REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.:	**444-8530**
SRP Section:	**16 - Technical Specifications**
Application Section:	**16.3.7, 16.3.3.8, 16.3.3.9, 16.3.3.10**
Date of RAI Issue:	**03/16/2016**

Question No. 16-133

The applicant is requested to revise generic TS 3.3.8, "Containment Purge Isolation ActuationSignal (CPIAS)" and Bases as follows (See DCD Figure 7.3-10):

1. Change LCO statement to say, "One CPIAS **instrument division with two area radiation monitor** channels, **one Manual Actuation division, and one Actuation Logic division** shall be OPERABLE." This makes more sense because Fig. 7.3-77 shows Division A and Division B, each with two (gamma) radiation monitors. Also make conforming changes to the Bases for generic TS 3.3.8.

2. Move the Actions table Note to the Applicability, consistent with STS 3.3.8B. Also make conforming changes to the Bases for generic TS 3.3.8.

3. Revise the Applicability Note as indicated: "Only required when the **associated containment purge or exhaust line** penetration **flow path** is not isolated by at least one closed and deactivated automatic valve, closed manual valve, or blind flange." Also make conforming changes to the Bases for generic TS 3.3.8.

4. Revise Condition A as follows: "CPIAS **required** Manual Actuation **division**, **required** Actuation Logic **division**, or **required instrument division with** one or more required channels of **area** radiation monitors **channels** inoperable in MODES 1, 2, 3, and 4." Also make conforming changes to the Bases for generic TS 3.3.8.

5. Revise Required Action A.1 as follows: "Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," **for containment purge isolation valves** made inoperable by CPIAS instrumentation. Also make conforming changes to the Bases for generic TS 3.3.8.

6. Revise Condition C as follows: "CPIAS **required** Manual Actuation **division**, **required** Actuation Logic **division**, or **required instrument division with** one or more required

~~channels of~~ **area** radiation monitor~~s~~ **channels** inoperable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment." Also make conforming changes to the Bases for generic TS 3.3.8.

7. The Surveillance Requirements table for Specification 3.3.8 has sufficient room to begin on the fourth line below the end of the Actions table, instead of on the next page.

8. How does the 7 day Channel Check Frequency of STS 3.3.8B, SR 3.3.8.2 for CPIS particulate and iodine radiation monitor channels apply to the APR1400 containment operating area (gamma) radiation monitor channels? The generic TS SR 3.3.8.2 Channel Check Frequency should also be 12 hours, the same as the generic TS SR 3.3.8.1 Frequency of 12 hours for the containment upper operating area (gamma) radiation monitor channels. Also make conforming changes to the Bases for generic TS 3.3.8.

9. Revise surveillance column Note for SR 3.3.8.3 as indicated: ~~This SR is applicable~~ "**Only required to be met** in MODES 1, ~~2~~, 3, and 4 ~~only~~. Also make conforming changes to the Bases for generic TS 3.3.8.

10. Revise surveillance column Note for SR 3.3.8.4 as indicated: ~~This SR is applicable~~ "**Only required to be met** during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment." Also make conforming changes to the Bases for generic TS 3.3.8.

11. To be consistent with STS 3.3.8B, SR 3.3.8.3, Channel Functional Test, revise generic TS SR 3.3.8.4 by inserting "each" before "required" because SR 3.3.8.4 should address testing of "each required containment radiation monitor channel" as does SR 3.3.8.3. Also make conforming changes to the Bases for generic TS 3.3.8.

12. To be consistent with STS 3.3.8B, SR 3.3.8.5, Channel Functional Test on "required CPIS Actuation Logic channel," revise surveillance column Note for generic TS SR 3.3.8.5 as indicated: "Surveillance ~~Requirement~~ of Actuation Logic shall include actuation of each initiation circuit and verification of proper operation of each initiation circuit. In addition, the STS SR 3.3.8.5 Note says "Surveillance of Actuation Logic shall include the actuation of each initiation relay and verification of the proper operation of each initiation relay." Explain the difference between "initiation circuit" and "initiation relay."

13. To be consistent with suggested edits to LCO 3.3.8, and Conditions A and C, revise SR 3.3.8.5 as indicated: "Perform CHANNEL FUNCTIONAL TEST on required CPIAS Actuation Logic ~~channel~~ **division**." Also make conforming changes to the Bases for generic TS 3.3.8.

14. To be consistent with suggested edits to LCO 3.3.8, Conditions A and C, and SR 3.8.3.4, revise SR 3.3.8.6 as indicated: "Perform CHANNEL CALIBRATION on **each** required containment radiation monitor channel in accordance with Setpoint Control Program." Also make conforming changes to the Bases for generic TS 3.3.8.

15. To be consistent with suggested edits to SR 3.3.8.6, revise generic TS SR 3.3.8.7 as indicated: "Verify that the response time of **each** required CPIAS ~~channel~~ **division** is within limits." Also make conforming changes to the Bases for generic TS 3.3.8.

16. To be consistent with suggested edits to LCO 3.3.8, Conditions A and C, and SR 3.3.8.7, revise generic TS SR 3.3.8.8 as indicated: "Perform CHANNEL FUNCTIONAL TEST on required CPIAS Manual Actuation ~~channel~~ **division**." Also make conforming changes to the Bases for generic TS 3.3.8.

