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SUBJECT: Monthly operating repts for Apr 1998 for Susquehanna Steam Electric Station,Units 1 & 2.W/980518 ltr.

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May 18, 1998

U. S. Nuclear Regulatory Commission
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SUSQUEHANNA STEAM ELECTRIC STATION
MONTHLY OPERATING REPORTS Docket Nos. 50-387/NPF-14
and 50-388/NPF-22
PLA - 0004909 FILE: R41-2A

The April 1998 monthly operating reports for Susquehanna SES Units 1 and 2 are attached. The format and contents of the report have been changed to comply with the guidance in G. L. 97-02.

Very truly yours,

G. J. Kuczynski

/cmm

cc: NRC Region 1
Mr. K. Jenison, NRC Sr. Resident Inspector
Mr V. Nerses, NRC Sr. Project Manager

1/1
IE24

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OPERATING DATA REPORT

DOCKET NO. 50-387
UNIT One
DATE 5/7/98
COMPLETED BY K. A. Young
TELEPHONE (717) 542-3251

OPERATING STATUS

1. Unit Name: Susquehanna Steam Electric Station (U1)
2. Reporting Period: April 1998
3. Design Electrical Rating (Net MWe): 1100
4. Maximum Dependable Capacity (Net MWe): 1090

		This Month	Yr.-to-Date	Cumulative
5.	Hours in Reporting Period	719	2879	130,584
6.	Number of Hours Reactor Was Critical	316.5	2476.5	104,854.3
7.	Hours Generator On-Line	316.0	2,476	103,069.1
8.	Unit Reserve Shutdown Hours	0	0	0
9.	Net Electrical Energy Generated (MWH)	324,029	2,720,890	103,961,705

NOTES:

UNIT SHUTDOWNS

DOCKET NO. 50-387
UNIT One
DATE 5/7/98
COMPLETED BY K. A. Young
TELEPHONE (717) 542-3251

REPORT MONTH April 1998

No.	Date	Type[1]	Duration (Hours)	Reason[2]	Method of Shutting Down Reactor[3]	Cause & Corrective Action to Prevent Recurrence
1	4-14-98	S	403	C	2	Shutdown to commenced 10th Refuel Inspection Outage.

Summary:

Unit shutdown as scheduled to commence 10th Refuel Inspection Outage. Duration scheduled for 38 days.

1.
F. Forced
S. Scheduled

2.
Reason:
A - Equipment Failure (Explain)
B - Maintenance or Test
C - Refueling
D - Regulatory Restriction
E - Operator Training & Licensee Exam
F - Administrative
G - Operational Error (Explain)

3.
Method:
1 - Manual
2 - Manual Scram
3 - Automatic Scram
4 - Continuation from previous
5 - Other

SUSQUEHANNA STEAM ELECTRIC STATION

Docket Number: 50-387 Date: 5/7/98

Completed by: K.A. Young Telephone: (717) 542-3251

Challenges to Main Steam Safety Relief Valves

None.

Changes to the Offsite Dose Calculation Manual

None.

Major Changes to Radioactive Waste Treatment System

Safety Evaluation NL- 98-028 Rev. 0, Vacuum Degassifier Inoperable.

Safety Evaluation NL-98-004 Rev. 0, Current Licensing Basis Update for Radioactive Liquid Waste System Leak or Failure (Release to Atmosphere) - FSAR 15.7.3.

Safety Evaluation NL-97-094 Rev. 0, CLB Update for Radioactive Releases due to Liquid Containing Tank Failures.

OPERATING DATA REPORT

DOCKET NO. 50-388
UNIT Two
DATE 5/7/98
COMPLETED BY K. A. Young
TELEPHONE (717) 542-3251

OPERATING STATUS

1. Unit Name: Susquehanna Steam Electric Station (U2)
2. Reporting Period: April 1998
3. Design Electrical Rating (Net MWe): 1100
4. Maximum Dependable Capacity (Net MWe): 1094

		This Month	Yr.-to-Date	Cumulative
5.	Hours in Reporting Period	719	2879	115,823
6.	Number of Hours Reactor Was Critical	550.2	2710.2	98,346.5
7.	Hours Generator On-Line	528.1	2688.1	96,730.5
8.	Unit Reserve Shutdown Hours	0	0	0
9.	Net Electrical Energy Generated (MWH)	557,271	2,934,393	99,379,457

NOTES:

UNIT SHUTDOWNS

DOCKET NO. 50-388
UNIT Two
DATE 5/7/98
COMPLETED BY K. A. Young
TELEPHONE (717) 542-3251

REPORT MONTH April 1998

No.	Date	Type[1]	Duration (Hours)	Reason[2]	Method of Shutting Down Reactor[3]	Cause & Corrective Action to Prevent Recurrence
1	4-4-98	F	190.9	A	2	Shutdown for repairs of a stator cooling leak on the main generator neutral bushing and to perform instrumentation local leak rate testing.

The Unit shutdown for a forced outage to repair a stator cooling leak on the main generator neutral bushing. Unit returned to service at 0410 hours April 12th.

1.
F. Forced
S. Scheduled

2.
Reason:
A - Equipment Failure (Explain)
B - Maintenance or Test
C - Refueling
D - Regulatory Restriction
E - Operator Training & Licensee Exam
F - Administrative
G - Operational Error (Explain)

3.
Method:
1 - Manual
2 - Manual Scram
3 - Automatic Scram
4 - Continuation from previous
5 - Other

SUSQUEHANNA STEAM ELECTRIC STATION

Docket Number: 50-388 Date: 5/7/98

Completed by: K. A. Young Telephone: (717) 542-3251

Challenges to Main Steam Safety Relief Valves

None.

Changes to the Offsite Dose Calculation Manual

None.

Major Changes to Radioactive Waste Treatment System

(See Docket 50-387 and Attachments)

SAFETY EVALUATION SUMMARY

Title: VACUUM DEGASIFIER AND ASSOCIATED VENTILATION INOPERABLE

No. NL-98-028

Description of Change: For Units 1 and 2, (1) allow the vacuum degasifier to be placed in service for testing, troubleshooting and monitoring with the exhaust filter inoperable; and (2) suspend operation of the vacuum degasifier to control oxygen in condensate until approximately two week prior to the start of the Unit 2 Ninth Refueling and Inspection Outage.

SUMMARY

The changes as described above can be implemented without affecting safe station operation or compromising the health and safety of the public.

A. The FSAR was reviewed to identify sections related to the vacuum degasifier. The degasifier is discussed relative to deaerating condensate for the Condensate and Refueling Water Storage Tanks in Section 9.2.10.2. The degasifier and its ventilation filter system are mentioned in Sections 9.4.3.1 and 9.4.3.2, which are concerned with radwaste building HVAC. The Safety Evaluation Report, NUREG 0776 and its Supplements, were reviewed. There was no specific reference to the vacuum degasifier, although reference is made to further provisions taken by Susquehanna to reduce the potential for IGSCC. Failure to operate the vacuum degasifier for oxygen control does not appreciably increase the probability of failure due to IGSCC. The vacuum degasifier is not used to mitigate the consequences of any design basis accident. FSAR Section 15.7, Radioactive Releases from a System or Component, was reviewed. The vacuum degasifier and its exhaust filter system are not evaluated. The vacuum degasifier exhaust filter system is only used to reduce particulate and iodine activity in gases extracted from condensate by the vacuum degasifier. Since the vacuum degasifier is not used to mitigate the consequences of any design basis accident, neither is its exhaust filter system. Therefore, the proposed actions do not increase the probability of occurrence of the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the FSAR.

B. The vacuum degasifier system performs no safety functions. The degasifier exhaust filter skid is not used to mitigate the consequences of an accident. The vacuum degasifier will be operated under administrative controls without the exhaust filter for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5. Therefore, there is no possibility of an accident or malfunction of a different type than any evaluated in the SAR.

C. Technical Specification 3.11.2.5, "Ventilation Exhaust Treatment System," and its BASES were reviewed as applicable to the proposed change. These sections require that the appropriate portions of the ventilation exhaust treatment system be operable and be used as appropriate to reduce radioactive materials in gaseous waste prior to discharge. The intent is to assure that releases are ALARA. The vacuum degasifier exhaust filter system is a ventilation exhaust treatment system that is governed by the Technical Specification. The vacuum degasifier without an operable exhaust filter will be operated under administrative controls and within the bounds of the Technical Specification Action Statements for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5. Therefore, the proposed actions do not reduce the margin of safety as defined in the BASES.

SAFETY EVALUATION COVERSHEET

Title: VACUUM DEGASIFIER INOPERABLE

No. NL-98-028

UNIT # 0	
DCP # N/A	
PROCEDURE #	
OTHER (ECO#, SPC#, By-Pass, RIE) CR 97-3285	

SUSQUEHANNA STEAM ELECTRIC STATION
PENNSYLVANIA POWER & LIGHT COMPANY

REV.	PREPARED BY/ DATE	REVIEWED BY/ DATE	APPROVED BY*/ DATE	PORC MTG #/ DATE
0	4/27/98	4/28/98	4/24/98	98-04-09 4/9/98

* This signature of the Responsible Supervisor indicates approval of the safety evaluation and confirms that interfaces with other disciplines, functional groups, etc. have been considered and have been incorporated into the evaluation as necessary. The Responsible Supervisor must be designated on Form NDAP-QA-0726-3.

