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Ron Gaston
Director, Nuclear Licensing

10 CFR 50.90

W3F1-2021-0004

April 5, 2021

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: License Amendment Request to Relocate Chemical Detection Systems Technical Specifications to the Technical Requirements Manual

Waterford Steam Electric Station, Unit 3
NRC Docket No. 50-382
Renewed Facility Operating License No. NPF-38

As required by 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests an amendment to Appendix A, "Technical Specifications" of Renewed Facility Operating License No. NPF-38 for Waterford Steam Electric Station, Unit 3 (Waterford 3).

The proposed change will revise Waterford 3 Technical Specifications (TS) to remove TS 3.3.3.7.1 and 3.3.3.7.3, "Chemical Detection Systems," and references to the TS and relocate the information to the Licensee controlled Technical Requirements Manual (TRM). The TRM is part of the Final Safety Analysis Report (FSAR) and any changes to the TRM are subject to the criteria of 10 CFR 50.59. Additionally, the proposed change will relocate Surveillance Requirement (SR) 4.7.6.1.d.4 to the TRM.

These proposed changes are consistent the NRC's "Final Policy Statement on Technical Specifications Improvements," (58 FR 39132), which was issued in July 1993. The NRC codified the four criteria in 10 CFR 50.36(c)(2)(ii) in July 1995 (60 FR 36959). The proposed changes are also consistent with NUREG-1432, "Standard Technical Specifications – Combustion Engineering Plants," Revision 4.

The Enclosure to this letter provides an evaluation of the proposed changes. Attachment 1 to the Enclosure provides the existing TS pages, marked-up to show the proposed changes. Attachment 2 provides the clean pages of the proposed TS changes. Attachment 3 provides a bounding risk assessment of the chemical detection systems.

Approval of the proposed amendment is requested by May 5, 2022. Once approved, the amendment shall be implemented within 60 days.

There are no regulatory commitments contained in this request.

In accordance with 10 CFR 50.91, Entergy is notifying the State of Louisiana of this license amendment request, by transmitting a copy of this letter and enclosure to the designated State Official.

If there are any questions or if additional information is needed, please contact Paul Wood, Waterford Regulatory Assurance Manager, at (504) 464-3786.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 5th day of April 2021.

Sincerely,

Ron Gaston

RWG/rrd

Enclosure: Evaluation of the Proposed Change

Attachments to Enclosure:

1. Technical Specification (TS) Page Markups
2. Technical Specification (TS) Clean Pages
3. Bounding Risk Assessment of the Chemical Monitoring Systems

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Waterford Steam Electric Station, Unit 3
Designated State Official Louisiana
NRC Project Manager – Waterford Steam Electric Station, Unit 3

Enclosure

W3F1-2021-0004
Evaluation of the Proposed Change

EVALUATION OF THE PROPOSED CHANGE

1.0 SUMMARY DESCRIPTION

The proposed amendment would modify Technical Specifications (TSs) associated with Waterford Steam Electric Station, Unit 3 (Waterford 3) Renewed Facility Operating License No. NPF-38 to relocate the Chlorine Detection System and Broad Range Gas Detection TSs (i.e., TS 3.3.3.7.1 and TS 3.3.3.7.3) to the Entergy-controlled Technical Requirements Manual (TRM). Additionally, Surveillance Requirement (SR) 4.7.6.1.d.4 is being proposed for relocation to the TRM. The requested change involves no significant hazards consideration.

This requested license amendment proposes to relocate the Chemical Detection Systems TSs to the Waterford TRM. The proposed relocation is consistent with the NRC's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132) issued in July 1993, which provided a specific set of four (4) objective criteria to determine which of the design conditions and associated surveillances should be located in the TSs as limiting conditions for operation (LCOs). The Final Policy Statement noted that implementation of these additional criteria, as amended to 10 CFR 50.36(c)(2)(ii), may cause some requirements presently in TSs to no longer merit inclusion in TSs.

2.0 DETAILED DESCRIPTION

The proposed amendment would relocate the following operability and surveillance requirements from the Waterford 3 TS to the Waterford 3 Technical Requirements Manual (TRM):

- 3.3.3.7.1, Chlorine Detection System
- 3.3.3.7.3, Broad Range Gas Detection

These TSs ensure the availability of instrumentation to monitor control room outside air intakes for toxic gases from off-site releases and isolate the control room ventilation system in the event monitored levels exceed established limits.