17. Applicant is requested to revise the Bases for Specification 3.3.8 as follows:

    a. B 3.3.8 Background section

       (1) The first paragraph is almost identical to the STS B 3.3.8B paragraph. Such material should be formatted as a Reviewer's Note because it describes CPIAS as a "plant specific instrumentation channel" and states, "Individual plants shall include the CPIAS Function and LCO requirements that are applicable to them." In a design certification application's generic TS, site- or plant-specific information is called combined license information, or a COL Action Item, which is denoted with square brackets enclosing the site-specific information. However, there is no site-specific information in the first paragraph. Staff request the applicant to consider revising the paragraph for clarity and consistency, as follows:

           This LCO encompasses the CPIAS, which is ~~a plant specific~~ **an Engineered Safety Feature (ESF)** instrumentation **and control system** ~~channel~~ that performs a~~n~~ **containment isolation** actuation function required for plant protection **against the uncontrolled release of radioactivity but** is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and **M**~~m~~anual **Trip** ~~actuation~~," or LCO 3.3.7, "Emergency Diesel Generator (EDG) – Loss of Voltage Start (LOVS)." ~~Individual plants shall include the CPIAS Function and LCO requirements that are applicable to them.~~

       (2) The second paragraph should be revised for consistency with the STS B 3.3.8B paragraph:

           The CPIAS provides protection from **the release of radioactivity and** radioactive contamination in the containment in the event a fuel assembly should be severely damaged during handling. It also closes the purge valves during plant operation in response to a reactor coolant system (RCS) leak.

       (3) The fourth paragraph should be revised (per the markup below) for consistency with DCD Figure 7.3-10, and to <u>append an explanation of the differences</u> in the range of radiation intensity between the upper operating area monitors (RE 233A, 234B) and the [lower] operating area monitors (RE-231A, 231B). DCD Table 7.3-5B indicates that the normal operation ranges for these monitors are 14 mSv/hr and 0.5 mSv/hr, respectively, with nominal actuation setpoints of 28 mSv/hr and 2.5 mSv/hr, respectively. This table also indicates that the

containment operating area radiation monitors are used for CPIAS actuation during fuel handling operations. DCD Table 12.3-6 states the ranges as "10^1 ~ 10^8 mSv/hr" and "10^{-3} ~ 10^2 mSv/hr," respectively.

The CPIAS includes two independent, redundant logic **divisions**~~subsystems~~, including actuation **logic** ~~trains~~. Each ~~train~~ **division** employs two sensors, each one detecting gamma (area).

DCD 12.3.4.1.5.a describes safety-related area monitors, and states:

"These monitors are accident monitoring instrumentation (AMI), type C, and also listed on Table 7.5-1."

"The containment upper operating area monitors (RE-233A, 234B) consist of physically independent and electrically separated detectors located inside the containment away from the influence of the reactor coolant system to measure high-range gamma radiation. This monitor gives operators a seismically and environmentally qualified indication of containment airborne activity."

(4) The fifth and sixth paragraphs should be revised as indicated for consistency:

If **the signal from** any one of these **four** sensors exceeds the bistable **logic** trip setpoint, ~~the~~ **both** CPIAS ~~train~~ **Division A and Division B** will be actuated (one-out-of-~~two~~ **four** logic).

Each ~~train~~ **CPIAS division** actuates a separate series valve in the containment **low and high volume** purge supply and return lines. Either ~~train~~ **CPIAS division** controls sufficient equipment to perform the isolation function. These valves are also isolated on a Safety Injection Actuation Signal (SIAS) and Containment Isolation Actuation Signal (CIAS).

(5) The seventh, eighth, and ninth paragraphs should be revised as indicated for consistency:

Nominal Trip~~Actuation~~ Setpoints and Allowable Values

~~Actuation~~ **The nominal trip** setpoints **(NTSPs)** used in the bistable~~s~~ **logic** are based on the **accident analyses'** analytical limits (Reference 1). The selection of ~~these actuation setpoints~~ **NTSPs** is such that adequate protection is provided when all sensor and processing time delays are taken into account.

To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, actuation setpoint Allowable Values specified in the setpoint control program (SCP) are conservatively ~~adjusted~~ **calculated** with respect to the analytical limits. The actual ~~nominal actuation setpoint~~ **NTSP** entered into the bistable **logic** is ~~normally still~~ more conservative than ~~that specified by~~ the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST.

One example of such a change in measurement error is drift **of the transmitter** during the surveillance interval. If the ~~measured~~ **as-found actuation** ~~setpoint~~ **setting measured by the CHANNEL FUNCTIONAL TEST remains conservative with respect to the As-Found Tolerance (AFT) band around the previous as-left setting between successive CHANNEL CALIBRATIONS and** does not exceed the Allowable Value, the ~~bistable~~ **instrument channel** is considered OPERABLE**, provided the channel is performing normally as expected**.

Setpoints in accordance with the ~~allowable value~~ **Allowable Value** will ensure that safety limits are not violated during anticipated operational occurrences (AOOs) and the consequences of design basis accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.

b.   B 3.3.8 Applicable Safety Analyses section

Revise the three paragraphs as shown in the following markup for clarity and consistency:

The CPIAS is a backup to the CIAS systems in MODES 1, 2, 3, and 4 and will close the containment **low and high volume** purge **supply and exhaust line isolation** valves in the event of high radiation levels resulting from a primary leak in the containment.

The CPIAS is also required to close the containment purge **line isolation** valves in the event of the fuel handling accident in containment, as described in Reference 1. This accident is a limiting case representing a class of accidents that may involve ~~radiation~~ **radioactivity** release in containment without CIAS actuation. The CPIAS ensures the consequences of a dropped **irradiated fuel** assembly in containment are not as severe as a dropped **irradiated fuel** assembly in the fuel handling area. This ensures that the offsite consequences of ~~radiation~~ **fuel handling** accidents in containment are within 10 CFR 50.34 limits (Reference 2).

The CPIAS satisfies the requirements of ~~LCO Selection~~ Criterion 3 **of 10 CFR 50.36(c)(2)(ii)**.

c.   B 3.3.8 LCO section

(1)   Revise the first five paragraphs as shown in the following markup for clarity and consistency:

LCO 3.3.8 requires one CPIAS ~~channel~~ **division** to be OPERABLE. The required ~~channel~~ **division** consists of **one instrument division with two** area radiation monitor~~s~~ **channels**, one ~~a~~**A**ctuation ~~l~~**L**ogic **division**; and **one** ~~m~~**M**anual ~~a~~**A**ctuation **division**.