A copy of the ACCEPTED Safety Evaluation must be forwarded to the Supervisor - Nuclear Licensing.

SAFETY EVALUATION #

Title: VACUUM DEGASIFIER INOPERABLE

I. System/Procedure/Experiment Identification. (Name and Number)

System 37E, Condensate & Refueling Water Oxygen Control (Primary Coolant Degasifier System, PID M136)
System 65G, Reactor Building Chilled Water (Primary Coolant Degasifier Exhaust Filter System, PID M179-2)
Susquehanna Chemistry Manual, Chapter 3, Tables 3-5, 3-6, 3-7: Oxygen limits for CRD, CST and RWST
Chemistry SSAC Matrix: CH-037-001 RWST, CH-037-004 CST, CH-055-001 CRD: Oxygen limits
SSES CTS 3.11.2.5 Radioactive Effluents, Ventilation Exhaust Treatment System, LCO and Surveillances

II. Description and Implications of Proposed Action.

A. Fully describe the action and its purpose.

There are two actions, as follows.

1. The Primary Coolant Vacuum Degasifier System may be placed in service, as required, in support of system testing, troubleshooting and monitoring with the exhaust filter inoperable.

2. The vacuum degasifier will not be operated to reduce dissolved oxygen in condensate as specified by the Susquehanna Chemistry Program for up to sixteen months (i.e., from November 1997 until approximately two weeks prior to the start of the Unit 2 ninth RIO).

The purpose of these actions is to assess the problems with the exhaust filter system that were identified in CR 97-3285, and to develop and implement appropriate corrective actions.

The Condensate and Refueling Water Oxygen Control system consists of a vacuum degasifier skid and exhaust filter system. The vacuum degasifier strips dissolved gases from condensate, reducing oxygen to <50 ppb. The stripped gases (primarily nitrogen and oxygen from air) are passed through activated carbon and HEPA filters to remove any iodine and particulate activity prior to discharge to the turbine building vent. The degasifier exhaust filter system has been corroded by moisture, which has also contaminated the filters. Condition Report CR 97-3285 documents that exhaust filters have not been properly maintained and adequately tested, and therefore cannot be relied upon to remove any iodine or particulate activity that may be present in the discharge. This evaluation addresses the safety, regulatory and plant corrosion aspects of the vacuum degasifier being unavailable for oxygen control through the Unit 1 1998 refueling outage. It also addresses operation of the vacuum degasifier for testing purposes with the exhaust filter system inoperable.

Primary Coolant Degasifier Exhaust Filter System

The primary coolant degasifier exhaust filter system is designed to remove particulate activity and volatile iodine activity that may be stripped from condensate along with non-condensible gases in the vacuum

degasifier column. This system is described in FSAR 9.4.3.2 as part of the radwaste building ventilation treatment system, and is part of the ventilation exhaust treatment system as described in TS 3.11.2.5. If the degasifier exhaust filter system is not operated, there is a potential for particulate and iodine activity release to the turbine building exhaust vent downstream of the vent filter units. Any release to the environment would be monitored by the turbine building vent activity monitoring system (SPING).

Primary Coolant Degasifier System

The design objective of the vacuum degasifier was to maintain oxygen concentrations in reactor water below 250 ppb during plant shutdown periods. Oxygen control was described as an element of PP&L's IGSCC mitigation strategy in an internal engineering report that was transmitted to the NRC in PLA-291, 9/25/78. This transmittal provided PP&L's position on mitigating IGSCC of piping welds at Susquehanna. Plant design changes that were made to control oxygen included (1) shifting the suction of the CRD pumps to the condensate polisher reject line and (2) installing a mechanical vacuum deaerator to control oxygen during all modes of plant operation. In testimony before the Atomic Safety and Licensing Board in 1981, PP&L stated that the mechanical vacuum deaerator would be used to maintain <250 ppb oxygen in reactor water during startup, hot standby and shutdown. The NRC's Safety Evaluation Report, NUREG 0776, Supplement 2, paragraph 5.2.3.2 generally recognized dissolved oxygen control as one of the provisions taken by PP&L to reduce the potential for IGSCC.

The technical basis for using a vacuum deaerator to control oxygen during non-operating periods was provided in GE SIL 136, AID WPF 3-77 "Oxygen Control in BWR Systems during Shutdown, Layup and Transient Conditions," March 1977, and NEDO 23631 "BWR Coolant Oxygen Control," June 1977. The benefits claimed included:

- reduced stress corrosion cracking of stainless steels, low alloy steel and inconel;
- reduced pitting and corrosion fatigue of carbon and low alloy steels;
- reduced crevice corrosion of stainless steels and inconel;
- reduced general corrosion of all materials;
- reduced corrosion during chemistry transients (chloride or resin intrusions);
- increased margin against, and reduced probability of, component failures due to corrosion;
- improved reactor water clarity (less of a crud burst on flood-up);
- reduced primary system radiation buildup and airborne activity during refueling.

GE made four recommendations to achieve these objectives:

1. Maintain low oxygen (0.2 to 0.3 ppm) in the RPV, recirculation system, RWCU and RHR-SDC systems during shutdown and refueling.

2. This would require feed and bleed flow paths from the CST, through the vacuum degasifier to the CRD system and the recirculation system via the condensate fill, keepfill or purge connections to RHR. With the head on, water would be let down from RWCU to the condenser and/or liquid radwaste to complete the flow path. With the cavity flooded, excess water would be let down from the fuel pool cooling and cleanup system to the CST.

3. Continuously flush the ECCS injection lines from the injection valves into the RPV with deaerated water during shutdown and refueling, to prevent the buildup or entrapment of oxygen in these dead legs from radiolysis or other sources.

4. This would require a temporary jumper from the condensate keepfill line to a test connection downstream of the closed injection valves. Condensate would be from the CST via the vacuum degasifier and would thus be deaerated.

5. Provide a supply of deaerated water to the CRD system during plant shutdown and refueling.

6. Layup the RHR and other ECCS systems between the injection valves and the pump discharge check valves with deaerated water. This would require filling or purging this piping with deaerated condensate after flow testing or use for normal operation, as well as periodic sampling and flushing to maintain low oxygen levels.

These recommendations were evaluated for implementation at Susquehanna during the mid-1980's, and many were determined to be impractical or not feasible. The current use of the vacuum degasifier is described in Susquehanna Chemistry Manual Chapter 3, Section 3.2.5.3, and Chapter 4, Rev. 2, Section 4A.3. The vacuum degasifier is used for the following purposes:

1. Deaerating the Refueling Water Storage Tank prior to cavity floodup during a refueling outage. This is intended to reduce the chemical shock to fuel crud deposits from bringing in highly oxygenated water during cavity floodup. It also supports the original design objective of maintaining low oxygen in the vessel and connected systems during flood-up. The vacuum degasifier is aligned to the RWST and operated for two weeks prior to a refueling outage to reduce oxygen in the RWST to <1000 ppb.

2. Providing deaerated condensate to the CRD system during a refueling outage. This is intended to minimize crevice corrosion and corrosion of specialty metals in the CRD's. It also helps to maintain low oxygen in the lower vessel head.

3. Deaerating condensate used for keep-fill, filling and flushing of carbon steel ECCS systems. This is only required when condensate transfer is aligned to the CST of a unit that is shutdown with condenser vacuum broken. This is intended to minimize corrosion of carbon steels piping and components in these systems. When condensate transfer is aligned to an operating unit, the main condenser accomplishes the same function of deaeration and in addition the water is purified by the condensate polishers.

4. Deaerating the Condensate Storage Tank of a unit shutdown with condenser vacuum broken. This is intended to minimize corrosion of the attached carbon steel condensate piping by reducing the oxygen concentration.

Except to deaerate the RWST over the two weeks prior to a refueling or planned outage where the cavity will be flooded, there is no need to operate the vacuum degasifier when both units are operating at power. Each unit's CRD system is supplied deaerated, purified condensate from the polisher reject line, and each unit's CST is partially deaerated by the reject flow. Condensate transfer takes reject and/or CST water from the unit to which the pump suctions are aligned. Therefore, systems using condensate transfer receive either fully or partially deaerated condensate based on reject flow rates.

B. Identify all the components that will be affected.

1. Primary Coolant Degasifier System.

2. Primary Coolant Degasifier Exhaust Filter System.

3. Refueling Water Storage Tank, failure to achieve specified oxygen concentrations prior to flooding the reactor cavity during the Unit 1-10 RIO;

4. Unit 1 Condensate Storage Tank, failure to maintain specified oxygen concentrations during the Unit 1-10 RIO;

5. Unit 1 Control Rod Drive system, failure to maintain specified oxygen concentrations during the Unit 1-10 RIO;

6. Unit 1 or 2, failure to maintain specified oxygen concentrations in the Condensate Storage Tank and the Control Rod Drive System during a forced outage with condenser vacuum broken;

7. Systems and components receiving condensate transfer water when condensate transfer is aligned to the Condensate Storage Tank of a unit shutdown with vacuum broken, resulting in elevated oxygen concentration in condensate transfer water. For carbon steel systems and components, corrosion will be increased in proportion to the increased concentration of oxygen. Condensate Transfer supplies the ECCS (i.e., HPCI, RHR, Core Spray) and RCIC pump discharge keepfill system and serves as the supply source for the RWCU Pump Purge Water System.

