## 3.2 Aging Management of Engineered Safety Features Systems

This section of the SER documents the staff's review of the applicant's AMR results for the engineered safety features systems components and component groups associated with the following systems:

- emergency core cooling system
- containment spray system
- containment cooling system
- containment penetrations system
- hydrogen control system

### 3.2.1 Summary of Technical Information in the Application

In Section 3.2 of the LRA, the applicant provided the AMR results for the engineered safety features system components and component types listed in LRA Tables 2.3.2-1 through 2.3.2-5. The applicant also listed the materials, environments, aging effects requiring management, and aging management programs associated with each system.

In Table 3.2.1, "Summary of the Aging Management Programs for Engineered Safety Features Evaluated in Chapter V of NUREG-1801," of the LRA, the applicant provided a summary comparison of its AMRs with the AMRs evaluated in the GALL Report for the engineered safety features system components and component types. In Section 3.2.2.2 of the LRA, the applicant provided information concerning Table 3.2.1 components for which further evaluation is recommended by the GALL Report.

### 3.2.2 Staff Evaluation

The staff reviewed Section 3.2 of the LRA to understand the applicant's review process and to determine whether the applicant provided sufficient information to demonstrate that the effects of aging for the engineered safety features system components that are within the scope of license renewal and subject to an AMR will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

The staff performed an audit and review to confirm the applicant's claim that certain identified AMRs are consistent with the staff-approved AMRs in the GALL Report. The staff did not repeat its review of the matters described in the GALL Report. However, the staff did verify that the material presented in the LRA was applicable and that the applicant had identified the appropriate GALL AMRs. The staff's audit and review findings are summarized in Section 3.2.2.1 of this SER.

The staff also audited and reviewed those AMRs that were consistent with the GALL Report and for which further evaluation is recommended. The staff verified that the applicant's further evaluations were consistent with the acceptance criteria in Section 3.2.3.2 of NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." The staff's audit and review findings are summarized in Section 3.2.2.2 of this SER.

The staff conducted a technical review of the remaining AMRs that were not consistent with the GALL Report. The review included evaluating whether all plausible aging effects were identified and whether the aging effects listed were appropriate for the combination of materials and environments specified. The staff's review findings are documented in the Section 3.2.2.3 of this SER.

Finally, the staff reviewed the AMP summary descriptions in the FSAR Supplement to ensure that they provide an adequate description of the programs credited with managing or monitoring aging for the engineered safety features systems components and component groups.

The staff's review of the engineered safety features systems components and associated components followed one of several approaches. One approach, documented in Section 3.2.2.1, involves the staff's review of the AMR results for components in the engineered safety features systems that the applicant indicated are consistent with the GALL Report and do not require further evaluation. Another approach, documented in Section 3.2.2.2, involves the staff's review of the AMR results for components in the engineered safety features systems that the applicant indicated are consistent with the GALL Report and for which further evaluation is recommended. A third approach, documented in Section 3.2.2.3, involves the staff's review of the AMR results for components in the engineered safety features systems that the applicant indicated are not consistent with the GALL Report or are not addressed in the GALL Report. The staff's review of AMPs that are credited to manage or monitor aging effects of the steam and power conversion system components is documented in Section 3.0.3 of this SER.

*3.2.2.1 Aging Management Evaluations that are Consistent with the GALL Report, for Which No Further Evaluation is Required*

Summary of Technical Information in the Application

In Section 3.2.2.1 of the LRA, the applicant identified the materials, environments, and aging effects requiring management. The applicant identified the following programs that manage the aging effects related to the engineered safety features systems components:

- Boric Acid Corrosion Prevention Program
- Periodic Surveillance and Preventive Maintenance Program
- Water Chemistry Program
- System Walkdown Program
- Service Water Integrity Program
- Heat Exchanger Monitoring Program
- Bolting and Torquing Activities Program
- Containment Leak Rate Program
- Flow-accelerated Corrosion Program

Staff Evaluation

In Tables 3.2.2-1 through 3.2.2-5 of the LRA, the applicant provided a summary of AMRs for the engineered safety features systems and identified which AMRs it considered to be consistent with the GALL Report.

For component groups evaluated in the GALL Report for which the applicant has claimed consistency with the GALL Report, and for which the GALL Report does not recommend further evaluation, the staff performed an audit and review to determine whether the plant-specific components contained in these GALL Report component groups were bounded by the GALL Report evaluation.

