KHNPDCDRAIsPEm Resource

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Sent: Wednesday, March 16, 2016 7:21 AM
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Cc: Harbuck, Craig; Dias, Antonio; Umana, Jessica; Ward, William
Subject: APR1400 Design Certification Application RAI 444-8530 (16 - Technical Specifications)
Attachments: APR1400 DC RAI 444 SPSB 8530.pdf

KHNP,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests, and we grant, the following RAI question response times. We may adjust the schedule accordingly.

16-131: 60 days
16-132: 45 days
16-133: 60 days
16-134: 60 days
16-135: 60 days

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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United States Nuclear Regulatory Commission
Protecting People and the Environment

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REQUEST FOR ADDITIONAL INFORMATION 444-8530

Issue Date: 03/16/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 16 - Technical Specifications
Application Section: 16.3.7, 16.3.3.8, 16.3.3.9, 16.3.3.10

QUESTIONS

16-131

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose TS prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. NUREG-1432, "Standard Technical Specifications-Combustion Engineering Plants," Rev. 4, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements. Staff needs to evaluate all technical differences from standard TS (STS) NUREG-1432, STS Combustion Engineering Plants, Rev. 4, which is referenced by the DC applicant in DCD Tier 2 Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the generic TS to ensure adequate protection of public health and safety, and the completeness and accuracy of the generic TS Bases.

Staff understands that each of the two AFW Divisions consists of one turbine-driven AFW pump train and one motor-driven AFW pump train that both only supply AFW to the one associated steam generator from the single divisional AFW Storage Tank. Staff notes that there appears to be

(i) No direct water flow path to the division's AFW pump suction header from the other division's AFW storage tank, in the normal system lineup.

However, Figure 10.4.9-1 Auxiliary Feedwater System Flow Diagram (Sheet 1 of 3) depicts a 10 inch pipe with two normally locked closed locally-operated manual valves connecting the two AFW storage tanks. It also depicts a 10 inch pipe with two normally locked closed locally-operated manual valves connecting the two divisional AFW pump 12 inch suction headers from each AFW storage tank. Between these valves is a 10 inch connection to supply raw water to one or both divisional AFW pump suction headers.

(ii) No water flow path from the division's AFW pump discharge header to supply AFW to the other steam generator, and

(iii) No steam flow path to the division's turbine-driven AFW pump's turbine from the non-associated steam generator (DCD Tier 2 Subsection 10.3.2.2.5).

Therefore, staff concludes that the two AFW divisions are completely independent, with no AFW storage tank suction cross-connect flow paths between them that can be unisolated remotely from the control room.

If one steam generator has a fault that degrades or defeats its heat sink function, the associated AFW division (both AFW Pump trains) may be unable to fulfill its function of reactor coolant heat removal by maintaining adequate water level in the associated steam generator.

Therefore, the applicant is requested to revise generic TS LCO 3.7.6 so that it requires two AFW Storage Tanks to be operable; this is necessary to support operability of both AFW divisions, both turbine-driven AFW Pump trains, and both motor-driven AFW Pump trains, as required by LCO 3.7.5 ("Four independent auxiliary feedwater (AFW) trains shall be OPERABLE.") and to meet the single failure critera.

The applicant is requested to revise generic TS LCO 3.7.5 to state: "The turbine-driven AFW pump train and the motor-driven AFW pump train associated with each steam generator shall be OPERABLE."

The first Condition statement of Action A of generic TS 3.7.5, which states, "Turbine driven AFW train inoperable due to one inoperable steam supply." Since only one of the two main steam lines on each steam generator is connected to the associated turbine-driven AFW pump turbine steam supply pipe, the first Condition statement of Action A of generic TS 3.7.5, which is based on STS 3.7.5 Action A, does not apply to the APR1400 design. The applicant is requested to remove the first Condition statement of Action A from generic TS 3.7.5.

Generic TS 3.7.5 Condition C is based on STS 3.7.5 Condition C, which assumes an AFW system design having two independent motor driven AFW pumps and one turbine-driven AFW pump each capable of supplying AFW to either steam generator, with the turbine-driven AFW pump turbine capable of being supplied steam from either steam generator. Generic TS 3.7.5 Condition C states:

> One turbine driven AFW train inoperable due to associated inoperable steam supply.
>
> AND
>
> One motor driven AFW train inoperable.

Since each turbine-driven AFW pump turbine only gets steam from its associated steam generator through a single steam supply line, there is no need to consider how the turbine-driven pump was made inoperable. The relevant concern is whether two AFW trains are inoperable in the same AFW division or one train is inoperable in both AFW divisions. It is not clear that the STS 3.7.5 Action C Completion Time of 48 hours is justified for either of these APR1400 Conditions:

- One AFW division with two AFW pump trains inoperable
- Two AFW divisions with one AFW pump train inoperable

The applicant is requested to replace generic TS 3.7.5 Action C with one or more Actions for the above two Conditions, with appropriate Required Actions and Completion Times. Appropriate Bases discussions that justify the new Actions must also be provided.

16-132

On Deviation Report page 90, generic TS SR 3.6.2 1 includes the following:

> The acceptance criteria for air lock testing are:
>
> a. Overall air lock leakage rate is ≤ 0.05 L_a when tested at ≤ P_a [3.77 kg/cm2 (53.6 psig)].
>
> b. For each door seal leak rate is ≤ 0.01 L_a when tested at ≤ P_a [3.77 kg/cm2 (53.6 psig)].

This information is not included in STS SR 3.6.2.1, but is included in STS 5.5.16.d.2. It is also included in generic TS 5.5.16.d.2, but the individual door leak rate criterion is:

> d. Leakage rate acceptance criteria are:
>
> 2. Air lock testing acceptance criteria are:
>
> ii. For each door, leakage rate is ≤ 0.01 L_a when pressurized to ≥ 10 psig.