The specific Allowable Values for the **actuation (trip)** setpoints of the CPIAS are listed in the ~~SRs~~ **Setpoint Control Program required documentation**.

Operation with a trip setpoint less conservative than the ~~nominal trip setpoint~~**NTSP**, but within its Allowable Value, is acceptable provided that the difference between the ~~nominal actuation~~ **actual trip setting** ~~setpoint~~ and the Allowable Value is equal to or greater than the drift allowance assumed for each actuation in the **calculated NTSP, which is derived from the analytical limit in the** transient and accident analyses.

Each **specified** Allowable Value ~~specified~~ is more conservative than the analytical limit assumed in the transient and accident analys~~i~~es in order to account for instrument uncertainties appropriate to the actuation function. **These uncertainties are defined in the NRC approved setpoint methodology specified by the Setpoint Control Program, Specification 5.5.19.**

The ~~bases~~ **Bases** for the LCO on CPIAS are discussed below for each

Function:

a. **Manual Actuation**~~manual actuation~~

The LCO on **the CPIAS Manual** **Actuation**~~manual actuation~~ **Function division** backs up the ~~automatic actuation~~ **CPIAS Automatic Actuation Function division** and ensures operators have the capability to rapidly initiate the CPIAS Function if any parameter is trending toward its **NTSP**~~setpoint~~. Only one **Manual Actuation**~~manual channel~~ **division** of CPIAS is required in MODES 1, 2, 3, and 4, since the CPIAS is redundant ~~with~~ **to** the CIAS and SIAS **for isolating the purge supply and exhaust line containment penetrations**. Only one **Manual Actuation**~~manual~~ **channel** **division** of CPIAS is required during CORE ALTERATIONS and movement of irradiated fuel assemblies, since there are additional means of closing the containment purge **isolation** valves in the event of a **Manual Actuation**~~manual~~ **channel** **division** failure.

b. C~~ontainment~~ Area Radiation **Monitors and Bistable Logic**

The LCO on the **CPIAS instrument Function division requires that** each **of the two area** radiation **monitor** channels ~~requires that each channel~~ be OPERABLE for ~~each actuation logic channel~~ **sending a bistable logic trip signal to the Actuation Logic division. The two area radiation monitor channels are not totally redundant to each other, since the indication overlap only ranges from 10 mSv/hour to 100 mSv/hour; however both NTSPs are within this range**.

The **CPIAS NTSP** ~~actuation setpoint~~ is selected to allow detection of small deviations from **the** normal **background radiation level**. The absolute value of the **NTSP** ~~actuation setpoint~~ in MODES 5 and 6 differs from the **NTSP** in MODES 1, 2, 3, and 4 so that a fuel handling accident can be detected in the **lower levels of** radiation ~~level~~ expected in ~~these~~ MODES **5 and 6**. **The containment upper operating area radiation monitor channel supports the CPIAS during MODES 1, 2, 3, and 4, and has a higher NTSP. The**

containment operating area radiation monitor channel supports the CPIAS during MODES 5 and 6, and has a lower NTSP. In any MODE, just one area radiation monitor channel is relied upon for initiating an automatic containment purge line isolation.

c.   **Actuation Logic** ~~actuation logic~~

One ~~channel of actuation logic~~ **Actuation Logic division** is required, since the **containment purge isolation** valves can be shut independently of the CPIAS signal either manually from the MCR or using either the SIAS or CIAS push button.

d.   B 3.3.8 Applicability section

Revise the three paragraphs as shown in the following markup for clarity and consistency:

In MODES 1, 2, 3, and 4, the low volume purge **line isolation valves** ~~values~~ may be open. In ~~the~~ **these** MODES, it is necessary to ensure the valves will shut in the event of a primary **coolant** leak in containment whenever any of the containment purge valves are open.

With the purge **line isolation** valves open during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, there is the possibility of a fuel handling accident requiring CPIAS on high radiation in containment.

The APPLICABILITY is modified by a Note, which states that the CPIAS Specification is only required when ~~the~~ **a purge line containment** penetration is not isolated by at least one closed and deactivated automatic valve, closed manual valve, or blind flange.

e.   B 3.3.8 Actions section

(1)   First, second, and third paragraphs should be revised as indicated for consistency: A CPIAS ~~channel~~ **division** is inoperable when it does not satisfy the OPERABILITY criteria for the ~~channel's~~ **division's** function. The most common cause of a **process instrument** channel inoperability is outright failure or drift of the ~~bistable or process module~~ **sensor, transmitter, or analog signal processing equipment** sufficient to exceed the tolerance allowed by the ~~plant specific~~ **NRC-approved setpoint methodology specified in the Setpoint Control Program, Specification 5.5.19**~~analysis~~. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the **as-found** actuation ~~setpoint~~ **setting** is not consistent with the Allowable Value, the ~~channel~~ **division** must be declared inoperable immediately, and the appropriate Conditions must be entered.

In the event a ~~channel's~~ **division's** actuation ~~setpoint~~ **setting** is found nonconservative with respect to the Allowable Value, or the sensor, instrument loop, signal processing electronics, or bistable **logic processor** is found inoperable, then all affected Functions provided by that ~~channel~~ **division** are required to be declared inoperable and the LCO Condition entered for the particular protective function affected.

When the number of inoperable channels **or divisions of** ~~in a~~ **an ESF** actuation Function exceeds that specified in any related Condition associated with the same **ESF** actuation Function, then the ~~plant~~ **unit** is outside the safety analysi~~e~~s. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

(2) The fourth and sixth paragraphs should be revised as indicated for consistency: <u>A.1</u>

Condition A applies to the failure of the CPIAS **required Manual Actuation division**~~manual actuation~~, **required Actuation Logic division,** ~~actuation logic,~~ and **one or more of the** required **CPIAS instrument division** area radiation monitor~~s~~ **channels in MODES 1, 2, 3, and 4**. The Required Action is to **immediately** enter the applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves." The Completion Time accounts for the condition that the capability to isolate containment on valid containment high radiation or manual signals is degraded during power operation**, startup, standby,** or **hot** shutdown MODES.