The applicant provided a note for each AMR line item. The notes described how the information in the tables align with the information in the GALL Report. The staff audited those AMRs with Notes A through E, which indicated the AMR was consistent with the GALL Report.

Note A indicated that the AMR line item is consistent with the GALL Report for component, material, environment, and aging effect. In addition, the AMP is consistent with the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report and the validity of the AMR for the site-specific conditions.

Note B indicated that the AMR line item is consistent with the GALL Report for component, material, environment, and aging effect. In addition, the AMP takes some exceptions to the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report. The staff verified that the identified exceptions to the GALL AMPs had been reviewed and accepted by the staff. The staff also determined whether the AMP identified by the applicant was consistent with the AMP identified in the GALL Report and whether the AMR was valid for the site-specific conditions.

Note C indicated that the component for the AMR line item is different, but consistent with the GALL Report for material, environment, and aging effect. In addition, the AMP is consistent with the AMP identified by the GALL Report. This note indicates that the applicant was unable to find a listing of some system components in the GALL Report. However, the applicant identified a different component in the GALL Report that had the same material, environment, aging effect, and AMP as the component that was under review. The staff audited these line items to verify consistency with the GALL Report. The staff also determined whether the AMR line item of the different component was applicable to the component under review and whether the AMR was valid for the site-specific conditions.

Note D indicated that the component for the AMR line item is different, but consistent with the GALL Report for material, environment, and aging effect. In addition, the AMP takes some exceptions to the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report. The staff verified whether the AMR line item of the different component was applicable to the component under review. The staff verified whether the identified exceptions to the GALL AMPs had been reviewed and accepted by the staff. The staff also determined whether the AMP identified by the applicant was consistent with the AMP identified in the GALL Report and whether the AMR was valid for the site-specific conditions.

Note E indicated that the AMR line item is consistent with the GALL Report for material, environment, and aging effect, but a different aging management program is credited. The staff audited these line items to verify consistency with the GALL Report. The staff also determined whether the identified AMP would manage the aging effect consistent with the AMP identified by the GALL Report and whether the AMR was valid for the site-specific conditions.

The staff conducted an audit and review of the information provided in the LRA and program bases documents, which are available at the applicant's engineering office. On the basis of its audit and review, the staff finds that the AMR results, which the applicant claimed to be consistent with the GALL Report, are consistent with the AMRs in the GALL Report. Therefore, the staff finds that the applicable aging effects were identified and are appropriate for the combination of materials and environments listed.

On the basis of its audit and review, the staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

Staff RAIs Pertaining to Recent Operating Experience and Emerging Issues

Because the GALL Report and SRP-LR were issued in July 2001, these documents do not reflect the most current recommendations for managing certain aging effects that have been the subject of recent operating experience or the topic of an emerging issue. As a result, the staff issued RAIs to determine how the applicant proposed to address these items for license renewal. The applicant's responses to these RAIs, and the staff's evaluations of the responses, are documented as follows.

**< Evaluation To Be Provided by DE/EMEB >**

Conclusion

The staff has verified the applicant's claim of consistency with the GALL Report. The staff also has reviewed information pertaining to the applicant's consideration of recent operating experience and proposals for managing associated aging effects. On the basis of its review, the staff finds that the AMR results, which the applicant claimed to be consistent with the GALL Report, are consistent with the AMRs in the GALL Report. Therefore, the staff finds that the applicant has demonstrated that the effects of aging for these components will be adequately managed so that their intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3).

*3.2.2.2 Aging Management Evaluations that are Consistent with the GALL Report, for Which Further Evaluation is Recommended*

Summary of Technical Information in the Application

In Section 3.2.2.2 of the LRA, the applicant provided further evaluation of aging management as recommended by the GALL Report for engineered safety features systems. The applicant provided information concerning how it will manage the following aging effects:

- cumulative fatigue damage
- loss of material due to general corrosion
- local loss of material due to pitting and crevice corrosion
- local loss of material due to microbiologically influenced corrosion
- changes in material properties due to elastomer degradation

- local loss of material due to erosion
- buildup of deposits due to corrosion
- quality assurance for aging management of non-safety-related components

Staff Evaluation

For component groups evaluated in the GALL Report for which the applicant has claimed consistency with the GALL Report, and for which the GALL Report recommends further evaluation, the staff reviewed the applicant's evaluation to determine whether it adequately addressed the issues that were further evaluated. In addition, the staff reviewed the applicant's further evaluations against the criteria contained in Section 3.2.3.2 of the SRP-LR. Details of the staff's audit and review are documented in the staff's audit and review report.