In addition, generic TS 5.5.16.b states:

> b. The calculated peak containment internal pressure for the design basis loss of coolant accident, P_a is 51.77 psig. The containment design pressure is 60 psig.

The program specification values for Pa and the airlock door test pressure differ from the values stated in the Deviation Report and generic TS SR 3.6.2.1.

The applicant is requested to remove the criteria from SR 3.6.2.1 and verify the airlock leak test acceptance criteria values are consistent with DCD Tier 2 Chapter 6 values. Also make any necessary conforming changes to the Bases for SR 3.6.2.1.

16-133

The applicant is requested to revise generic TS 3.3.8, “Containment Purge Isolation Actuation Signal (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 monitor~~s~~ **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 append an explanation of the differences 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 analysi~~e~~s 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. Containment 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:

A.1

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.

C.1, C.2.1, C.2.2

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.”

16-134

The applicant is requested to revise generic TS 3.3.9, “Control Room Emergency Ventilation Actuation Signal (CREVAS),” as follows (See DCD Figure 7.3-11):

1. Change LCO statement to say, “One CREVAS **instrument division with one radiation monitor** channel**, one Manual Actuation division, and one Actuation Logic division** shall be OPERABLE.” Also make conforming changes to the Bases for generic TS 3.3.9.

2. Revise Condition A as follows: “CREVAS **required** Manual Actuation **division**, **required** Actuation Logic **division**, or **required instrument division with** one ~~or more~~ required ~~channels of~~ radiation monitor~~s~~ **channel** inoperable in MODES 1, 2, 3, and 4.” Also make conforming changes to the Bases for generic TS 3.3.9.

3. Revise Required Action A.1 to define acronym ‘HVAC” as follows: “Place one control room area **heating, ventilation, and air conditioning (**HVAC**)** system train in emergency operation mode. | 1 hour”

4. Revise Condition C as follows: “CREVAS **required** Manual Actuation **division**, **required** Actuation Logic **division**, or **required instrument division with** one ~~or more~~ required ~~channels of~~ radiation monitor~~s~~ **channel** inoperable during CORE ALTERATIONS or movement of irradiated fuel assemblies.” Also make conforming changes to the Bases for generic TS 3.3.9.

5. To be consistent with STS 3.3.9B, SR 3.3.9.3, Channel Functional Test on “required CRIS Actuation Logic channel,” revise surveillance column Note for generic TS SR 3.3.9.3 as indicated: “Surveillance ~~Requirement~~ of Actuation Logic shall include verification of proper operation of each initiation circuit. In addition, the STS SR 3.3.9.3 Note says “Surveillance of Actuation Logic shall include the verification of the proper operation of each initiation relay.” Explain the difference between “initiation circuit” and “initiation relay.”

6. To be consistent with suggested edits to LCO 3.3.9, and Conditions A and C, revise SR 3.3.9.3 as indicated: “Perform CHANNEL FUNCTIONAL TEST on required CPIAS Actuation Logic ~~channel~~ **division**.” Also make conforming changes to the Bases for generic TS 3.3.9.

7. Applicant is requested to revise the Bases for Specification 3.3.9 to be consistent with the requested changes to the Bases for Specification 3.3.8.

16-135

The applicant is requested to revise generic TS 3.3.10, “Fuel Handling Area Emergency Ventilation Actuation Signal (FHEVAS),” as follows (See DCD Figure 7.3-9):

1. Change LCO statement to say, “One FHEVAS **instrument division with one radiation monitor** channel**, one Manual Actuation division, and one Actuation Logic division** shall be OPERABLE.” Also make conforming changes to the Bases for generic TS 3.3.10.

2. Revise Condition A as follows: “**Required Manual Actuation division**, **required** Actuation Logic **division**, ~~Manual Actuation,~~ **or required instrument division with required** radiation ~~monitors channels~~ **monitor channel** inoperable.” Also make conforming changes to the Bases for generic TS 3.3.10.

3. For consistency with STS 3.3.10B, revise Required Action A.1 to define acronym ‘HVAC” as follows: “Place one **OPERABLE** fuel handling area **heating, ventilation, and air conditioning (**HVAC**)** system train in emergency operation mode. | Immediately” Also make conforming changes to the Bases for generic TS 3.3.10.

4. Generic TS SR 3.3.10.1 says, “Perform CHANNEL CHECK on required FHEVAS radiation monitor channel.” If only one channel is required, how is this surveillance accomplished?

5. STS 3.3.10B, SR 3.3.10.3 surveillance column Note, says “Testing of Actuation Logic shall include the actuation of each initiation relay and verification of the proper operation of each ignition relay.” Generic TS SR 3.3.10.3 surveillance column Note says “Testing of Actuation Logic shall include actuation of each initiation circuit and verification of proper operation of each initiation circuit.” Explain difference between “initiation relay” and “initiation circuit.” Also, revise generic TS SR 3.3.10.3 as indicated: “Perform CHANNEL FUNCTIONAL TEST on required FHEVAS **Actuation** Logic ~~channel~~ **division**.

6. Revise generic TS SR 3.3.10.4 as indicated: “Perform CHANNEL FUNCTIONAL TEST on required FHEVAS Manual Actuation ~~channel~~ **division**.

7. Revise generic TS SR 3.3.10.6 as indicated: Verify that the response time of required FHEVAS ~~channel~~ **division** is within limits.

8. Applicant is requested to revise the Bases for Specification 3.3.10 to be consistent with the requested changes to the Bases for Specification 3.3.8.


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