<u>C.1, C.2.1, C.2.2</u>

Condition C applies to the same conditions as are described in Condition A**,**~~;~~ ~~however, the applicability is~~ **but** during CORE ALTERATIONS or during the movement of irradiated fuel assemblies within containment. Required Action C.1 is to place the containment purge and exhaust isolation valves in the closed position. The Required Action immediately performs the isolation function of the CPIAS. Required Actions C.2.1 and C.2.2 may be performed in lieu of Required Action C.1. Required Action C.2.1 requires the suspension of CORE ALTERATIONS and Required Action C.2.2 requires suspension of movement of irradiated fuel in containment immediately. The Completion Time accounts for the fact that the automatic capability to isolate containment on valid containment high radiation signals is degraded during conditions in which a fuel handling accident is possible and CPIAS provides the only automatic mitigation of radiation release.

f.   B 3.3.8 Surveillance Requirements section

(1) The second, third, and fourth sentences of the Bases for SR 3.3.8.2 (Channel Check for Division A containment operating area radiation monitor channel, and Division B containment operating area radiation monitor channel) do not appear to be applicable to the gamma detectors of the containment operating area radiation monitor channels. And so, there appears to be no need for a

separate 7 day Channel Check for these channels. That is, SR 3.3.8.1 may be appropriate for these monitors in addition to the containment upper operating area radiation monitor channels, and SR 3.3.8.2 may be removed.

(2) The applicant is requested to revise the Bases for SR 3.3.8.1 (Channel Check for

- Division A containment upper operating area radiation monitor channel,

- Division B containment upper operating area radiation monitor channel,

- Division A containment operating area radiation monitor channel, and

- Division B containment operating area radiation monitor channel).
    The Bases should explain that

- Both containment upper operating area radiation monitor channels need to be operable so comparison of their indication can be made; and

- Both containment operating area radiation monitor channels need to be operable so comparison of their indication can be made.

(3) The applicant is requested to clarify the Bases for SR 3.3.8.3 and SR 3.3.8.4 regarding whether each applies to both the required upper operating area radiation monitor channel and the required operating area radiation monitor channel, or to just one of these monitors, respectively.

In addition, the first paragraph, last sentence of the Bases for SR 3.3.8.3 and SR 3.3.8.4 regarding the justification for the 92 day Frequency of the Channel Functional Test for the required area radiation monitor channels, may need revising if each of these SRs applies to just one of these monitors, respectively.

(4) The last sentence of the Bases for SR 3.3.8.3 and the last sentence of the Bases for SR 3.3.8.4, regarding the surveillance column Note, should be revised to be consistent with the requested changes to these Notes in Sub-questions 9 and 10 above.

(5) The Bases for SR 3.3.8.5 needs to be revised to reflect the design of the CPIAS division, as indicated:

SR 3.3.8.5

Proper operation of the individual initiation ~~relays~~ **circuits** is verified by actuating these ~~relays~~ **circuits** during the CHANNEL FUNCTIONAL TEST of the ~~actuation logic~~ **required Actuation Logic division** every

18 months. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each ~~train~~ **division** is thus verified. The Frequency of 18 months is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure

of ~~more than one channel~~ **an Actuation Logic division** of a given Function during any ~~18-month~~ **18 month** interval is a rare event. A Note to the SR indicates that this Surveillance includes verification of operation for each initiation ~~relay~~ **circuit**.

(6)   The Bases for SR 3.3.8.6 needs to be revised to correct errors and be more consistent with the STS SR 3.3.8.6 Bases, as indicated:

SR 3.3.8.6

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains ~~operational~~ **OPERABLE** between successive surveillances. **The SCP has controls which require verification that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the NRC-approved setpoint methodology.**

The ~~18-month~~ **18 month** Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage ~~and the potential for an unplanned transient if the Surveillance were performed with the reactor at power~~.

(7)   Revise the first sentence of the Bases for SR 3.3.8.7, for consistency, as indicated:

This Surveillance ensures that the ~~train~~ **CPIAS division** actuation response times are less than or equal to the maximum times assumed in the **accident** analyses **(Reference 1)**.

(8)   Revise the Bases for SR 3.3.8.8, for consistency, as indicated; revise the second paragraph so it is consistent with the CPIAS Manual Actuation division design; insert a justification for the Frequency:

SR 3.3.8.8

Every 18 months, a CHANNEL FUNCTIONAL TEST is performed on the **required** CPIAS **Manual Actuation division** ~~manual actuation channel~~.

This test verifies that the actuation push buttons are capable of ~~opening contacts in the actuation logic as designed, de-energizing the initiation relays and~~ providing manual actuation of the **containment purge line isolation** Function.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every 18 months.

g. B 3.3.8 References section

Replace "DCD Tier 2" with "FSAR" in Reference 1, and append ", Transient and Accident Analyses."

Response – (Rev. 1)

APR1400 Technical Specifications section 3.3.8 and Bases section 3.3.8 will be revised.

In the question 16-133 (12) and 16-133 (17.f (5)), initiation circuits are included in the engineered safety features – component control system (ESF-CCS) group controller (GC). The signals from initiation circuits are transferred to ESF-CCS loop controller (LC) via serial data link (SDL). These initiation circuits are not analog relays but digital circuits. The initiation circuit in SR 3.3.8.5 is correct. Also, the "initiation relay" in BASES 3.3.8, SR3.3.8.5 is revised to "initiation circuit".