The GALL Report indicates that further evaluation should be performed for the aging effects described in the following sections of this SER.

3.2.2.2.1 Cumulative Fatigue Damage

**<TO BE PROVIDED BY - DE >**

3.2.2.2.2 Loss of Material Due to General Corrosion

In Section 3.2.2.2.2 of the LRA, the applicant addressed loss of material due to general corrosion that could occur in the containment spray, containment isolation valves and associated piping, and the external surfaces of carbon steel components.

Section 3.2.2.2.2 of the SRP-LR states that loss of material due to general corrosion could occur in the containment spray, containment isolation valves and associated piping, and the external surfaces of carbon steel components. The GALL Report recommends further evaluation on a plant-specific basis to ensure that the aging effect is adequately managed.

The applicant stated that the containment leak rate program (AMP B.1.6) and the water chemistry control program (AMP B.1.30.3) are credited with managing the aging effect of loss of material due to general corrosion on external surfaces of carbon steel components in the containment penetrations system. The applicant also stated that there are no carbon steel components in the containment spray system and the ECCS.

The staff reviewed the primary and secondary water chemistry control program and the containment leak rate program and its evaluation of these programs is documented in Sections 3.0.3.1 and 3.0.3.3.4 of this SER, respectively. The staff concludes that the primary and secondary water chemistry control program and the containment leak rate program credited by the applicant for this line item is adequate.

In Table 3.2.1, Item Number 3.2.1-10 of the LRA, the applicant also stated that loss of material due to general corrosion on external surfaces of carbon steel components is managed by the system walkdown program (AMP B.1.28), the boric acid corrosion prevention program (AMP B.1.3), and the containment leak rate program (AMP B.1.6).

The staff reviewed the system walkdown program, the boric acid corrosion prevention program, and the containment leak rate program. The staff's evaluation of these programs is documented in Sections 3.0.3.3.9, 3.0.3.2.1 and 3.0.3.1 of this SER, respectively. The staff concludes that the system walkdown program, the boric acid corrosion prevention program, and the containment leak rate program credited by the applicant for this line item is adequate.

On the basis of its review of the water chemistry control program, the system walkdown program, the boric acid corrosion prevention program, and containment leak rate program, the staff finds that the applicant has appropriately evaluated AMR results involving management of the loss of material due to general corrosion, as recommended in the GALL Report.

**<Boric Acid Corrosion Prevention Program is reviewed by DE Staff and the above conclusion presumes this AMP to be acceptable >**

3.2.2.2.3 Local Loss of Material Due to Pitting and Crevice Corrosion

In Section 3.2.2.2.3 of the LRA, the applicant addressed local loss of material from pitting and crevice corrosion that could occur in the containment spray components, containment isolation valves and associated piping, the buried portion of the refueling water tank external surface.

Section 3.2.2.2.3 of the SRP-LR states that local loss of material from pitting and crevice corrosion could occur in the containment spray components, containment isolation valves and associated piping, and the buried portion of the refueling water tank external surface. The GALL Report recommends further evaluation to ensure that the aging effect is adequately managed.

The applicant stated that the refueling water storage tank is not buried so it is not subject to this aging mechanism. The applicant credited the containment leak rate program (AMP B.1.13) and water chemistry control program (AMP B.1.30.3) with managing the aging effect of loss of material due to pitting and crevice corrosion for the other components. The staff evaluated and accepted the primary and secondary water chemistry control program and the containment leak rate program. The staff's evaluation of these programs is documented in Sections 3.0.3.1 and 3.0.3.3.4 of this SER, respectively.

Subsection 3.2.2.2.3.2 of the SRP-LR recommends verification of the programs' effectiveness and identifies one-time inspections as an acceptable method. Both programs include periodic (rather than one-time) inspection of components, however, it does not appear that the parameters monitored or locations inspected will allow the applicant to determine the presence or extent of pitting and crevice corrosion.

By letter dated June 24, 2004, the staff asked the applicant, in RAI 3.2-11, to describe how the presence or extent of pitting and crevice corrosion will be detected for ESF systems components subject to this aging effect, and to provide the basis for assurance that periodic inspections will provide an adequate sampling. In further discussions with the applicant, the staff asked the applicant to confirm that planned activities will provide an appropriate sample for each material and environment combination, or to provide for a review to confirm that each material and environment combination subject to this aging effect has been adequately sampled prior to the period of extended operation.