C. List Safety Functions of affected components.

1. The primary coolant degasifier exhaust filter system absorbs particulate and iodine activity that may be present in gases extracted from condensate by the primary coolant degasifier system, and thus is part of the plant design to minimize activity releases and offsite dose.

2. The primary coolant degasifier system performs no safety functions.

3. The Refueling Water Storage Tank provides a backup source of injection water for HPCI and RCIC.

4. The Condensate Storage Tank provide a minimum inventory of injection water for HPCI and RCIC.

5. The Control Rod Drive Hydraulic System upstream of the hydraulic control units (HCUs) is non-quality and performs no safety functions. The HCUs, the insert and withdraw lines and the scram discharge volume provide the capability to rapidly insert control rods in the event of a manual our automatically initiated demand to shut down the reactor.

6. The ECCS and RCIC systems are safety related and provide injection and cooling water under various accident conditions.

7. The RWCU Pump Purge Water System performs no safety functions.

D. Describe potential effects on Safety Functions.

1. If the primary coolant degasifier exhaust filter system is not operated, particulate and iodine activity that may be stripped from condensate along with non-condensibles in the vacuum tower would be discharged to the turbine building exhaust vent without processing. This activity would be discharged to the environment. The discharge would be monitored by the turbine building vent activity sampling system (SPING). The potential to discharge activity by this path is considered to be minimal for the following reasons.

   - The current rate of fission product release from the fuel is very low, as indicated by the offgas pretreatment radiation monitor. Furthermore, moisture carryover (which provides the mechanism for particulate activity transport) has traditionally been very low. Therefore, contamination of condensate with particulate and iodine activity is very low.

- The vacuum degasifier processes condensate after it has been processed through the condensate polishers. The polishers are expected to remove >90% of the iodine activity and >50% of the particulate activity that may be present in condensate.

- Any particulate and iodine activity that may be present in polished condensate would tend to stay in the liquid phase in the vacuum degasifier column. Typically, <1% of iodine that enters the main condenser is released to the condenser offgas. Entrained moisture drops may transport iodine and particulate activity out of the vacuum tower with the non-condensible gas stream. However, the non-condensible gas flow rate leaving the vacuum tower is extremely low. Large quantities of entrained liquid drops are not expected. Assuming a processing rate of 1000 gpm of air-saturated water at 55°F, the non-condensible discharge rate is < 3 SCFM.

Given the current condition of the nuclear fuel and the expected low level of activity in polished condensate, operation of the vacuum degasifier in support of system testing, troubleshooting and monitoring with the exhaust filter inoperable is not expected to increase plant activity discharges. In particular, it is not expected to produces offsite doses that would exceed the limits of TS 3.11.2.5 and therefore require operation of the degasifier filter system. Administrative controls will be put into place to shutdown the vacuum degasifier, if operating, in the event that offgas noble gas release rate increases by more than 50%. The degasifier would not be placed back into service until the impact of this increase on potential offsite doses due to degasifier operation had been evaluated. Offgas release rate is monitored continuously under Technical Specification 3.11.2.7.

2. An 80-10 System and Effluent Pathway Evaluation was conducted relative to reducing operation of the vacuum degasifier for ~16 months, and for operating it for testing purposes without the exhaust filter system in service. Reducing the operation of the vacuum degasifier does not create a new release pathway to the environment, but rather minimizes a potential release pathway via the degasifier exhaust. As discussed in Item 1 above, operation of the vacuum degasifier without its exhaust filter system, with administrative controls based on offgas activity release rates, is not expected to increase plant discharges. These changes do not affect system status (radioactive versus non-radioactive), do not change physical or administrative barriers between a radioactive system and a release point, or change barriers between non-radioactive and radioactive systems. Therefore, these changes, with the controls described above, have no impact on routine radioactive effluents.

3. Since the primary coolant degasifier system performs no safety functions, taking it out of service for oxygen control has no effect on safety functions.

4. Failure to minimize oxygen in the Refueling Water Storage Tank has no effect on safety functions. The availability of water in the tank to provide a backup supply to the water in the condensate storage tanks is not affected by the presence or absence of dissolved oxygen in the water. The tank is air vented and designed for air-saturated condensate, so that failure to reduce oxygen will not result in an increase in corrosion beyond that considered in design.

5. Failure to minimize oxygen in the Condensate Storage Tanks has no effect on safety functions for the same reasons as for the Refueling Water Storage Tanks.

6. Failure to minimize oxygen in the control rod drive water due to taking the vacuum degasifier out of service may result in increased crevice corrosion of internal components of the control rod drives. However, the rate of corrosion is a strong function of temperature, and the vacuum degasifier is only used for CRD oxygen control during shutdown periods, when temperatures are low. Current industry guidelines (EPRI TR-103515-R1, BWR Water Chemistry Guidelines - 1996 Revision) recommend controlling oxygen during all "hot" operations. Therefore, it is concluded that the failure to operate the vacuum degasifier to control oxygen in the CRD systems during an outage will not result in significant corrosion of the drives over the relatively short period of a plant shutdown or refueling outage. This

change will not alter any chemistry parameter such that the station is being operated outside the recommended limits in the EPRI BWR Water Chemistry Guidelines - 1996 revision.

7. Failure to minimize oxygen in the condensate transfer water used to supply the ECCS and RCIC pump discharge piping keepfill system will result in additional corrosion of carbon steel components and piping in these systems. The Susquehanna Chemistry Manual recommends that deaerated water be supplied to these loads for long-term corrosion minimization and to minimize the generation of corrosion products that would be injected into the RPV from these systems. The vacuum degasifier is only used to minimize oxygen in condensate transfer during outages when the condenser vacuum is broken and condensate transfer is aligned to the shutdown unit. Therefore, the additional corrosion that may occur in the ECCS and RCIC systems as a consequence of not operating the degasifier during the upcoming U1-10RIO and any other forced outages over the next ~16 months is not expected to be significant.

8. Failure to use partially deaerated water from the Refueling Water Storage Tank to flood the cavity for refueling during the U1-10RIO may result in additional crud release from the fuel, clouding of the cavity water and increased radiation levels off the pool surface, until the cleanup systems restore pool clarity. These effects may delay refueling activities or result in increased personnel dose, but have no effect on safety functions.

9. The proposed change has no effect on the Emergency Plan. The vacuum degasifier skid does not provide a safety function, but is used to provide oxygen control as previously described during plant shutdowns in which main condenser vacuum is broken, refueling outages and if required during normal plant operation. The vacuum degasifier exhaust filter does not provide a safety function, but is used to minimize activity release resulting from the exhaust flow from the vacuum degasifier. Since the degasifier will not be operated for oxygen control, any releases due to this activity will be eliminated. As discussed in Item 1 above, operation of the vacuum degasifier without its exhaust filter system, with administrative controls based on offgas activity release rates, is not expected to increase plant discharges.

10. The proposed change has been evaluated for impacts on the Quality Assurance Program. There are none.

11. The proposed change does not change the design of the plant, change its operation in a matter that would increase activity releases, or affect the probability or consequences of any design basis accident and therefore has no effect on the Design Assessment Report. As discussed in Item 1 above, operation of the vacuum degasifier for testing purposes, without its exhaust filter system, is not expected to increase plant discharges.

12. The proposed changes make no changes to plant equipment, other than to not operate the degasifier for oxygen control and to operate it for testing purposes without its exhaust filter skid for a limited period of time. Therefore these changes would have no effect on the Fire Protection Review Report.

13. The proposed change has no effect on the Security Plan.

14. The proposed change has no effect on the Offsite Dose Calculation Manual. There is no change to activity release points or to monitoring requirements. Taking the degasifier out of service eliminates the need to operate its exhaust filter skid. Therefore, there is no potential to violate appropriate treatment requirements for ventilation exhaust.

15. The vacuum degasifier and its exhaust filter system are not safety features listed in Chapter 6 of the FSAR.

16. The proposed change will affect the Susquehanna Chemistry Program by causing chemistry specifications for oxygen in the refueling water storage tank, condensate storage tank and control rod drive system to be violated during periods when the vacuum degasifier must be operated to provide oxygen control. Change Notices have been processed to suspend the oxygen requirements during periods when vacuum degasifier operation would be needed to meet them.

III Does the proposed action increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the SAR? (Include specific reference to FSAR sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The vacuum degasifier is not used to mitigate the consequences of any design basis accident in the Safety Evaluation Report, and therefore reducing the operation of the degasifier does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety.

The vacuum degasifier exhaust filter system is only used to reduce particulate and iodine activity in gases extracted from condensate by the vacuum degasifier. Since the vacuum degasifier is not used to mitigate the consequences of any design basis accident, neither is its exhaust filter system. Section 15.7 of the FSAR, Radioactive Releases from a System or Component, was reviewed. The vacuum degasifier exhaust filter system is not evaluated. Administrative controls will be put in place to operate the vacuum degasifier without the exhaust filter system for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5.