In the question 16-133 (17.f (3)), the reason why both kinds of monitors (both ranges of detection) are needed is inserted in "BACKGROUND" of BASES 3.3.8.

The reason why the upper operating and operating radiation monitors are adequate in MODES 1, 2, 3, and 4, and during CORE ALTERATION, and during irradiated fuel assembly movement in containment is described in "APPLICABILITY" of BASES 3.3.8 as follows and there is no need to change BASES:

In MODES 1, 2, 3, and 4, the low volume purge line isolation valves may be open. In these MODES, it is necessary to ensure the valves will shut in the event of a primary coolant leak in containment whenever any of the containment purge valves are open.

With the purge line isolation valves open during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, there is the possibility of a fuel handling accident requiring CPIAS on high radiation in containment.

Impact on DCD

Same as changes described in Impact on Technical Specification section.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

APR1400 Technical Specifications section 3.3.8 and Bases section 3.3.8 will be revised, as indicated in the attachment associated with this response.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

3.3   INSTRUMENTATION

3.3.8   Containment Purge Isolation Actuation Signal (CPIAS)

One CPIAS instrument division with two area radiation monitor channels, one Manual Actuation division, and one Actuation Logic division

LCO   3.3.8   ~~One CPIAS channel~~ shall be OPERABLE.

associated containment purge or exhaust line penetration flow path

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

Move the "NOTE" to this position.

ACTIONS

Move

-- NOTE ---
Only required when the ~~penetration~~ is not isolated by at least one closed and deactivated automatic valve, closed manual valve, or blind flange.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~CPIAS Manual Actuation, Actuation Logic, or one or more required channels of radiation monitors inoperable in MODES 1, 2, 3, and 4.~~	A.1 ~~Enter applicable Conditions and Required Actions for affected valves of LCO 3.6.3, "Containment Isolation Valves," made inoperable by CPIAS instrumentation.~~	Immediately
B. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3.

AND

B.2 Be in MODE 5. | 6 hours

36 hours |

CPIAS required Manual Actuation division, required Actuation Logic division, or required instrument division with one or more required area radiation monitor channels inoperable in MODES 1, 2, 3, and 4.

Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge isolation valves made inoperable by CPIAS instrumentation.

Rev. 0

ACTIONS   (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. CPIAS ~~Manual Actuation, Actuation Logic, or one or more required channels of radiation monitors~~ inoperable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment.	C.1 Place and maintain containment purge and exhaust valves in closed position. OR C.2.1 Suspend CORE ALTERATIONS. AND C.2.2 Suspend movement of irradiated fuel assemblies in containment.	Immediately Immediately Immediately

required Manual Actuation division, required Actuation Logic division, or required instrument division with one or more required area radiation monitor channels

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RAI 444-8530 - Question 16-133
Attachment (3/14)

CPIAS
3.3.8

[Move to previous page]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.8.1 Perform CHANNEL CHECK on required containment upper operating area radiation monitor channel. [and operating area radiation monitor channel]	12 hours
~~SR 3.3.8.2~~ [SR 3.3.8.2] Perform ~~CHANNEL CHECK on required containment operating area radiation monitor channel.~~ [This SR is not applicable]	~~7 days~~ [N/A]
~~SR 3.3.8.3~~ [SR 3.3.8.2] [Only required to be met] ------------------------ NOTE ------------------------ ~~This SR is applicable~~ in MODES 1, 2, 3, and ~~4 only.~~ -- Perform CHANNEL FUNCTIONAL TEST on ~~each~~ [each required upper operating area radiation monitor channel and required operating area radiation monitor channel] ~~required containment radiation monitor channel~~ in accordance with Setpoint Control Program.	92 days
~~SR 3.3.8.4~~ [SR 3.3.8.3] [Only required to be met] ------------------------ NOTE ------------------------ ~~This SR is only applicable~~ during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. -- Perform CHANNEL FUNCTIONAL TEST on ~~required~~ [each required upper operating area radiation monitor channel and required operating area radiation monitor channel] ~~containment radiation monitor channel~~ in accordance with Setpoint Control Program.	92 days
~~SR 3.3.8.5~~ [SR 3.3.8.4] ------------------------ NOTE ------------------------ Surveillance ~~Requirement~~ of Actuation Logic shall include actuation of each initiation ~~circuit~~ [circuit] and verification of proper operation of each initiation ~~circuit~~ [relay] -- Perform CHANNEL FUNCTIONAL TEST on required CPIAS Actuation Logic ~~channel.~~ [division]	18 months

SURVEILLANCE REQUIREMENTS   (continued)

SURVEILLANCE	FREQUENCY
SR~~ 3.3.8.6~~ SR 3.3.8.5 Perform CHANNEL CALIBRATION on required containment radiation monitor channel in accordance with Setpoint Control Program. _(each)_	18 months
SR~~ 3.3.8.7~~ SR 3.3.8.6 Verify that the response time of required CPIAS ~~channel~~ is within limits. _(each)_ _(division)_	18 months
SR~~ 3.3.8.8~~ SR 3.3.8.7 Perform CHANNEL FUNCTIONAL TEST on required CPIAS Manual Actuation ~~channel~~. _(division)_	18 months

3.3.8-4

B 3.3   INSTRUMENTATION

B 3.3.8   Containment Purge Isolation Actuation Signal (CPIAS)

BASES

BACKGROUND

[Margin insert replacing struck text:] This LCO encompasses the CPIAS, which is an Engineered Safety Feature (ESF) instrumentation and control system that performs a containment isolation actuation function required for plant protection against the uncontrolled release of radioactivity but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.7, "Emergency Diesel Generator (EDG) - Loss of Voltage Start (LOVS)."