This change proposes that the Chlorine Detection and Broad Range Gas Detection Systems contained in TS 3.3.3.7.1 and TS 3.3.3.7.3 with their Limiting Condition for Operation, associated Actions, and Surveillance Requirements be relocated to the TRM. The associated Bases will also be relocated to the TRM.

Additionally, SR 4.7.6.1.d.4, which verifies that on a toxic gas detection signal the control room emergency air filtration system automatically switches to the isolation mode of operation, is being proposed for relocation the TRM.

2.1 System Design and Operation

Redundant chlorine detectors are provided near the Control Room Air Conditioning System normal outside air intake. The chlorine detectors use diffusion-type electrochemical probes.

Upon detection of chlorine, the control room envelope is automatically placed in the isolated mode and the Reactor Auxiliary Building (RAB) Normal Ventilation System is shut down. The chlorine detectors are provided with outputs to sound an alarm in the main control room. The

chlorine concentration readout is available from the plant monitoring computer and appears on a digital display panel in the control room.

Similarly, a Broad Range Gas Detection System which continuously monitors incoming control room air for the presence of a large variety of toxic gases is installed on the Control Room air intake duct. If toxic gas concentration equals or exceeds the high setting, the detector system sounds an alarm and automatically isolates the control room before toxic or immediately dangerous to life or health (IDLH) levels can be reached.

Each Broad Range Detection system consists of an analyzer panel that utilizes continuous scan Fourier Transform Infrared (FTIR) sensing technology. The monitor samples the air and automatically analyzes for the presence of gases and vapors of chemicals for which the computer has been programmed.

The broad range gas detectors are designed to be very sensitive to numerous gases. The control room will be isolated when the concentration of any of the monitored gases exceeds the designated setpoint. A display of the specific gases and their concentrations is provided in the control room.

2.2 Current TS Requirements

CHLORINE DETECTION SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.3.7.1 Two independent chlorine detection systems, with their alarm/trip setpoints adjusted to actuate at a chlorine concentration of less than or equal to 2 ppm, shall be OPERABLE.

APPLICABILITY: All MODES

ACTION:

a. With one chlorine detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

b. With no chlorine detection system OPERABLE , within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.1 Each chlorine detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK in accordance with the Surveillance Frequency Control Program and a CHANNEL CALIBRATION in accordance with the Surveillance Frequency Control Program.

BROAD RANGE GAS DETECTION

LIMITING CONDITION FOR OPERATION

3.3.3.7.3 Two independent broad range gas detection systems shall be OPERABLE** with their alarm/trip setpoints adjusted to actuate at the lowest achievable Immediately Dangerous to Life or Health gas concentration level of detectable toxic gases* providing reliable operation.

APPLICABILITY: All MODES

ACTION:

a. With one broad range gas detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

b. With no broad range gas detection system OPERABLE, within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.3 Each broad range gas detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK in accordance with the Surveillance Frequency Control Program, and a CHANNEL FUNCTIONAL TEST in accordance with the Surveillance Frequency Control Program. The CHANNEL FUNCTIONAL TEST will include the introduction of a standard gas.

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*Including Ammonia

** The requirements of Technical Specification 3.0.1 do not apply during the time (two minutes or less) when the instrument automatic background/reference spectrum check renders the instrument(s) Inoperable.

CONTROL ROOM EMERGENCY AIR FILTRATION SYSTEM

SURVEILLANCE REQUIREMENTS (Excerpt)

4.7.6.1 Each control room air filtration train (S-8) shall be demonstrated OPERABLE: …

d. In accordance with the Surveillance Frequency Control Program by:

4. Verifying that on a toxic gas detection signal, the system automatically switches to the isolation mode of operation, except for dampers and valves that are locked, sealed, or otherwise secured in the actuated position in Modes 5, 6, or defueled.

The Standard Technical Specifications (STS), NUREG-1432 Revision 4, does not contain the above listed Technical Specifications.

2.3 Reason for the Proposed Change

The proposed change relocates chemical detection system TSs that do not meet the 10 CFR 50.36 requirements for retention in TS and are not included in the NUREG-1432 Revision 4, Standard Technical Specifications – Combustion Engineering Plants. This proposed change establishes consistency with the NUREG-1432, Revision 4.