In its response, the applicant provided details of ESF systems material and environment groups that credit water chemistry control programs for local loss of material due to pitting and crevice corrosion. The applicant provided information on the following material and environment combinations:

- carbon steel exposed to treated water >270 degrees F
- carbon steel exposed to treated water
- incolnel exposed to treated borated water
- stainless steel exposed to treated borated water > 270 degrees F
- stainless steel exposed to treated borated water.

Based on its review, the staff finds the applicant's response to RAI 3.2-11 acceptable, because the applicant demonstrated that AMR results involving management of the loss of material due to pitting and crevice corrosion have been appropriately evaluated, as recommended in the GALL Report. Therefore, the staff considers its concern described in RAI 3.2-11 resolved.

3.2.2.2.4 Local Loss of Material Due to Microbiologically Influenced Corrosion

In Section 3.2.2.2.4 of the LRA, the applicant addressed local loss of material due to microbiologically influenced corrosion (MIC).

Section 3.2.2.2.4 of the SRP-LR states that local loss of material due to MIC could occur in containment isolation valves and associated piping in systems that are not addressed in other chapters of the GALL Report. The GALL Report recommends further evaluation to ensure that the aging effect is adequately managed.

The applicant stated that the containment leak rate program (AMP B.1.6) and water chemistry control programs are credited with managing the aging effect of loss of material due to MIC. Both programs include periodic (rather than one-time) inspection of components, however, it does not appear that the parameters monitored will detect the presence or extent of MIC.

By letter dated June 24, 2004, the staff asked the applicant, in RAI 3.2-12, to describe how the presence or extent of MIC will be detected for piping and valve component types in the containment penetrations system (LRA Table 3.2.2-4).

In its response to RAI 3.2-12, the applicant stated that the majority of the containment penetrations system component types in LRA Table 3.2.2-4 are exposed to a treated water environment, where sulfates are low (<150 ppb). MIC is unlikely to occur in treated water systems with low sulfates. The water chemistry control program is credited to minimize the potential for MIC by maintaining the system free of contaminants. The containment leak rate program provides additional assurance that loss of material due to MIC will be managed such that the containment penetration system components will continue to perform their intended function.

In its response to RAI 3.2-12, the applicant further identified some stainless steel containment penetration system component types that are exposed to an untreated, borated water environment such as part of the quench tank, the reactor drain tank vent and drain lines, and the containment sump drain line. The applicant has verified the absence of MIC in the

containment sump by means of containment sump close-out inspections, performed every refueling outage. Since these stainless steel component types in LRA Table 3.2.2-4 drain to the containment sump, the absence of MIC in the containment sump during inspections provides evidence that these stainless steel components in LRA Table 3.2.2-4 do not have MIC.

Based on its review, the staff finds the applicant's response to RAI 3.2-12 acceptable, because the applicant demonstrated that AMR results involving management of the loss of material due to MIC have been appropriately evaluated, as recommended in the GALL Report. Therefore, the staff considers its concern described in RAI 3.2-12 resolved.

3.2.2.2.5 Changes in Material Properties Due to Elastomer Degradation

The applicant stated that this issue applies to BWRs only; therefore, it is not applicable to ANO-2 and the staff concurs.

3.2.2.2.6 Local Loss of Material Due to Erosion

In Section 3.2.2.2.6 of the LRA, the applicant addressed local loss of material due to erosion that could occur in the high pressure safety injection (HPSI) miniflow orifice.

Section 3.2.2.2.6 of the SRP-LR states that local loss of material due to erosion could occur in the HPSI pump miniflow orifice. This aging mechanism and its effect will apply only to pumps that are normally used as charging pumps in the chemical and volume control systems. The GALL Report recommends further evaluation to ensure that the aging effect is adequately managed.

The applicant stated that the chemical and volume control charging pumps are used for the reactor coolant system (RCS) makeup at ANO-2, not the HPSI pumps. There are no orifices downstream of the chemical and volume control charging pumps.

The staff finds that ANO-2 components are not subject to this aging effect.

On the basis that there are no orifices downstream of the chemical and volume control charging pumps used for RCS makeup, the staff finds that this aging effect is not applicable to ANO-2.