~~This LCO encompasses the CPIAS, which is a plant specific instrumentation channel that performs an actuation function required for plant protection but is not otherwise included in LCO 3.3.6, "Engineered Safety Features Actuation System (ESFAS) Logic and manual actuation," or LCO 3.3.7, "Emergency Diesel Generator (EDG) – Loss of Voltage Start (LOVS)." Individual plants shall include the CPIAS Function and LCO requirements that are applicable to them.~~

The CPIAS provides protection from [insert: the release of radioactivity and] radioactive contamination in the containment in the event a fuel assembly should be severely damaged during handling. It also closes the purge valves during plant operation in response to a reactor coolant system (RCS) leak.

The CPIAS will detect any abnormal amounts of radioactive material in the containment and will initiate purge valve closure to limit the release of radioactivity to the environment. Both the low and high volume purge supply and exhaust valves are closed on a CPIAS when a high radiation level in containment is detected.

The CPIAS includes two independent, redundant logic ~~subsystems~~ [divisions], including actuation ~~trains~~ [divisions]. Each ~~train~~ [logic] employs two sensors, each one detecting gamma (area).

[Insert "C" on the next page.]

~~If any one of these sensors exceeds the bistable trip setpoint, the CPIAS train will be actuated (one-out-of-two logic).~~

[Margin insert:] If the signal from any one of these four sensors exceeds the bistable logic trip setpoint, both CPIAS Division A and Division B will be actuated (one-out-of-four logic).

Each ~~train~~ [CPIAS division] actuates a separate series valve in the containment purge supply and return lines [insert: low and high volume]. Either ~~train~~ [CPIAS division] controls sufficient equipment to perform the isolation function. These valves are also isolated on a Safety Injection Actuation Signal (SIAS) and Containment Isolation Actuation Signal (CIAS).

~~Actuation~~ [Nominal Trip] Setpoints and Allowable Values

~~Actuation setpoints~~ [NTSPs] used in the bistables are based on the analytical limits (Reference 1). The selection of ~~these actuation setpoints~~ [NTSPs] is such that adequate protection is provided when all sensor and processing time delays are taken into account.

[Margin insert:] The nominal trip setpoints (NTSPs) used in the bistable logic are based on the accident analyses' analytical limits (Reference 1). [(Ref. 1)]

"C"

The upper operating area radiation sensors monitor loss of coolant accident (LOCA). A breach of reactor coolant pressure boundary is detected by this sensor. The measurement range reflects the purpose and intended function and is from 10^1 to 10^8 mSv/hr.

The operating area radiation sensors monitor the refueling operation to detect a fuel handling accident condition. These sensors generate a containment purge isolation actuation signal (CPIAS) should a fuel handling accident occur. The measurement range reflects the purpose and intended function and is from 10^{-3} to 10^2 mSv/hr.

The operating area radiation monitors are provided to input signals for a one-out-of-two coincident logic. Even though not required, the two upper operating area monitors can be used in a redundant capacity to the operating area radiation monitors. Therefore, the signals from the upper operating area radiation monitors are inputted into the CPIAS coincidence logic to take advantage of this capability and the one-out-of-two coincident logic is taken twice to ensure required safety function.

BASES

BACKGROUND   (continued)

[The actual NTSP entered into the bistable logic is more conservative than the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST.]

[calculated]

To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, actuation setpoint Allowable Values specified in the setpoint control program (SCP) are conservatively ~~adjusted~~ calculated with respect to the analytical limits. ~~The actual nominal actuation setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST.~~

~~One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.~~

[One example of such a change in measurement error is drift of the transmitter during the surveillance interval. If the as-found actuation setting measured by the CHANNEL FUNCTIONAL TEST remains conservative with respect to the As-Found Tolerance (AFT) band around the previous as-left setting between successive CHANNEL CALIBRATIONS and does not exceed the Allowable Value, the instrument channel is considered OPERABLE, provided the channel is performing normally as expected.]

[Allowable Value]

Setpoints in accordance with the ~~allowable value~~ Allowable Value will ensure that safety limits are not violated during anticipated operational occurrences (AOOs) and the consequences of design basis accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.

[low and high volume purge supply and exhaust line isolation]

SAFETY
ANALYSES

The CPIAS is a backup to the CIAS systems in MODES 1, 2, 3, and 4 and will close the containment ~~purge~~ valves in the event of high radiation levels resulting from a primary leak in the containment.

[radioactivity]   [line isolation]

The CPIAS is also required to close the containment purge valves in the event of the fuel handling accident in containment, as described in Reference 1. This accident is a limiting case representing a class of accidents that may involve ~~radiation~~ release in containment without CIAS actuation. The CPIAS ensures the consequences of a dropped fuel assembly in containment are not as severe as a dropped assembly in the fuel handling area. This ensures that the offsite consequences of ~~radiation~~ accidents in containment are within 10 CFR 50.34 limits (~~Reference 2~~).

[irradiated]   [irradiated fuel]   [fuel handling]   [(Ref. 2)]

The CPIAS satisfies the requirements of ~~LCO Selection~~ Criterion 3.

[of 10 CFR 50.36(c)(2)(II)]

BASES

LCO

LCO 3.3.8 requires one CPIAS division to be OPERABLE. The required division consists of one instrument division with two area radiation monitor channels, one Actuation Logic division; and one Manual Actuation division.

~~LCO 3.3.8 requires one CPIAS channel to be OPERABLE. The required channel consists of area radiation monitors, actuation logic; and manual actuation.~~

The specific Allowable Values for the setpoints [actuation (trip)] of the CPIAS are listed in the ~~SRs.~~ [Setpoint Control Program required documentation.]

Operation with a trip setpoint less conservative than the ~~nominal trip setpoint~~ [NTSP], but within its Allowable Value, is acceptable provided that the difference between the ~~nominal actuation setpoint~~ [actual trip setting] and the Allowable Value is equal to or greater than the drift allowance assumed for each actuation in the transient and accident analyses.