The basis for the relocation is the NRC's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132) issued in July 1993, which provided a specific set of four (4) objective criteria to determine which of the design conditions and associated surveillances should be located in the TSs as limiting conditions for operation. The Final Policy Statement noted that implementation of these additional criteria, as codified in 10 CFR 50.36(c)(2)(ii), may cause some requirements presently in TSs to no longer merit inclusion in TSs.

2.4 Description of the Proposed Change

This change relocates the TSs listed below (included are the Limiting Condition for Operation, associated Actions, Surveillance Requirements, and Bases) to the Waterford 3 Technical Requirements Manual (TRM).

- 3.3.3.7.1, Chlorine Detection System
- 3.3.3.7.3, Broad Range Gas Detection

Neither the design of the chemical detection systems nor the control room boundary isolation equipment are being changed by this request.

Additionally, SR 4.7.6.1.d.4, which verifies that on a toxic gas detection signal the control room emergency air filtration system automatically switches to the isolation mode of operation, is being proposed for relocation to the TRM.

3.0 TECHNICAL EVALUATION

The proposed license amendment relocates TSs 3.3.3.7.1 and 3.3.3.7.3 and SR 4.7.6.1.d.4 to the TRM. NUREG-1432, Standard Technical Specifications – Combustion Engineering Plants, does not contain any of these specifications or surveillance requirements. Therefore, this change is consistent with NUREG-1432. In addition, 10 CFR 50.36, Technical Specifications, lists four criteria (10 CFR 50.36(c)(2)(ii)) that require the establishment of a Limiting Condition for Operation.

An assessment of the subject Chlorine Detection System and Broad Range Gas Detection Systems against the four criteria of 10 CFR 50.36 is provided below.

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

> This criterion addresses instrumentation installed to detect excessive reactor coolant system (RCS) leakage. Waterford 3 TSs 3.3.3.7.1 and 3.3.3.7.3 do not cover installed instrumentation that is used to detect and indicate in the control room, a significant degradation of the reactor coolant pressure boundary. The Chlorine Detection and Broad Range Gas Detection Systems ensure that an accidental chlorine or toxic gas release will be detected promptly, and the necessary protective actions will be automatically initiated to provide protection for control room personnel. Therefore, neither the Chlorine Detection System nor the Broad Range Gas Detection Systems, satisfy Criterion 1.

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

> The purpose of this criterion is to capture those process variables that have initial values assumed in the design basis accident and transient analyses, and that are monitored and controlled during power operation. This criterion also includes active design features (e.g., high-pressure/low-pressure system valves and interlocks) and operating restrictions (pressure/temperature limits) needed to preclude unanalyzed accidents and transients.
>
> The Chlorine Detection and Broad Range Gas Detection Systems ensure that an accidental chlorine or toxic gas release will be detected promptly, and the necessary protective actions will be automatically initiated to provide protection for control room personnel. These detection systems do not involve process variables that have initial values assumed in the design basis accident and transient analyses, and that are monitored and controlled during power operation. Therefore, neither the Chlorine Detection System nor the Broad Range Gas Detection System, satisfy Criterion 2.

Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

> The purpose of this criterion is to capture only those structures, systems, and components that are part of the primary success path of the safety analysis (an examination of the actions required to mitigate the consequences of the design basis accident and transients). The primary success path of a safety analysis consists of the combinations

and sequences of equipment needed to operate so that the plant response to the design basis accident and the transients limits the consequences of these events to within the appropriate acceptance criteria. Also captured by this criterion are those support and actuation systems that are necessary for items in the primary success path to successfully function, but the criterion does not include backup and diverse equipment.

The Chlorine and Broad Range Gas Detection Systems ensure that an accidental chlorine or toxic gas release will be detected promptly, and the necessary protective actions will be automatically initiated to provide protection for control room personnel. These detection systems do not function or actuate to mitigate a design basis accident or transient that either assumes the failure of, or presents a challenge to, the integrity of a fission product barrier. None of the functions of the chemical detection systems to detect, alarm and isolate the control room ventilation system are credited in the chapter 15 FSAR safety analysis.