3.2.2.2.7 Buildup of Deposits Due to Corrosion

The applicant stated that this issue applies to BWRs only; therefore, it is not applicable to ANO-2 and the staff concurs.

3.2.2.2.8 Quality Assurance for Aging Management of Non-Safety-Related Components

**< Evaluation To Be Provided by DIPM >**

Conclusion

On the basis of its review, for component groups evaluated in the GALL Report for which the applicant has claimed consistency with the GALL Report, and for which the GALL Report

recommends further evaluation, the staff determines that the applicant adequately addressed the issues that were further evaluated. In addition, the staff reviewed the applicant's further evaluations against the criteria contained in the SRP-LR. Since the applicant's AMR results are otherwise consistent with the GALL Report, the staff finds that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

*3.2.2.3 AMR Results that are Not Consistent with the GALL Report or Not Addressed in the GALL Report*

Summary of Technical Information in the Application

In Tables 3.2.2-1 through 3.2.2-5 of the LRA, the staff reviewed additional details of the results of the AMRs for material, environment, aging effect requiring management, and AMP combinations that are not consistent with the GALL Report.

In Tables 3.2.2-1 through 3.2.2-5, the applicant indicated, via Note F through J, that neither the identified component nor the material and environment combination is evaluated in the GALL Report and provided information concerning how the aging effect will be managed.

Note F indicated that the material is not in the GALL Report for the identified component.

Note G indicated that the environment is not in the GALL Report for the identified component and material.

Note H indicated that the aging effect is not in the GALL Report for component, material, and environment combination.

Note I indicated that the aging effect in the GALL Report for the identified component, material, and environment combination is not applicable

Note J indicated that neither the identified component nor the material and environment combination is evaluated in the GALL Report.

Staff Evaluation

For component type, material and environment combination that are not evaluated in the GALL Report, the staff reviewed the applicant's evaluation to determine whether the applicant had demonstrated that the effects of aging will be adequately managed so that the intended function will be maintained consistent with the CLB during the period of extended operation.

The staff evaluation is discussed below.

3.2.2.3.1 Emergency Core Cooling System Summary of Aging Management - Table 3.2.2-1

The staff reviewed Table 3.2.2-1 of the LRA, which summarized the results of AMR evaluations in the SRP-LR for the emergency core cooling system components groups.

For both fouling and loss of material, the applicant identified aging management of the bearing housing component type as consistent with the GALL Report material, environment, and aging effect. Instead of carbon or stainless steel, the component is made of cast iron. The staff considers that the aging effects for cast iron are the same as for carbon steel. On this basis, the staff finds this acceptable.

The applicant stated that no aging effect is identified for stainless steel components exposed to air, including bolting, orifice, heat exchanger shell, piping, pump casing, thermowell, tubing, and valve component types. No aging effect is identified for stainless steel valves exposed to nitrogen. Air is not identified in the GALL Report as an environment for these components and materials. No aging effects are considered to be applicable to stainless steel components in air/gas, containment air, indoor air (not-air-conditioned), and outdoor environments. On the basis of the conclusion that no aging effects requiring management are identified, the staff finds that the absence of an aging management program for stainless steel components exposed to air or nitrogen gas is acceptable.

No aging effect is identified for Alloy 182 nozzles exposed to air. Alloy 182 is not associated with this component in the GALL Report, and the staff does not consider any aging effects for this combination. On that basis, the staff finds this acceptable.

The applicant proposed to manage loss of material and cracking of stainless steel heat exchanger tubes, orifice, piping, pump casing, tubing, and valve component types exposed to treated, borated water using only the water chemistry control program (AMP B.1.30.3).

The staff evaluated the primary and secondary water chemistry control program and documented its evaluation in Section 3.0.3.1 of this SER. The staff finds that because the effects of pitting and crevice corrosion on stainless steel components are not significant in chemically treated borated water, inspection of selected components to verify the absence of loss of material is not required. On the basis of its review of this aging effect, and its review of the water chemistry control program consistent with the GALL Report which is credited to manage this aging effect, the staff finds this acceptable.

**<Additional Evaluation To Be Provided by DE/EMCB >**

3.2.2.3.2 Containment Spray System Summary of Aging Management - Table 3.2.2-2

The staff reviewed Table 3.2.2-2 of the LRA, which summarized the results of AMR evaluations in the SRP-LR for the containment spray system components group.