Each Allowable Value ~~specified~~ [specified] [calculated NTSP, which is derived from the analytical limit in the] is more conservative than the analytical limit assumed in the transient and accident ~~analysis~~ [analyses] in order to account for instrument uncertainties appropriate to the actuation function.

These uncertainties are defined in the NRC approved setpoint methodology specified by the Setpoint Control Program, Specification 5.5.19.

The ~~bases~~ [Bases] for the LCO on CPIAS are discussed below for each Function:

a.   ~~manual actuation~~ [Manual Actuation]

[Replace with "A" on the next page.]

~~The LCO on manual actuation backs up the automatic actuation and ensures operators have the capability to rapidly initiate the CPIAS Function if any parameter is trending toward its setpoint. Only one manual channel of CPIAS is required in MODES 1, 2, 3, and 4, since the CPIAS is redundant with the CIAS and SIAS. Only one manual channel of CPIAS is required during CORE ALTERATIONS and movement of irradiated fuel assemblies, since there are additional means of closing the containment purge valves in the event of a channel failure.~~

[Containment Area Radiation Monitors and Bistable Logic]

b.   ~~Containment Area Radiation~~

[Replace with "B" on the next page.]

~~The LCO on the radiation channels requires that each channel be OPERABLE for each actuation logic channel.~~

~~The actuation setpoint is selected to allow detection of small deviations from normal. The absolute value of the actuation setpoint in MODES 5 and 6 differs from the setpoint in MODES 1, 2, 3, and 4 so that a fuel handling accident can be detected in the radiation level expected in these MODES.~~

"A"

Insert "."

The LCO on the CPIAS Manual Actuation Function division backs up the CPIAS Automatic Actuation Function division and ensures operators have the capability to rapidly initiate the CPIAS Function if any parameter is trending toward its NTSP. Only one Manual Actuation division of CPIAS is required in MODES 1, 2, 3, and 4, since the CPIAS is redundant to the CIAS and SIAS for isolating the purge supply and exhaust line containment penetrations. Only one Manual Actuation division of CPIAS is required during CORE ALTERATIONS and movement of irradiated fuel assemblies, since there are additional means of closing the containment purge isolation valves in the event of a Manual Actuation division failure.

"B"

The LCO on the CPIAS instrument Function division requires that each of the two area radiation monitor channels be OPERABLE for sending a bistable logic trip signal to the Actuation Logic division. The two area radiation monitor channels are not totally redundant to each other, since the indication overlap only ranges from 10 mSv/hour to 100 mSv/hour; however both NTSPs are within this range.

The CPIAS NTSP is selected to allow detection of small deviations from the normal background radiation level. The absolute value of the NTSP in MODES 5 and 6 differs from the NTSP in MODES 1, 2, 3, and 4 so that a fuel handling accident can be detected in the lower levels of radiation expected in MODES 5 and 6. The containment upper operating area radiation monitor channel supports the CPIAS during MODES 1, 2, 3, and 4, and has a higher NTSP. The containment operating area radiation monitor channel supports the CPIAS during MODES 5 and 6, and has a lower NTSP. In any MODE, just one area radiation monitor channel is relied upon for initiating an automatic containment purge line isolation.

BASES

LCO   (continued)

[Actuation Logic]

c. ~~actuation logic~~

[Actuation Logic division]

One ~~channel of actuation logic~~ is required, since the valves can be shut independently of the CPIAS signal either manually from the MCR or using either the SIAS or CIAS push button.

[containment purge isolation]

[line isolation valves]

APPLICABILITY   In MODES 1, 2, 3, and 4, the low volume purge ~~valves~~ may be open. [these] In ~~the~~ MODES, it is necessary to ensure the valves will shut in the event of a primary leak in containment whenever any of the containment purge valves are open. [coolant]

[line isolation]

[associated containment purge or exhaust line]

With the purge valves open during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, there is the possibility of a fuel handling accident requiring CPIAS on high radiation in containment.

[flow path]

The APPLICABILITY is modified by a Note, which states that the CPIAS Specification is only required when the penetration is not isolated by at least one closed and deactivated automatic valve, closed manual valve, or blind flange.

[process instrument]   [division]   [division's]

[sensor, transmitter, or analog signal processing equipment]

ACTIONS   A CPIAS ~~channel~~ is inoperable when it does not satisfy the OPERABILITY criteria for the ~~channel's~~ function.   The most common cause of channel inoperability is outright failure or drift of the ~~bistable or process module~~ sufficient to exceed the tolerance allowed by the ~~plant specific setpoint analysis~~.   Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function.   This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification.   If the actuation ~~setpoint~~ is not consistent with the Allowable Value, the ~~channel~~ must be declared inoperable immediately, and the appropriate Conditions must be entered.

[as-found]

[division]

[NRC-approved setpoint methodology specified in the Setpoint Control Program, Specification 5.5.19]

[division's]   [setting]

In the event a ~~channel's~~ actuation ~~setpoint~~ is found nonconservative with respect to the Allowable Value, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that ~~channel~~ are required to be declared inoperable and the LCO Condition entered for the particular protective function affected.

[division]   [logic processor]

BASES

ACTIONS   (continued)

[red annotation: or divisions of an ESF]

When the number of inoperable channels ~~in a~~ actuation Function exceeds that specified in any related Condition associated with the same actuation Function, then the ~~plant~~ is outside the safety ~~analysis~~.   Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

[red annotations: unit; analyses; ESF; immediately]

A.1

~~Condition A applies to the failure of CPIAS manual actuation, actuation logic, and required area radiation monitors.~~   The Required Action is to enter the applicable Conditions and Required Actions ~~for affected valves~~ of LCO 3.6.3, "Containment Isolation Valves~~."~~   The Completion Time accounts for the condition that the capability to isolate containment on valid containment high radiation or manual signals is degraded during power operation ~~or~~ shutdown MODES.