The removal of SR 4.7.6.1.d.4 from TS does not impact the safety function of the control room emergency filtration system or the requirement to perform SR 4.7.6.1.d.2 which verifies that on a safety injection actuation test signal or a high radiation test signal, the emergency filtration train automatically switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks and the normal outside airflow paths isolate. Therefore, neither the Chlorine Detection System nor the Broad Range Gas Detection System, satisfy Criterion 3.

Criterion 4: A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The purpose of this criterion is to capture only those structures, systems, and components that operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The Chlorine and Broad Range Gas Detection Systems ensure that an accidental chlorine or toxic gas release will be detected promptly, and the necessary protective actions will be automatically initiated to provide protection for control room personnel. The Chlorine Detection System and Broad Range Gas Detection Systems are not credited in the FSAR chapter 15 safety analysis. Also the Chlorine Detection System and Broad Range Gas Detection Systems are not structures, systems, or components that operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Waterford 3 is located in an area with a variety of potential toxic hazards. Mississippi River barge traffic, nearby chemical processing/storage facilities, underground pipelines, and nearby rail lines all contain potential hazards. Per TS 6.9.1.9, nearby hazards are documented every four years with updated data to ensure the presence and quantity of hazards are known and analyzed. Attachment 3 of this Enclosure contains a bounding risk assessment evaluating the threat outside toxic hazards (including chlorine) pose to the site. The resulting Core Damage Frequency (CDF) estimate from this bounding analysis is 6.70E-8/year. This is considerably less than the other analyzed hazards groups (i.e., internal events, internal flooding, and fire), and thus, would not be considered significant to public health and safety.

Therefore, neither the Chlorine Detection System nor Broad Range Gas Detection System, satisfy Criterion 4.

The requirements contained in TS 3.3.3.7.1, 3.3.3.7.3, and TS SR 4.7.6.1.d.4 do not meet any of the 10 CFR 50.36(c)(2)(ii) criteria for items that must be in the TS. In addition, NUREG-1432, Standard Technical Specifications – Combustion Engineering Plants, does not contain any of these specifications. Therefore, this change is consistent with NUREG-1432.

The proposed changes do not alter the physical design of any plant structure, system, or component. Therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not require any new or unusual operator actions. The proposed changes do not introduce any new failure modes that could result in a new accident. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes.

Therefore, the Chlorine Detection System and Broad Range Gas Detection System operability and surveillance requirements, and the surveillance requirement for verification that the control room emergency air filtration system switches to the isolation mode upon a toxic gas detection signal, may be relocated to the TRM. System design and function of the associated components will continue to be maintained. The Control Room Habitability Program stipulated by TS 6.5.17 is not affected by the relocation of these operability and surveillance requirements to the TRM. Any change to these systems will be reviewed in accordance with 10 CFR 50.59 to determine if the change requires prior NRC review and approval.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The proposed amendment relocates the chemical detection TSs (Chlorine and Broad Range Gas Monitors) to the TRM and removes a surveillance requirement. The applicable General Design Criteria (GDC) and the responses from the Waterford FSAR are provided below.

CRITERION 19 – CONTROL ROOM

CRITERION:
A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident.

Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.
.

RESPONSE:
Following proven power plant design philosophy, all control stations, switches, controllers and indicators necessary to operate and shut down the nuclear unit and maintain safe control of the facility are located in one common control room.

The design of the main control room permits safe occupancy during abnormal conditions without personnel receiving radiation exposure in excess of five rem whole body or its equivalent. Shielding is designed to maintain tolerable radiation exposure levels in the main control room for postulated accident conditions, including a loss-of-coolant accident. The main control room is pressurized relative to the outside atmosphere following the occurrence of a radiological accident. Food, water and other habitability systems are provided for main control room personnel for the duration of any postulated accident. Positive air pressure is maintained in the main control room after receipt of a safety injection actuation signal or a high radiation signal. The Main Control Room Air Conditioning System is provided with radiation and toxic chemical detectors and alarms. The main control room is isolated during a postulated toxic chemical accident. Provisions are made for main control room air to be recirculated through high-efficiency particulate and charcoal filters following any accident. Emergency lighting is provided.

Alternate controls and instruments at a location outside the main control room are available for those items of equipment required to bring the plant to, and maintain it in, a hot standby condition. It is also possible to reach a cold shutdown condition from locations outside of the main control room in a reasonable period of time through the use of suitable procedures.