IV Does the proposed action create a possibility for an accident or malfunction of a different type than any evaluated previously in the SAR? (Include reference to specific FSAR sections applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

Section 15.7 of the FSAR, Radioactive Releases from a System or Component, was reviewed. Since the vacuum degasifier and its exhaust filter skid are not evaluated in Section 15.7, and since the equipment is not used to mitigate the consequences of an accident, there is no possibility of an accident or malfunction of a different type than any evaluated in the SAR. The vacuum degasifier will be operated under administrative controls without the exhaust filter for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5.

V Does the proposed action reduce the margin of safety as defined in the basis for any Technical Specification? (Include reference to specific Technical Specification sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

Technical Specification 3.11.2.5, "Ventilation Exhaust Treatment System," was reviewed as applicable to the proposed change. This section requires that the appropriate portions of the ventilation exhaust treatment system shall be operable and shall be used as appropriate to reduce radioactive materials in gaseous waste prior to discharge. The vacuum degasifier exhaust filter system is a ventilation exhaust treatment system that is governed by the Technical Specification. The vacuum degasifier will be operated under administrative controls without the exhaust filter for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5.

VI Does the proposed action involve a change in a Technical Specification?

YES ☐ NO ☒

If "YES", NDAP-QA-0731 "Technical Specification Changes" applies. A "YES" answer does not preclude activity up to a point just before it would physically affect the functioning of the plant.

Provide a discussion of the basis and criteria used in arriving at the above conclusion. If appropriate, describe the extent of activity and why it should be allowed to proceed prior to the Technical Specification change.

Technical Specification 3.11.2.5, "Ventilation Exhaust Treatment System," was reviewed as applicable to the proposed change. This section requires that the appropriate portions of the ventilation exhaust treatment system shall be operable and shall be used as appropriate to reduce radioactive materials in gaseous waste prior to discharge. The vacuum degasifier exhaust filter system is a ventilation exhaust treatment system that is governed by the Technical Specification. The vacuum degasifier will be operated under administrative controls without the exhaust filter for testing purposes. Activity releases as a consequence of such operations are expected to be well below levels that would require operation of the degasifier ventilation treatment system under TS 3.11.2.5. The vacuum degasifier exhaust filter system is expected to be inoperable beyond the 31 day limit of TS 3.11.2.5.a. A Special Report pursuant to Specification 6.9.2 has been [WILL BE ???] submitted to the NRC.

VII Does the proposed action create the need to make an application for amendment to the license other than to Appendix A?

YES NO X

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed change is a temporary change in the status and operation of plant systems described in the FSAR which is justified by this Safety Evaluation. Therefore, there is no need to revise the FSAR at this time, since no change in plant design or long-term operational intent is being made.

SAFETY EVALUATION SUMMARY

Title: Current Licensing Basis Update for Radioactive Liquid Waste System Leak or Failure (Release to Atmosphere) - FSAR 15.7.3

No. NL-98-004

Description of Change:

Update the design basis accident analysis provided in FSAR Section 15.7.3 for a radioactive liquid waste system leak or failure to reflect the as built design conditions, operating practices and current interfaces for the radioactive waste management systems and components.

SUMMARY

A. The licensing design basis, descnptions and safety evaluations contained in FSAR Section 2. 3. 5. 10. 11. 12 15. NUREG 0776. and the ODCM were considered in concluding that the proposed action does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the SAR. The accidents or malfunction of equipment important to safety that were previously evaluated and could be affected by the proposed action involves the failure of tanks and components, located outside containment, containing radioactive liquid, gases, and solids. These failures are evaluated in FSAR Section 2.4 and 15.7

The probability of a failure of tanks and associated components which could contain radioactive liquids outside containment are analyzed and descnbed in FSAR Sections 2.4.12.2. 2.4.12.3. 2.4.13.3. 15.7.2 and 15.7.3 and are not changed since all physical modifications which involved changes in system piping and components were performed in accordance with codes and standards specified in FSAR Section 3.2, including the requirements for Class "D" Augmented

With the implementation of the proposed action, the radiation exposure consequences of an unexpected and uncontrolled release of radioactivity that is stored or transferred in a waste system, as described in FSAR Sections 2 4 12.2. 2.4.12.3. 2 4 13.3. 15.7.2 and 15 7.3. is fess than the radionuclide concentrations of 10CFR20. Appendix B. Table II. Column 2 from expected radioactive liquid releases at the nearest potable water supply in an unrestricted area and is also a small fraction of 10CFR100 guidelines, i.e. 0.5 rem whole body. 1.5 rem thyroid. from design basis gaseous radioactive releases at the site boundary.

The gaseous radwaste system leaks or failures analyzed in FSAR Section 15.7.1 consider the following postulated accidents' main condenser offgas treatment system failure; malfunction of main turbine gland sealing system; and failure of air ejector lines The radwaste system changes that result in the proposed action do not affect any of these components, therefore the probability of occurrence and consequences of any of these events are not changed.

B. The proposed action involves updating the FSAR accident analysis to reflect a postulated failure of the RWCU phase separator tank in lieu of the evaporator concentrates tank and updated source terms. The systems that are directly or indirectly affected by the changes in the radwaste system do not perform any safety function nor do they interface with the safety related portion of those system that are classified as safety related. A review of the FSAR and the SER was conducted to determine the impact on the accidents and malfunctions considered As discussed in Section III. the only accidents affected involve radioactive releases from subsystems and components and no credit for the active function of components important to safety is assumed for those accidents previously evaluated in the FSAR and SER. Therefore, the proposed action and the associated radwaste related system changes do not create a possibility for an accident or malfunction of a different type than previously considered in the SAR.

SAFETY EVALUATION COVERSHEET

Title: Current Licensing Basis Update for Radioactive Liquid Waste System Leak or Failure (Release to Atmosphere) - FSAR 15.7.3

No. NL-98-004

UNIT # 1 & 2	
DCP # Not Applicable	
PROCEDURE #	Not Applicable
OTHER (ECO#, SPC#, By-Pass, RIE) Not Applicable	

SUSQUEHANNA STEAM ELECTRIC STATION
PENNSYLVANIA POWER & LIGHT COMPANY

REV.	PREPARED BY/ DATE	REVIEWED BY/ DATE	APPROVED BY*/ DATE	PORC MTG #/ DATE
0	M Glenn Lin 1/15/98	David O. Mattland 3/30/98	[illegible] 4/21/98	98-04-09/April 9, 1998

* This signature of the Responsible Supervisor indicates approval of the safety evaluation and confirms that interfaces with other disciplines, functional groups, etc. have been considered and have been incorporated into the evaluation as necessary. The Responsible Supervisor must be designated on Form NDAP-QA-0726-3.

A copy of the ACCEPTED Safety Evaluation must be forwarded to the Supervisor - Nuclear Licensing.

SAFETY EVALUATION # NL 98-004

Title: Current Licensing Basis Update for Radioactive Liquid Waste System Leak or Failure (Release to Atmosphere) -FSAR 15.7.3

READ "INSTRUCTIONS FOR COMPLETING NDAP-QA-0726-1"
BEFORE ANSWERING EACH QUESTION

I. System/Procedure/Experiment Identification. (Name and Number)

Liquid Waste Management System / 069/169/269
Solid Waste Management System / 068/168/268
SSES FSAR 15.7.3

II. Description and Implications of Proposed Action.

A. Fully describe the action and its purpose.

The proposed action is to update the Susquehanna Steam Electric Station - Final Safety Analysis Report (FSAR) Section 15.7.3 text and tables to reflect changes in the design and operation of the liquid and solid waste management systems as documented in Safety Evaluation NL 97-087. The specific action involves a reanalysis of the accident evaluation presented in this subsection based on an assumed failure of a different liquid waste system component, i.e. the reactor water cleanup (RWCU) phase separator tank, with updated design basis nuclide inventory.

The purpose of this FSAR section, per Regulatory Guide 1.70, is to describe and evaluate the consequences of the release to the atmosphere of radioactive gases resulting from the unexpected and uncontrolled release of radioactive liquids that are stored or transferred in a waste system. This analysis is performed and evaluated in accordance with NUREG 0800, Standard Review Plan, SRP 15.7.2, Radioactive Liquid Waste System Leak or Failure (Release to Atmosphere).

The analysis, currently presented in this FSAR section, postulates a failure of the evaporator concentrates tank and the release of a fraction of the radioactive iodine inventory in the tank to the radwaste building atmosphere and subsequently to the environment via the plant vent.

This analysis is not representative of the current design and operation of the radioactive waste management systems in that the radwaste evaporator and the associated evaporator concentrates tank is not used. With the changes in the design and operation of the radwaste management systems to reflect the Current Licensing Basis (CLB) project update, the RWCU phase separator tank would be projected to contain the highest iodine inventory and should be utilized in this analysis (i.e., the design basis iodine activity content (FSAR Tables 11.2-6 & 11.4-6) of liquid containing tanks located outside the containment (as listed in FSAR Table 11.2-16) dictates the selection of the RWCU phase separator for use in this analysis consistent with SRP 15.7.2 guidance, i.e. the RWCU phase separator tank contains the highest iodine inventory).