The applicant stated that no aging effect is identified for stainless steel components exposed to air, including bolting, filter housing, heat exchanger tube sheet, nozzle, orifice, piping, tank, thermowell, tubing, and valve component types. Air is not identified in the GALL Report as an environment for these components and materials. The staff finds that no aging effects are applicable, and on that basis the staff finds that the absence of an aging management program for stainless steel components exposed to air is acceptable.

The applicant proposed to manage loss of material and cracking of stainless steel filter housing, nozzle, orifice, piping, pump casing, tank, thermowell, tubing, and valve component types

exposed to treated, borated water using only the water chemistry control program (AMP B.1.30.3).

The staff evaluated the primary and secondary water chemistry control and documented its evaluation in Section 3.0.3.1 of this SER. The staff finds that because the effects of pitting and crevice corrosion on stainless steel components are not significant in chemically treated borated water, inspection of selected components to verify the absence of loss of material is not required. On the basis of its review of this aging effect, and its review of the water chemistry control program consistent with the GALL Report which is credited to manage this aging effect, the staff finds this acceptable.

During the audit, the applicant was asked to provide the technical basis for managing aging effects of heat exchanger tubes differently for ferritic stainless steel as opposed to ordinary stainless steel. The applicant responded that ferritic stainless steel had been identified as a unique material because it will require special inspection techniques as part of the heat exchanger monitoring program. The ferritic stainless steel is exposed to high-temperature treated borated water while the regular stainless steel tube material is exposed to a similar fluid at a lower temperature. On the basis that cracking is not identified as an aging effect at the temperature to which this component is subjected, the staff finds the absence of a program to manage this aging effect to be acceptable.

The staff noted that the refueling water tank heater housing was incorrectly matched to an item in Table 3.2.1. On March 24, 2004, the applicant submitted a correction to this table entry.

**<Additional Evaluation To Be Provided by DE/EMCB >**

3.2.2.3 Containment Cooling System Summary of Aging Management - Table 3.2.2-3

The staff reviewed Table 3.2.2-3 of the LRA, which summarized the results of AMR evaluations in the SRP-LR for the containment cooling system components groups.

The applicant stated that no aging effect is identified for stainless steel bolting and piping exposed to air. Air is not identified in the GALL Report as an environment for these components and materials. The staff considers that no aging effects are applicable to stainless steel components in air, containment air, indoor air (not air-conditioned), and outdoor environments. On that basis, the staff finds that the absence of an AMP for stainless steel components exposed to air is acceptable.

**<Additional Evaluation To Be Provided by DE/EMCB >**

3.2.2.3.4 Containment Penetrations System Summary of Aging Management - Table 3.2.2-4

The staff reviewed Table 3.2.2-4 of the LRA, which summarized the results of AMR evaluations for the containment penetrations system components group.

The applicant stated that no aging effect is identified for stainless steel piping, tubing, and valves exposed to air, or for stainless steel valves exposed to nitrogen. Air is not identified in the GALL Report as an environment for these components and materials. No aging effects are

considered to be applicable to stainless steel components in air/gas, containment air, indoor air (not-air-conditioned), and outdoor environments. On that basis, the staff finds that the absence of an AMP for stainless steel components exposed to air is acceptable.

**<Additional Evaluation To Be Provided by DE/EMCB >**

3.2.2.3.5 Hydrogen Control System Summary of Aging Management - Table 3.2.2-5

The staff reviewed Table 3.2.2-5 of the LRA, which summarized the results of the AMR evaluations in the SRP-LR for the hydrogen control system components group.

The applicant stated that no aging effect is identified for stainless steel components exposed to air, including bolting, filter housing, orifice, piping, pump casing, tubing, and valve component types. Air is not identified in the GALL Report as an environment for these components and materials. No aging effects are considered to be applicable to stainless steel components in air, containment air, indoor air (not air-conditioned), and outdoor environments. On that basis, the staff finds that the absence of an aging management program for stainless steel components exposed to air is acceptable.

**<Additional Evaluation To Be Provided by DE/EMCB >**

Conclusion

On the basis of its review, the staff finds that the applicant appropriately evaluated AMR results involving material, environment, aging effect requiring management, and AMP combinations that are not evaluated in the GALL Report. The staff finds that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

### 3.2.3 Conclusion

The staff concluded that the applicant provided sufficient information to demonstrate that the effects of aging for the engineered safety features systems components and component groups that are within the scope of license renewal and subject to an AMR will be adequately managed so that the intended functions will be maintained consistent with the current license CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).