The two Regulatory Guides (RG) below also relate to toxic gas monitoring and discussed in the FSAR.

RG 1.78 – ASSUMPTIONS FOR EVALUATING THE HABITABILITY OF A NUCLEAR POWER PLANT CONTROL ROOM DURING A POSTULATED CHEMICAL RELEASE (Revision 0, June 1974)

RG 1.95 – PROTECTION OF NUCLEAR POWER PLANT CONTROL ROOM OPERATORS AGAINST AN ACCIDENTAL CHLORINE RELEASE (February 1975)

FSAR Section 2.2.3.3.6 references RG 1.78 guidance when analyzing shipment frequencies of hazardous chemical in the vicinity of Waterford 3. And FSAR Section 6.4.4.2 references RG 1.95 limitations on control room isolation time upon detection of chlorine. Neither the method of analyzing hazardous chemical shipments nor the control room isolation time characteristics are affected by the proposed changes. Therefore, none of the responses to the criterion above or the method of meeting the RGs described in the FSAR are affected by this change. Also, the proposed change does not affect compliance with these regulations or guidance and will continue to ensure that the lowest functional capabilities or performance levels of equipment required for safe operation are met.

4.2 Defense in Depth

The relocation of the Chemical Detection Systems TSs to the TRM does not alter the design, function, or operation of these systems. However, it is important to note that there are multiple backup means in place that provide the defense in depth for protecting the control room operators from a toxic gas event at a nearby facility. As noted in Supplement 6 to the Waterford 3 Safety

Evaluation Report (Reference 11), there are several provisions in place to provide toxic gas protection of the control room operators. These include a hotline communication system between Waterford 3 and the St. Charles Parish Emergency Operations Center (EOC), and a periodic survey of the local industrial and transportation activities every four years in accordance with TS 6.9.1.9.

Also, the Operation Off-Normal Procedure, OP-901-520, "Toxic Chemical Release," provides guidance when any unexplained, extremely pungent or irritating odor is reported on site, which includes donning of air breathing apparatus and verification of Control Room Isolation alignment.

4.3 Precedent

A similar change, to relocate the operability and surveillance requirements for the Chemical Detection Systems from TS to a licensee-controlled document, was approved by the NRC by issuance of Amendment Nos. 76 and 65 for South Texas Project, Units 1 and 2, respectively, by letter dated July 6, 1995 (Reference 6). In section 3.0 of that safety evaluation the NRC states that:

> "The chemical detection system instrumentation is used to detect an accidental toxic gas release, and isolate the control room atmosphere. However, the capability to isolate the control room is not part of the primary success path to prevent or mitigate a design basis accident or transient that challenges the fission product barriers in the plant design. Further, the chemical detection instrumentation is not relied upon to measure parameters that are initial condition assumptions for a design basis accident or transient, or used to detect a significant abnormal degradation of the reactor coolant pressure boundary. Therefore, the requirements specified in these existing TSs do not satisfy the criteria for TSs, and may be relocated to the UFSAR such that future changes to these provisions may be made pursuant to 10 CFR 50.59."

The basis provided for the Waterford 3 request in addressing the 10 CFR 50.36 criteria is consistent with that of the approved South Texas Project amendment request.

4.4 No Significant Hazards Consideration Analysis

Entergy Operations, Inc. (Entergy) has evaluated the proposed changes to the Technical Specifications (TSs) using the criteria in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazards consideration.

Entergy proposes a change to the Waterford 3 TSs that would relocate TS 3.3.3.7.1, and TS 3.3.3.7.3 (including all associated Limiting Condition for Operations, Actions, and Surveillance Requirements) as well as SR 4.7.6.1.d.4 to the Waterford 3 TRM.