B. Identify all the components that will be affected.

The following plant systems, associated components and interfaces were reviewed for potential impacts resulting from the actions described:

LWMS Evaporator Concentrates Tank
SWMS Reactor Water Cleanup Phase Separator Tank
Condensate Demineralizer System / Ultrasonic Resin Cleaner
Reactor Water Cleanup System
Fuel Pool Cooling & Cleanup System
Plant Shielding & Radiation Zones

C. List Safety Functions of affected components.

1. NUREG-0800, Standard Review Plan Section 15.7.2 provides guidance for the evaluation of the radiological consequences of releases to the atmosphere of radioactive fission gases resulting from an unexpected and uncontrolled release of radioactive liquids that are stored or transferred in a waste system to determine that they are small fractions of the 10CFR100 guideline values. The tank or component for which a failure is assumed is typically based on the component with the highest design basis iodine and or dissolved noble gas concentration. Acceptance criteria is based on the resulting doses from the release of radioactive gases from the system being a small fraction of the 10CFR100 guideline values (i.e. as per SRP 15.7.2, if less than 0.5 rem to the whole body and 1.5 rem to the thyroid, no further review is required).

2. The **liquid and solid waste management systems** are described in FSAR Sections 11.2 and 11.4, respectively. These systems and associated components, including the vendors supplied and operated liquid and solid mobile processing equipment, **do not have safety related functions as part of their design basis.** However, portions of these systems are designed and constructed in accordance with the requirements for class 'D' Augmented as described in FSAR Section 3.2 and NRC Branch Technical Position ETSB No.11-1.

   The mobile pressurized liquid processing system is currently utilized as a replacement for the radwaste evaporators to process wastewaters from the chemical waste subsystem. The current vendor supplied and operated system is a pressurized demineralizer system. This equipment is designed, fabricated, and inspected in accordance with Regulatory Guide 1.143 with design details documented in Molten Metal Technology's PP&L/SSES Chem Waste Processing System Report dated 10/97 (PLI-84607). The potential use of a pressurized system, similar to the one currently in use, was previously evaluated in NL 93-008.

   The **evaporator concentrates tank** is presently an unused component within the chemical processing subsystem of the liquid waste management system.

   The **RWCU phase separator tank** is part of the solid waste management system and is used to collect and store sludge from backwashing the RWCU and fuel pool filter demineralizers.

3. The **condensate demineralizer system**, as described in FSAR Section 10.4.6, **has no safety related functions.** The system is designed to maintain the condensate at the required purity level by the removal of contaminants via the condensate demineralizers. An ultrasonic resin cleaner is used to remove insoluble iron oxides (and associated

radionuclides) deposited on the condensate demineralizer resin beads and to remove resin fines.

4. The **reactor water cleanup system**, as described in FSAR Section 5.4.8, continuously purifies the reactor water. The system **is not an engineered safety feature.** A small portion of the system is part of the reactor coolant pressure boundary up to and including the outermost containment isolation valve. The other portions of the system are isolated from the reactor. The reactor water is processed by filter demineralizers in this system with the purified water returned to the reactor pressure vessel, the main condenser, or to radwaste. The backwashing of the filter demineralizers in this system is directed to the RWCU phase separator tank for interim storage prior to dewatering and packaging for offsite shipment.

5. The **fuel pool cleanup system**, as described in FSAR Section 9.1.3, is used to maintain water clarity and quality in the fuel pools to facilitate underwater handling of fuel assemblies and to minimize fission and corrosion product buildup that pose a radiological hazard to operating personnel. This portion of the fuel pool cooling and cleanup system has no safety function as part of its design basis. The backwashing of the fuel pool demineralizers in this system was previously transferred to the waste sludge phase separator. However, with the current operational strategy this waste stream is directed to the RWCU phase separator tank for interim storage prior to dewatering and packaging for offsite shipment.

6. The **plant shielding and radiation zones**, as described in FSAR Section 12.3.2, have no active safety function except where shielding is used for environmental qualification of safety related equipment or for providing post accident access. The basic design objective is to reduce personnel exposures, in conjunction with a program of controlled personnel access to and occupancy of radiation areas, to levels that are ALARA and within the dose requirements of 10CFR20 and 10CFR50.

D. **Describe potential effects on Safety Functions.**

The proposed action of updating the FSAR analysis for accidental radioactive releases to the atmosphere due to liquid waste system leaks or failures will have no effect on safety related functions or on the safe shutdown of the plant.

Since chemical regeneration of condensate demineralizer resins is not performed, the need for the radwaste evaporators and the evaporator concentrates tank has been eliminated. The evaporator and concentrates tank has not been used to process chemical wastes since the mid 1980s and it is anticipated that in the foreseeable future that this equipment will not be needed for continued plant operation. Therefore, the analyses documented in **FSAR Sections 2.4.12.2, 2.4.12.3, 2.4.13.3 and 15.7.3** which utilize these components as a basis for the accident analyses needs to be updated to be consistent with current plant design and operation.

The changes in the design and operation of liquid and solid waste management systems impact the component activity inventories and consequently the liquid waste component accident analysis addressed in Section 15.7.3. The specific radwaste system changes that affect this analysis are: (1) condensate demineralizers are not regenerated; (2) URC is used to clean particulates from the condensate demineralizers; (3) radwaste evaporator is not used; (4) backwash frequencies and volumes for the RWCU and fuel pool filter demineralizers are decreased, resulting in an increase in the buildup and specific activity of the resins routed to the RWCU phase separator tanks; (5) the fuel pool filter demineralizer backwash is directed to the RWCU phase separator rather than the waste sludge phase separator; and (6) switching to an alternate RWCU phase separator occurs at yearly intervals rather than the 60 days previously assumed. With these changes the RWCU phase separator tank was found to contain the highest design basis radioactive iodine inventory.

Expected and design basis component activity inventories are documented in EC-RADN-1047 and 1048 for the liquid and solid waste management system components, respectively. EC-RADN-1064 evaluates the failure of the RWCU phase separator, in accordance with SRP 15.7.2 guidance, and demonstrates compliance with 10CFR100 limits and SRP 15.7.2 guidelines of 0.5 rem to the whole body and 1.5 rem to the thyroid.

The proposed action does not create a new release pathway to the environment nor will it result in the contamination of a non-radioactive system or reduce the physical or administrative barriers between a radioactive and a non-radioactive system or release point. Therefore, there is no change in the NRC IE Bulletin 80-10 System or Effluent Pathway classification in the ODCM. (This statement satisfies the requirements of Section 6.3.7 of PP&L Procedure NDAP-QA-0726)

The proposed action of updating FSAR Section 15.7.3 does not directly affect plant shielding and radiation zoning. However, the changes in the design and operation of the radwaste system which resulted in the proposed action will have an impact on the source terms and ALARA program requirements associated with affected radwaste equipment. This impact is addressed in the CLB updates to FSAR Sections 11.2, 11.4, 12.2 and 12.3. In addition, although not a direct result of the proposed action, the changes in the design and operation of the radwaste systems will also impact the accident analysis presented in FSAR Section 2.4.12.2, 2.4.12.3, and 2.4.13.3 for a radioactive release due to liquid containing tank failure (release to groundwater). The CLB update to the release to groundwater analysis is considered under a separate safety evaluation.

III Does the proposed action **increase the probability of occurrence or the consequences** of an accident or malfunction of equipment important to safety, as previously evaluated in the SAR? (Include specific reference to FSAR sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed action does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the SAR.

The following licensing design basis descriptions, associated safety evaluations, and analyses were considered in the evaluation of the proposed change:

FSAR Section 2.4.12.2 Accidental Releases
FSAR Section 2.4.12.3 Effluent Dilution
FSAR Section 2.4.13, Groundwater
FSAR Section 2.4.13.3, Accident Effects on Groundwater Quality
FSAR Section 3.2, Classification of Structures, Systems, and Components
FSAR Section 5.4.8, Reactor Water Cleanup
FSAR Section 10.4.6, Condensate Cleanup System
FSAR Section 11.1, Source Terms
FSAR Section 11.2, Liquid Waste Management System
FSAR Section 11.3, Gaseous Waste Management System
FSAR Section 11.4, Solid Waste Management System
FSAR Section 12.2, Radiation Sources
FSAR Section 12.3, Radiation Protection Design Features
FSAR Section 15.7, Radioactive Release From a Subsystems or Components
NUREG 0776, SSES Safety Evaluation Report

Based on a review of the above listed FSAR Sections and the SER, changes in the radwaste system design and operation which may have an impact on accidents or malfunctions of equipment important to safety are discussed in paragraphs below.

1. The probability of a failure of tanks and associated components which could contain radioactive liquids outside containment as analyzed in FSAR Section 2.4.12.2, 2.4.12.3, 2.4.13.3, and 15.7.3 is not changed since all physical modifications which involved changes in system piping and components were performed in accordance with codes and standards specified in FSAR Section 3.2, including the requirements for Class "D" Augmented.

2. FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3 evaluate the potential consequences of a postulated release of radioactive liquids to the groundwater due to single failures involving tanks and components containing radioactive materials located outside the reactor containment. The analysis presented in the FSAR and the SSES SER reflects a postulated rupture of the radwaste evaporator concentrates tank and the unimpeded release to the groundwater. The results of the analysis demonstrated compliance with 10CFR20 limits at the closest potable water supplies in an unrestricted area.

Based upon the changes made in the design and operation of liquid and solid waste management systems, where the evaporator concentrates tank is not used, the RWCU phase separator tank was found to contain the highest expected radioactive inventory. Component activity inventories are documented in EC-RADN-1047 and 1048 for the liquid and solid waste management system components, respectively. EC-RADN-1069 evaluates the rupture of the RWCU phase separator, in accordance with SRP 15.7.3 guidance, and demonstrates continued compliance with 10CFR20 limits at the closest potable water supply in an unrestricted area. This analysis also updates the surface and groundwater hydrology relative to the installation and use of onsite productions wells and the locations of off-site wells utilized as sources of potable water.

3. Liquid Radwaste System Failure is analyzed in FSAR Section 15.7.2 which identifies the bounding scenarios as a feedwater pipe break outside containment or a main steam pipe break outside containment (FSAR Subsections 15.6.6 and 15.6.4 respectively). FSAR Section 15.7.2 also addresses other potential releases outside containment which include small spills and leaks of radioactive materials inside structures housing processing equipment. Conservative values for leakage have been assumed and included in the assessment of routine plant liquid and gaseous releases in EC-RADN-1041 which demonstrated compliance with the 10CFR50 Appendix I guidelines and 10CFR20 concentration limits. The offsite dose that would result from any small spill, which could occur outside containment, would be negligible in comparison to the dose resulting from these routine releases.

4. FSAR Section 15.7.3 evaluates the potential offsite radiological effects of a postulated radioactive release to the atmosphere due to the failure of a LWMS component with the greatest amount of iodine inventory. The analysis presented in the FSAR and considered in the SSES SER utilizes the design basis iodine inventory in the evaporator concentrates tank. The results of this analysis demonstrated compliance with the acceptance criteria contained in SRP 15.7.2.

   Based upon the changes made in the design and operation of the liquid and solid waste management systems, the RWCU phase separator (in lieu of the evaporator concentrations tank) was identified as the component with the highest iodine inventory for the radioactive liquid containing components located outside of containment (per EC-RADN-1047 and 1048). EC-RADN-1064 evaluates the radiological consequences of the failure of the RWCU phase separator, based on the assumptions and guidance provided in SRP 15.7.2, and concludes that the resulting radiological doses remain at a small fraction of 10CFR100 limits and well within the SRP 15.7.2 guidelines of 0.5 rem whole body and 1.5 rem thyroid from gaseous releases at the site boundary.

IV Does the proposed action create a **possibility for an accident or malfunction of a different type** than any evaluated previously in the SAR? (Include reference to specific FSAR sections applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed action will not create a possibility for an accident or malfunction of a different type than any previously evaluated in the SAR.

The proposed action involves updating the FSAR accident analysis to reflect a postulated failure of the RWCU phase separator tank in lieu of the evaporator concentrates tank and updated source terms. The systems that are directly or indirectly affected by the changes in the radwaste related changes do not perform any safety function nor do they interface with the safety related portion of those systems that are classified as safety related. A review of the FSAR and the SER was conducted to determine the impact on the accidents and malfunctions considered. As discussed in Section III, the only accidents affected involve radioactive releases from subsystems and components and no credit for the active function of components important to safety is assumed for those accidents previously evaluated in the FSAR and SER. Therefore, the proposed actions and the associated radwaste related system changes do not create a possibility for an accident or malfunction of a different type than previously considered.

V Does the proposed action reduce the **margin of safety** as defined in the basis for any Technical Specification? (Include reference to specific Technical Specification sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

There is no reduction in the margin of safety defined in the basis of any Technical Specification.

The proposed actions do not alter the function or operation of any plant system governed by the Technical Specifications, their equivalent Improved Technical Specifications or Technical Requirements Manual (TRM) requirements. None of the parameters that are involved in the bases for the Technical Specifications would be adversely impacted by the proposed action. Consequently, updating FSAR Section 15.7.3 as described, would in no way reduce the margin of safety as defined in the Technical Specifications.

VI **Does the proposed action involve a change in a Technical Specification?**

YES ☐ NO ☒

If "YES", NDAP-QA-0731 "Technical Specification Changes" applies. A "YES" answer does not preclude activity up to a point just before it would physically affect the functioning of the plant.

Provide a discussion of the basis and criteria used in arriving at the above conclusion. If appropriate, describe the extent of activity and why it should be allowed to proceed prior to the Technical Specification change.

The proposed action does not require a change to the Technical Specifications.

The Unit 1 and Unit 2 Technical Specifications have been reviewed with particular attention to 3/4.11.1.3 Liquid Waste Treatment System, 3/4.11.1.4 Liquid Holdup Tank, 3/4.11.3 Solid Radwaste System, and 3/4.11.4 Total Dose. The proposed action which updates Section 15.7.3 does not impact the ability of the radwaste systems and equipment to perform their design function and will not affect existing or improved technical specifications/TRM requirements or their bases.

The radwaste system changes, as discussed in Section II of this safety evaluation, require reporting in the monthly and annual operating reports under Technical Specifications 6.9.1.6, 6.9.1.7, 6.9.1.8, 6.13, 6.14 and 6.15.

VII **Does the proposed action create the need to make an application for amendment to the license other than to Appendix A?**

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed action does not create the need to make an application for amendment to the facility license.

A review of the Unit 1 and Unit 2 Licenses has been performed. Based upon the discussions provided in the above sections, the proposed action does not create an unreviewed safety question and does not change any licensing commitments. The changes in the design, operation, and analyses for the radwaste and interfacing systems will be addressed via FSAR Change Notices. No amendment to either Unit License is required.

ADDITIONAL SPECIFIC EVALUATION CRITERIA FOR MODIFICATIONS CONCERNING RADIOACTIVE WASTE SYSTEMS

NOTE: For radioactive waste systems, the appropriate portions of 10CFR20, 30, 50, 71 and 100, the Technical Specifications and 40CFR190 are applicable.

NL-98-004 DATE 1/15/98

1. Does the modification conflict with the following guidelines:

   a. NDAP-QA-0153, "Quality Assurance Requirements for Radwaste Management [Group D Augmented] Systems"

      Yes ____ No X N/A ____ Because:

      1a. The proposed action performs no modifications to portions of Radwaste Systems that are designated as Group D Augmented as defined in NDAP-QA-0153, FSAR Section 3.2 and Branch Technical Position ETSB No. 11-1 Rev. 1 ("Design Guidance for Radioactive Waste Management Systems Installed in Light Water-Cooled Nuclear Power Reactor Plants"). The proposed action involves updating the accident analysis contained in FSAR 15.7.3 for current licensing basis to reflect plant modifications and other changes detailed in NL-97-087 and discussed in Section II of this SE.

   b. FSAR Chapters 11.2 "Liquid Waste Management Systems," 11.3 "Gaseous Waste Management Systems" and 11.4 "Solid Waste Management Systems"

      Yes X No ____ N/A ____ Because:

      1b. Refer to Section II of the SE for specific conflicts with FSAR Sections 11.2 & 11.4 descriptions. The proposed action is to update FSAR Section 15.7.3 to be consistent with changes being made to the liquid and solid waste management systems to reflect the current as built and operated plant. Upon completion of the current licensing basis update to FSAR Sections 11.2, 11.3, and 11.4, there will be no conflicts with the proposed action described in this safety evaluation.

c. FSAR Chapter 11.5 "Process and Effluent Radiological Monitoring and Sampling Systems"

Yes ____ No __X__ N/A ____ Because:

1c. The proposed action involves updating the accident analysis presented in FSAR Section 15.7.3 involving the failure of the RWCU phase separator tank. As detailed in the description of the accident analysis, no credit is assumed for the effectiveness or operability of process or effluent monitoring equipment in minimizing the consequences of the postulated failure. Therefore, there is no conflict between the proposed action and the requirements detailed in FSAR Section 11.5

2. Are the radiological consequences of unexpected and uncontrolled releases of radioactivity that is stored or transferred in a waste system a large fraction of the 10CFR100 guidelines, i.e., 0.5 rem whole body, 1.5 rem thyroid from gaseous releases, and greater than the radionuclide concentrations of 10CFR20, Appendix B, Table II, Column 2 from liquid releases at the nearest water supplies (See FSAR section 15.7.3 for more details)?

Yes ____ No __X__ N/A ____ Because:

2a As discussed in Section III of the SE, the radiological consequences of unexpected and uncontrolled releases of radioactivity that is stored or transferred in waste systems outside containment were determined to be a small fraction of 10CFR100 guidelines, i.e. less than 0.5 rem whole body and 1.5 rem thyroid from design basis gaseous radioactive releases at the site boundary, (per EC-RADN-1064) and also less than the radionuclide concentrations of 10CFR20, Appendix B, Table II, Column 2 from expected radioactive liquid releases at the nearest potable water supplies (per EC-RADN-1069).

