made throughout the text.