Basis for no significant hazards consideration determination: As required by 10 CFR 50.91(a), Entergy analysis of the issue of no significant hazards consideration is presented below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed changes do not alter the physical design of any plant structure, system, or component; therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. Operation or failure of the Chlorine Detection System and the Broad Range Gas Detection System are not assumed to be initiators of any analyzed event in the Final Safety Analysis Report (FSAR) and cannot cause an accident. Whether the requirements for the Chlorine Detection System and the Broad Range Gas Detection System are in TS or another licensee-controlled document has no effect on the probability or consequences of any accident previously evaluated.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes do not alter the plant configuration (no new or different type of equipment is being installed) or require any new or unusual operator actions. The proposed changes do not alter the safety limits or safety analysis assumptions associated with the operation of the plant. The proposed changes do not introduce any new failure modes that could result in a new accident. The proposed changes do not reduce or adversely affect the capabilities of any plant structure, system, or component in the performance of their safety function. Also, the response of the plant and the operators following the design basis accidents is unaffected by the proposed changes.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed changes involve a significant reduction in a margin of safety?

Response: No

The proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analyses. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above evaluation, Entergy concludes that the proposed amendment involves no significant hazards consideration under the standards set forth in 10 CFR 50.92, paragraph (c), “Issuance of Amendment.”

4.5 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed change would change the location of a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9), "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review." Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed change.

6.0 REFERENCES

1. Waterford Steam Electric Station Final Safety Analysis Report (FSAR), Section 13.8 “Technical Requirements.”

2. 10 CFR 50.36, “Technical Specifications.”

3. NUREG-1432, “Standard Technical Specifications-Combustion Engineering (CE) Plants,” Revision 4.0, dated April 2012.

4. NRC “Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors,” 58 FR 39132, dated July 22, 1993.

5. NRC Final Rule, 10 CFR 50.36, “Technical Specifications,” 60 FR 36953, dated July 19, 1995.

6. Letter from T. W. Alexion (USNRC) to W. T. Cott, Houston Lighting & Power Company, “South Texas Project, Units 1 and 2 – Amendment Nos. 76 and 65 to Facility Operating License Nos. NPF-76 and NPF-80 (TAC Nos. M91611 and M91612),” dated July 6, 1995.

7. Waterford Steam Electric Station Final Safety Analysis Report (FSAR), Section 2.2.3.3.6 “Evaluation of Other Stationary Toxic Chemical Sources - Results.”

8. PSA-WF3-07-01 Rev 1, Waterford 3 Re-Examination of External Events Evaluation in the IPEEE, February 2021.

9. LBDCR 20-024, Changes to FSAR Chapter based on Engineering Report WF3-IC-15-00001, 2020 Survey of Hazardous Chemicals Stored, Processed, or Transported in the Vicinity of Waterford 3 Steam Electric Station.

10. NRC Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 3 (ADAMS Accession No. ML17317A256), dated January 2018.

11. NUREG-0787 Supplement 6, “Safety Evaluation Report related to the operation of Waterford Steam Electric Station, Unit No. 3,” dated June 1984.

ATTACHMENTS

1. Technical Specification (TS) Page Markups

2. Technical Specification (TS) Clean Pages

3. Bounding Risk Assessment for BRGM and Chlorine Detection Systems

Enclosure
Attachment 1

W3F1-2021-0004
Technical Specification (TS) Page Markups

TS Pages
3/4 3-47 (LCO 3.3.3.7.1)
3/4 3-48a (LCO 3.3.3.7.3)
3/4 7-17 (SR 4.7.6.1)

INSTRUMENTATION

CHEMICAL DETECTION SYSTEMS

CHLORINE DETECTION SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.3.7.1 Two independent chlorine detection systems, with their alarm/trip setpoints adjusted to actuate at a chlorine concentration of less than or equal to 2 ppm, shall be OPERABLE.

APPLICABILITY: All MODES.

ACTION:

a. With one chlorine detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

b. With no chlorine detection system OPERABLE, within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.1 Each chlorine detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK in accordance with the Surveillance Frequency Control Program and a CHANNEL CALIBRATION in accordance with the Surveillance Frequency Control Program.

DELETE

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REPLACE with:

INSTRUMENTATION

CHEMICAL DETECTION SYSTEMS

BROAD RANGE GAS DETECTION

LIMITING CONDITION FOR OPERATION

3.3.3.7.3 Two independent broad range gas detection systems shall be OPERABLE ** with their alarm/trip setpoints adjusted to actuate at the lowest achievable Immediately Dangerous to Life or Health gas concentration level of detectable toxic gases* providing reliable operation.

APPLICABILITY: All MODES.