PREPARED BY: MICHAEL J. CAMBRIA

DAVID A. MATCHICK / Senior Engineer / 1/15/98

Name/Title/Date

C. The proposed action does not alter the function or operation of any plant system governed by the Technical Specifications, their equivalent Improved Technical Specifications or Technical Requirements Manual (TRM) requirements. None of the parameters that are involved in the bases for the Technical Specifications would be adversely impacted by the proposed action. Consequently, updating FSAR Section 15.7.3 as described, would in no way reduce the margin of safety as defined in the Technical Specifications.

In addition, an 80-10 system or effluent pathway classification (per ODCM) review was performed. The results of this review determined that the proposed changes will not:

1. create a new release pathway to the environment,
2. result in the contamination of a non-radioactive system ,
3. reduce the physical or administrative barriers between a radioactive and non-radioactive system or release point.

SAFETY EVALUATION SUMMARY

Title: CLB Update for Liquid Containing Tank Failures

No. NL-97-094

Description of Change:

Current Licensing Basis (CLB) update for the postulated radioactive releases due to liquid-containing tank failure evaluation provided in the FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3 to reflect the as built design conditions, operating practices and current interfaces.

SUMMARY

A. The licensing design basis, descriptions, and safety evaluations contained in FSAR Section 2, 3, 5, 10, 11, 12, 15, and NUREG 0776 were considered in concluding that the proposed actions do not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the SAR. The accidents or malfunction of equipment important to safety that were previously evaluated and are the subject of the proposed actions in this safety evaluation involve the failure of tanks and components, located outside containment, containing radioactive liquids and solids. These failures are evaluated in FSAR Section 2.4 and 15.7.

The probability of a failure of tanks and associated components which could contain radioactive liquids outside containment as analyzed and described in FSAR Sections 2.4.12.2, 2.4.12.3, 2.4.13.3, 15.7.2 and 15.7.3 is not changed by the proposed actions since all physical modifications which involved changes in system piping and components were performed in accordance with codes and standards specified in FSAR Section 3.2, including the requirements for Class "D" Augmented.

With the implementation of the proposed actions, the consequences of an unexpected and uncontrolled release of radioactivity that is stored or transferred in a waste system, as described in FSAR Sections 2.4.12.2, 2.4.12.3, 2.4.13.3, 15.7.2 and 15.7.3, is less than the radionuclide concentrations of 10CFR20, Appendix B, Table II, Column 2 from liquid releases at the nearest potable water supply in an unrestricted area and is a small fraction of 10CFR100 guidelines, i.e. 0.5 rem whole body, 1.5 rem thyroid, from gaseous releases at the site boundary.

B. The proposed actions do not involve a postulated initiating event which would create the possibility of an accident of a different type and will not adversely affect any structures, systems, or components in performing a safety function. Therefore, the proposed actions do not create the possibility for an accident or malfunction of a different type than any previously evaluated in the SAR.

C. The proposed actions do not alter the function or operation of any plant system governed by the Technical Specifications, their equivalent Improved Technical Specifications or Technical Requirements Manual (TRM) requirements. None of the parameters that are involved in the bases for the Technical Specifications would be adversely impacted by the proposed action. Consequently, updating FSAR Sections 2.4.12 and 2.4.13 would in no way reduce the margin of safety as defined in the Technical Specifications.

In addition, an 80-10 system or effluent pathway classification (per ODCM) review was performed. The results of this review determined that the proposed changes will not:

1. create a new release pathway to the environment,
2. result in the contamination of a non-radioactive system ,
3. reduce the physical or administrative barriers between a radioactive and non-radioactive system or release point.

J

SAFETY EVALUATION COVERSHEET

Title: CLB Update for Radioactive Releases due to Liquid Containing Tank Failures

No. NL-97-094

UNIT # 1 & 2	
DCP # Not Applicable	
PROCEDURE #	Not Applicable
OTHER (ECO#, SPC#, By-Pass, RIE) Not Applicable	

SUSQUEHANNA STEAM ELECTRIC STATION
PENNSYLVANIA POWER & LIGHT COMPANY

0	[illegible] 4/5/98	David A. [illegible] 3/30/98	[illegible] 3/31/98	98-04-09/April 9,1998
REV.	PREPARED BY/ DATE	REVIEWED BY/ DATE	APPROVED BY*/ DATE	PORC MTG #/ DATE

* This signature of the Responsible Supervisor indicates approval of the safety evaluation and confirms that interfaces with other disciplines, functional groups, etc. have been considered and have been incorporated into the evaluation as necessary. The Responsible Supervisor must be designated on Form NDAP-QA-0726-3.

A copy of the <u>ACCEPTED</u> Safety Evaluation must be forwarded to the Supervisor - Nuclear Licensing.

SAFETY EVALUATION # NL 97-094

Title: CLB Update for Radioactive Releases due to Liquid Containing Tank Failures

READ "INSTRUCTIONS FOR COMPLETING NDAP-QA-0726-1"
BEFORE ANSWERING EACH QUESTION

I. System/Procedure/Experiment Identification. (Name and Number)

Liquid Waste Management System / 069/169/269
Solid Waste Management System / 068/168/268
SSES FSAR 2.4.12 and 2.4.13

II. Description and Implications of Proposed Action.

A. Fully describe the action and its purpose.

The proposed action is to update the Susquehanna Steam Electric Station - Final Safety Analysis Report (FSAR) Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3 text, tables and figures to reflect changes in the design and operation of the liquid and solid waste management systems and in the assessment of the hydrogeologic conditions at SSES site. The specific action involves a reanalysis of the accident presented in these sections based on an assumed failure of the reactor water cleanup (RWCU) phase separator tank with updated expected nuclide inventory and site hydrogeologic parameters.

The purpose of these FSAR sections, per Regulatory Guide 1.70, is to describe and evaluate the ability of the surface and groundwater environment to disperse, dilute or concentrate accidental liquid releases of radioactive effluents as related to existing and potential future water users. This analysis is performed and evaluated in accordance with NUREG 0800, Standard Review Plan, SRP 15.7.3, Postulated Radioactive Releases due to Liquid Containing Tank Failures.

The analysis, as currently presented in FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3, postulates a failure of the evaporator concentrates tank based on the assumption that the radionuclide concentration and the total radioactive material content in this tank will result in the highest concentrations of radioactive materials at the nearest potable water supply, in an unrestricted area. This analysis is not representative of the current design and operation of the radioactive waste management systems in that the radwaste evaporator and the associated evaporator concentrates tank are not used. Furthermore, a review of the expected activity content (FSAR Tables 11.2-5 & 11.4-5) of liquid containing tanks located outside the containment (as listed in FSAR Table 11.2-16) dictates the selection of the RWCU phase separator for use in this analysis consistent with SRP 15.7.3 guidance, i.e. the RWCU phase separator tank contains the highest concentrations and quantity of radioactive materials. With the changes in the design and operation of the radwaste management systems to reflect the Current Licensing Basis (CLB) project update, the RWCU phase separator tank would continue to be projected to contain the highest concentration and quantity of radioactive materials.

In addition to the above, site investigations and data collection activities since the submission of the FSAR, have resulted in changes to hydrogeological parameters that were used in this analysis. The update to this hydrogeologic information is not reflected in the current FSAR analysis.

A detailed description and evaluation of the impact of the changes in the design and operation of the liquid and solid waste management systems, for the CLB project, is provided in Safety Evaluation NL 97-087.

The following Dames and Moore reports updated the hydrogeologic conditions at the SSES site:

Assessment of Hydrogeologic Conditions, SSES, Jan. 1986
Environmental/Feasibility for Groundwater Supply, SSES, Sept. 1986
Evaluation of Surface Drainage Systems and Spill Response Plans at SSES, Dec. 1987
Aquifer Performance and Evaluation Study for Groundwater Supply, SSES, Feb. 1993

B. Identify all the components that will be affected.

The following plant systems, associated components and interfaces were reviewed for potential impacts resulting from the actions described:

LWMS Evaporator Concentrates Tank
SWMS Reactor Water Cleanup Phase Separator Tank
Condensate Cleanup Demineralizer System / Ultrasonic Resin Cleaner
Reactor Water Cleanup System
Fuel Pool Cooling & Cleanup System
Plant Shielding & Radiation Zones

C. List Safety Functions of affected components.

1. NUREG-0800, Standard Review Plan Section 15.7.3 provides guidance for the evaluation of the consequences of single failures involving tanks and associated components containing radioactive liquids outside containment. The tank or component for which a failure is to be assumed is based on the expected (NUREG-0016) nuclide concentration and the total radioactive material content that will result in the highest concentrations of radioactive material at the nearest potable water supply in an unrestricted area that has the potential to be affected by the accident. Acceptance criteria is based on meeting (1) the relevant requirements of General Design Criteria 60 as it relates to the radioactive waste management system being designed to control releases of radioactive materials to the environment and (2) the failure should not result in nuclide concentrations in excess of the limits of 10CFR20, Appendix B, Table II, Column 2 at the nearest potable water supply in an unrestricted area.