[red annotation replacing struck text: Condition A applies to the failure of the CPIAS required Manual Actuation division, required Actuation Logic division, and one or more of the required CPIAS instrument division area radiation monitor channels in MODES 1, 2, 3, and 4.]

[red annotations: , startup, standby, or hot; ," for containment purge isolation valves made in operable by CPIAS instrumentation.]

B.1 and B.2

Condition B applies when the Required Action and associated Completion Time of Condition A are not met in MODE 1, 2, 3, or 4.   If Required Action A cannot be met within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply.   To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and MODE 5 within 36 hours.

C.1, C.2.1, and C.2.2

[red annotation: , but]

Condition C applies to the same conditions as are described in Condition A~~; however, the applicability is~~ during CORE ALTERATIONS or during the movement of irradiated fuel assemblies within containment. Required Action C.1 is to place the containment purge and exhaust isolation valves in the closed position.   The Required Action immediately performs the isolation function of the CPIAS.   Required Actions C.2.1 and C.2.2 may be performed in lieu of Required Action C.1.   Required Action C.2.1 requires the suspension of CORE ALTERATIONS and Required Action C.2.2 requires suspension of movement of irradiated fuel in containment immediately.   The Completion Time accounts for the fact that the automatic capability to isolate containment on valid containment high radiation signals is degraded during conditions in which a fuel handling accident is possible and CPIAS provides the only automatic mitigation of radiation release.

CPIAS
B 3.3.8

BASES

SURVEILLANCE   SR   3.3.8.1 | and operating area radiation monitor channels |
REQUIREMENTS

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred on the required upper operating area radiation monitor channels used in the CPIAS.   A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels.

| Both containment upper operating area radiation monitor channels and both containment operating area radiation monitor channels need to be OPERABLE so comparison can be made. |

It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.   Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious.   CHANNEL CHECK will detect gross channel failure. Thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability.   If a channel is outside the criteria, it could be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Surveillance Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12-hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.   The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

~~SR   3.3.8.2~~

~~SR 3.3.8.2 is the performance of a CHANNEL CHECK on the operating area monitor channels used in the CPIAS.   It differs only in the Frequency as weekly.   This technique results in an integration of total operating area radiation activity until the assemblies are replaced.   The low levels of activity expected make more frequent monitoring unnecessary.~~

| ~~SR 3.3.8.2 is the performance of a CHANNEL CHECK on the particulate and iodine channels.   SR 3.3.8.2 is not applicable because there is no particulate and iodine channels in CPIAS.~~ |

BASES

SURVEILLANCE REQUIREMENTS   (continued)

[SR 3.3.8.2] ~~SR 3.3.8.3~~

[annotation: each required upper operating area radiation monitor channel and required operating area radiation monitor channel]
[annotation: each]

A CHANNEL FUNCTIONAL TEST is performed on ~~the required containment radiation monitoring channel~~ to ensure the entire channel will perform its intended function.   The SCP has controls which require verification that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.   The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92-day Frequency is a rare event.

[annotation: each] [annotation: required to be met]

A Note to the SR indicates this Surveillance is ~~applicable~~ in MODES 1, 2, 3, and 4 only.

[annotation: each required upper operating area radiation monitor channel and required operating area radiation monitor channel]

[SR 3.3.8.3] ~~SR 3.3.8.4~~

A CHANNEL FUNCTIONAL TEST is performed on ~~the required containment radiation monitoring channel~~ to ensure the entire channel will perform its intended function.   The SCP has controls which require verification that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.   The Frequency of 92 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 92-day interval is a rare event.

[annotation: required to be met]

A Note to the SR indicates that this test is only ~~applicable~~ during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.

[SR 3.3.8.4] ~~SR 3.3.8.5~~

[annotation: circuit] [annotation: required Actuation Logic division] [annotation: circuits]

Proper operation of the individual initiation ~~relays~~ is verified by actuating these ~~relays~~ during the CHANNEL FUNCTIONAL TEST of the ~~actuation logic~~ every 18 months.   This will actuate the Function, operating all associated equipment.   Proper operation of the equipment actuated by each ~~train~~ is thus verified.   The Frequency of 18 months is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of ~~more than one channel~~ of a given Function during any ~~18-month~~ interval is a rare event.   A Note to the SR indicates that this Surveillance includes verification of operation for each initiation ~~relay.~~

[annotation: division] [annotation: circuit] [annotation: 18 month] [annotation: an Actuation Logic division]

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BASES

SURVEILLANCE REQUIREMENTS   (continued)

SR 3.3.8.5 → SR 3.3.8.6   [OPERABLE]

[The SCP has controls which require verification that the instrument channel functions as required by verifying the as-left and as-found ~~setting~~ are consistent with those established by the NRC-approved setpoint methodology.]

[settings]

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor.   The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy.   CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains ~~operational~~ between successive surveillances.

The ~~18 month~~ Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage ~~and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~

[18 month]   [CPIAS division]

SR 3.3.8.6 → SR 3.3.8.7   [accident analyses (~~Reference 1~~).]   [(Ref. 1)]

[The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every 18 months.]

This Surveillance ensures that the ~~train~~ actuation response times are less than or equal to the maximum times assumed in the ~~analyses~~.   The ~~18 month~~ Frequency is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.   Testing of the final actuating devices, which make up the bulk of the response time, is included in the Surveillance.

SR 3.3.8.7 → SR 3.3.8.8   [required CPIAS Manual Actuation division.]

Every 18 months, a CHANNEL FUNCTIONAL TEST is performed on the ~~CPIAS manual actuation channel.~~   [containment purge line isolation]

This test verifies that the actuation push buttons are capable of ~~opening contacts in the actuation logic as designed, de-energizing the initiation relays and~~ providing manual actuation of the Function.

REFERENCES

1. ~~DCD Tier 2, Chapter 15.~~

2. 10 CFR 50.34.   [FSAR Chapter 15.]

~~Chapter 15 (Transient and Accident Analyses).~~