ACTION:

a. With one broad range gas detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

b. With no broad range gas detection system OPERABLE, within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.3 Each broad range gas detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK in accordance with the Surveillance Frequency Control Program, and a CHANNEL FUNCTIONAL TEST in accordance with the Surveillance Frequency Control Program. The CHANNEL FUNCTIONAL TEST will include the introduction of a standard gas.

DELETE

Page 3/4 3-48a is not used

REPLACE with:

*Including Ammonia

** The requirements of Technical Specification 3.0.1 do not apply during the time (two minutes or less) when the instrument automatic background/reference spectrum check renders the instrument(s) inoperable.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 0.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C and a relative humidity of 70%.

3. Verifying a system flow rate of 4225 cfm ±10% during train operation when tested in accordance with ANSI N510-1975.

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 0.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C and a relative humidity of 70%.

d. In accordance with the Surveillance Frequency Control Program by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 7.8 inches water gauge while operating the train at a flow rate of 4225 cfm ±10%.

2. Verifying that on a safety injection actuation test signal or a high radiation test signal, the train automatically switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks and the normal outside airflow paths isolate.

3. Verifying that heaters dissipate 10 +1.0, -1.0 kW when tested in accordance with ANSI N510-1975.

DELETE

4. Verifying that on a toxic gas detection signal, the system automatically switches to the isolation mode of operation.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the train at a flow rate of 4225 cfm ±10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the train at a flow rate of 4225 cfm ±10%.

g. Perform required control room envelope unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.

Enclosure
Attachment 2

W3F1-2021-0004
Technical Specification (TS) Clean Pages

TS Pages
3/4 3-47 (LCO 3.3.3.7.1)
3/4 3-48a (LCO 3.3.3.7.3)
3/4 7-17 (SR 4.7.6.1)

Page 3/4 3-47 is not used

Page 3/4 3-48a is not used

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 0.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C and a relative humidity of 70%.

3. Verifying a system flow rate of 4225 cfm ±10% during train operation when tested in accordance with ANSI N510-1975.

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 0.5%when tested in accordance with ASTM D3803-1989 at a temperature of 30°C and a relative humidity of 70%.

d. In accordance with the Surveillance Frequency Control Program by:

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 7.8 inches water gauge while operating the train at a flow rate of 4225 cfm ±10%.

2. Verifying that on a safety injection actuation test signal or a high radiation test signal, the train automatically switches into a recirculation mode of operation with flow through the HEPA filters and charcoal adsorber banks and the normal outside airflow paths isolate.

3. Verifying that heaters dissipate 10 +1.0, -1.0 kW when tested in accordance with ANSI N510-1975.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the train at a flow rate of 4225 cfm ±10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the train at a flow rate of 4225 cfm ±10%.

g. Perform required control room envelope unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.

Enclosure
Attachment 3

W3F1-2021-0004
Bounding Risk Assessment for BRGM and Chlorine Detection Systems

BOUNDING RISK ASSESSMENT FOR BRGM AND CHLORINE DETECTION SYSTEMS

Scope and Purpose

This attachment documents a bounding risk evaluation for the potential for an external toxic event to result in core damage. The Broad Range Gas Monitors (BRGMs) and Chlorine Monitors are not in the Waterford 3 PRA model, but this assessment uses documented information on the potential hazards, and estimated system failure information to assess the potential risk associated with the hazards.

Assumptions

- It was assumed that all the operators will be immediately incapacitated by exposures to concentrations exceeding the immediately dangerous to life or health (IDLH) limits. In fact, the IDLH is defined as a level to which a person can be exposed for 30 minutes without escape-impairing symptoms or permanent health effects.
- No credit for backup crews or alternate personnel taking control room actions is credited.
- The calculated release rate was maximized by assuming an instantaneous, complete rupture of the off-site hazard (i.e., a storage tank) and overly rapid expansion of the spill area.
- Waterford 3 is located in St. Charles Parish. This area has numerous potential toxic hazards (railroad, chemical processing/storage, pipelines, Mississippi River barge traffic). There is an industrial hotline that is set up to automatically alert the population if a hazard is present. This hotline will provide information and response instructions when activated. No credit for site or operator response to a warning or alert is included in this evaluation.
- Given a toxic event that incapacitates the operations crew, the lack of operator action is conservatively assumed to lead to a reactor trip after 24 hours have elapsed. This assumption is based on cumulative failures such as lack of boron dilution and lack of letdown flow modifications.

Risk Calculation Inputs

Per FSAR Section 2.2.3.3.6, the overall probability that toxic chemicals frequently transported in the vicinity of Waterford 3 could pose a potential hazard to the Waterford 3 control room personnel is approximately 6.70E-06 per year. This value is from the 2020 update of documented toxic hazards near the site (Reference 8).

The noted value is further broken down by threats from chlorine and non-chlorine toxins. The documents note that 1.71E-06/yr, is the contribution from chlorine sources. Per FSAR Section 6.4.4.2.a, this hazard is monitored by chlorine-specific monitors. That leaves a 4.74E-06/yr contribution from other toxic hazards. The BRGMS work to protect operators from this hazard.

Normal operation is for two trains of both the BRGMS and the Chlorine Detection system to be operating (each system has two independent trains). Detailed system failure information was not obtained. For this simplified evaluation, a total system failure probability of 0.01 is conservatively assigned. Note these are currently Technical Specification systems that are in constant operation and subject to routine surveillance tests. These failure estimates are likely artificially high.

The probability of a reactor trip is assumed to be 1.0. The probability of a reactor trip is conservatively assumed to be once per year and lack of operator action due to incapacitation is also conservatively assumed to lead to a reactor trip after 24 hours have elapsed, due to cumulative failures such as lack of boron dilution and lack of letdown flow modifications.

Following a Reactor Trip, long-term actions must be taken by the Operators within the first 24 hours to align an alternate source of water for the Emergency Feedwater system, cooldown and alignment of the Shutdown Cooling system, makeup and boration of the Reactor Coolant System to account for Xenon decay, etc. If the Operators are incapacitated, these actions are assumed to fail, and thus damage to the core is likely. Thus, the Conditional Core Damage Probability (CCDP) is assumed to be 1.0.

NUREG/CR-2650 suggests a value of 0.1 for the probability that incapacitation of the operators would lead to a radiological release in excess of 10 CFR 50.67 guidelines. All of this release is conservatively assumed to be large and early. Thus, the Conditional Large Early Release Probability (CLERP) is assumed to be 0.1.

Risk Evaluation

Using the values determined above, the overall risk that toxic chemicals in the vicinity of Waterford 3 could pose a potential hazard to the Waterford 3 control room personnel and core damage or large early release with both trains of BRGMs and Chlorine Monitors available:

CDF = Hazard x System Failure x CCDP
CDF = 6.70E-06/yr x 0.01 x 1.0 = 6.70E-08/yr

LERF = Hazard x System Failure x CLERP
LERF = 6.70E-06/yr x 0.01 x 0.1 = 6.70E-09/yr

This risk is negligible compared to the risk from internal events, internal flooding, and fire events. Also, this risk is well below the threshold for very small risk in Reg Guide 1.174 (Region III is CDF of less than 1E-06/yr and LERF of less than 1E-07/yr).

System specific results (note – the results assume 0.01 total system failure probability for each system)

BRGM
CDF = 4.99E-08/yr
LERF= 4.99E-09/yr

Chlorine Detection
CDF = 1.71E-08/yr
LERF= 1.71E-09/yr

Sensitivity Case

The estimated risk if the system failure value used is higher (5 times higher):
CDF = 6.70E-06/yr x 0.05 x 1.0 = 3.48E-07/yr
LERF = 6.70E-06/yr x 0.05 x 0.1 = 3.48E-08/yr

Discussion and Conclusion

Note that in all of the cases provided, the risk is still negligible compared to the risk from internal events, internal flooding, and fire events, and the risk is still well below the threshold for very small risk in Reg Guide 1.174 (Region III is CDF of less than 1E-06/yr and LERF of less than 1E-07/yr).

This estimate shows the risk associated with external/offsite toxic hazards (the risk mitigated by the two systems subject to the move out of Technical Specifications) is low. The low risk values were also the result of a conservative/bounding estimate. There was no credit for early detection/ alert of the hazard and the impact on the crew was extremely limiting. Additionally, no post-accident actions or plant response was credited to help mitigate the event. A thorough and detailed evaluation of this hazard would likely result in an even lower contribution to site risk.