2. The **liquid and solid waste management systems** are described in FSAR Sections 11.2 and 11.4, respectively. These systems and associated components, including the vendors supplied and operated liquid and solid mobile processing equipment, **do not have safety related functions as part of their design basis.** However, portions of these systems are designed and constructed in accordance with the requirements for class 'D' Augmented as described in FSAR Section 3.2 and NRC Branch Technical Position ETSB No.11-1.

   The mobile pressurized liquid processing system is currently utilized as a replacement for the radwaste evaporators to process wastewaters from the chemical waste subsystem. The current vendor supplied and operated system is a pressurized demineralizer system. This

equipment is designed, fabricated, and inspected in accordance with Regulatory Guide 1.143 with design details documented in Molten Metal Technology's PP&L/SSES Chem Waste Processing System Report dated 10/97 (PLI-84607). The potential use of a pressurized system, similar to the one currently in use, was previously evaluated in NL 93-008.

The **evaporator concentrates tank** is presently an unused component within the chemical processing subsystem of the liquid waste management system.

The **RWCU phase separator tank** is part of the solid waste management system and is used to collect and store sludge from backwashing the RWCU and fuel pool filter demineralizers.

3. The **condensate cleanup system**, as described in FSAR Section 10.4.6, **has no safety related functions**. The system is designed to maintain the condensate at the required purity level by the removal of contaminants via the condensate demineralizers. An ultrasonic resin cleaner is used to remove insoluble iron oxides (and associated radionuclides) deposited on the condensate demineralizer resin beads and to remove resin fines.

4. The **reactor water cleanup system**, as described in FSAR Section 5.4.8, continuously purifies the reactor water. The system **is not an engineered safety feature.** A small portion of the system is part of the reactor coolant pressure boundary up to and including the outermost containment isolation valve. The reactor water is processed by filter demineralizers in this system with the purified water returned to the reactor pressure vessel, the main condenser, or to radwaste. The backwashing of the filter demineralizers in this system is directed to the RWCU phase separator tank for interim storage prior to dewatering and packaging for offsite shipment.

5. The **fuel pool cleanup system**, as described in FSAR Section 9.1.3, is used to maintain water clarity and quality in the fuel pools to facilitate underwater handling of fuel assemblies and to minimize fission and corrosion product buildup that pose a radiological hazard to operating personnel. This portion of the fuel pool cooling and cleanup system **has no safety function** as part of its design basis. The backwashing of the fuel pool demineralizers in this system was previously transferred to the waste sludge phase separator. However, with the current operational strategy this waste stream is directed to the RWCU phase separator tank for interim storage prior to dewatering and packaging for offsite shipment.

6. The **plant shielding and radiation zones**, as described in FSAR Section 12.3.2, **have no active safety function** except where shielding is used for environmental qualification of safety related equipment or for providing post accident access. The basic design objective is to reduce personnel exposures, in conjunction with a program of controlled personnel access to and occupancy of radiation areas, to levels that are ALARA and within the dose requirements of 10CFR20 and 10CFR50.

D. Describe potential effects on Safety Functions.

The proposed action of updating the FSAR analysis for accidental radioactive releases to the groundwater will have no effect on safety related functions or on the safe shutdown of the plant.

Since chemical regeneration of condensate demineralizer resins is not performed, the need for the radwaste evaporators and the evaporator concentrates tank has been eliminated. The evaporator and concentrates tank has not been used to process chemical wastes since the mid-1980's and it is anticipated that in the foreseeable future that this equipment will not be needed for continued plant operation. Therefore, the analyses documented in FSAR Sections 2.4.12.2, 2.4.12.3, 2.4.13.3 and 15.7.3 which utilize this component as a basis for the accidents analyses needs to be updated to be consistent with current plant design, operation, and site conditions.

The changes in the design and operation of liquid and solid waste management systems impact the component activity inventories and consequently the liquid waste component accident analysis addressed in Sections 2.4.12 and 2.4.13. The specific radwaste system changes that affect this analysis are: (1) condensate demineralizers are not regenerated; (2) URC is used to clean particulates from the condensate demineralizers; (3) radwaste evaporator is not used; (4) backwash frequencies and volumes for the RWCU and fuel pool filter demineralizers are decreased, resulting in an increase in the buildup and specific activity of the resins routed to the RWCU phase separator tanks; (5) the fuel pool filter demineralizer backwash is directed to the RWCU phase separator rather than the waste sludge phase separator; and (6) switching to an alternate RWCU phase separator occurs at yearly intervals rather than the 60 days previously assumed. With these changes the RWCU phase separator tank was found to contain the highest expected radioactive inventory.

Expected and design basis component activity inventories are documented in EC-RADN-1047 and 1048 for the limiting liquid and solid waste management system components, respectively. EC-RADN-1069 evaluates the failure of the RWCU phase separator, in accordance with SRP 15.7.3 guidance, and demonstrates continued compliance with 10CFR20 limits at the nearest potable water supply (Danville) that could be affected in an unrestricted area. This analysis also updates the surface and groundwater hydrology relative to changes in the aquifer rate of discharge to the Susquehanna River, dilution downstream of the Station, the installation and use of onsite productions wells and the locations and impact assessment to offsite wells utilized as sources of potable water.

The proposed actions do not create a new release pathway to the environment nor will they result in the contamination of a non-radioactive system or reduce the physical or administrative barriers between a radioactive and a non-radioactive system or release point. Therefore, there is no change in the NRC IE Bulletin 80-10 System or Effluent Pathway classification in the ODCM. (This statement satisfies the requirements of Section 6.3.7 of PP&L Procedure NDAP-QA-0726)

The proposed action of updating FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3 does not directly affect plant shielding and radiation zoning. However, the changes in the design and operation of the radwaste system which resulted in the proposed action will have an impact on the source terms and ALARA program requirements associated with affected radwaste equipment. This impact is addressed in the CLB updates to FSAR Sections 11.2, 11.4, 12.2 and 12.3. In addition, although not a direct result of the proposed action, the changes in the design and operation of the radwaste systems will also impact the design basis accident analysis presented in FSAR Section 15.7.3 for a radioactive liquid waste system leak or failure (release to atmosphere). The CLB update to this analysis is considered under a separate safety evaluation.

III Does the proposed action increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the SAR? (Include specific reference to FSAR sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed actions do not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the SAR.

The following licensing design basis descriptions, associated safety evaluations, and analyses were considered in the evaluation of the proposed changes:

FSAR Section 2.4.12.2 Accidental Releases
FSAR Section 2.4.12.3 Effluent Dilution
FSAR Section 2.4.13, Groundwater
FSAR Section 2.4.13.3, Accident Effects on Groundwater Quality
FSAR Section 3.2, Classification of Structures, Systems, and Components
FSAR Section 5.4.8, Reactor Water Cleanup
FSAR Section 10.4.6, Condensate Cleanup System
FSAR Section 11.1, Source Terms
FSAR Section 11.2, Liquid Waste Management System
FSAR Section 11.3, Gaseous Waste Management System
FSAR Section 11.4, Solid Waste Management System
FSAR Section 12.2, Radiation Sources
FSAR Section 12.3, Radiation Protection Design Features
FSAR Section 15.7, Radioactive Release From a Subsystems or Components
NUREG 0776, SSES Safety Evaluation Report

Based on a review of the above listed FSAR Sections and the SER, changes in the radwaste system design and operation and in the hydrogeologic conditions at the site which may have an impact on accidents or malfunctions of equipment important to safety are discussed in paragraphs below.

1. The probability of a failure of tanks and associated components which could contain radioactive liquids outside containment as analyzed in FSAR Section 2.4.12.2, 2.4.12.3, 2.4.13.3, and 15.7.3 is not changed since all physical modifications which involved changes in system piping and components were performed in accordance with codes and standards specified in FSAR Section 3.2, including the requirements for Class "D" Augmented.

2. FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3 evaluate the potential consequences of a postulated release of radioactive liquids to the groundwater due to single failures involving tanks and components containing radioactive materials located outside the reactor containment. The analysis presented in the FSAR and the SSES SER reflects a postulated rupture of the radwaste evaporator concentrates tank and the unimpeded release to the groundwater. The results of the analysis demonstrated compliance with 10CFR20 limits at the closest potable water supplies in an unrestricted area.

Based upon the changes made in the design and operation of liquid and solid waste management systems, where the evaporator concentrates tank is not used, the RWCU phase separator tank was found to contain the highest expected radioactive inventory. Component activity inventories are documented in EC-RADN-1047 and 1048 for the liquid and solid waste management system components, respectively. EC-RADN-1069 evaluates the rupture of the RWCU phase separator, in accordance with SRP 15.7.3 guidance, and demonstrates continued compliance with 10CFR20 limits at the closest potable water supply in an unrestricted area. This analysis also updates the surface and groundwater hydrology relative to the installation and use of onsite productions wells and the locations of off-site wells utilized as sources of potable water.

3. Liquid Radwaste System Failure is analyzed in FSAR Section 15.7.2 which identifies the bounding scenarios as a feedwater pipe break outside containment or a main steam pipe break outside containment (FSAR Subsections 15.6.6 and 15.6.4 respectively). FSAR Section 15.7.2 also addresses other potential releases outside containment which include small spills and leaks of radioactive materials inside structures housing processing equipment. Conservative values for leakage have been assumed and included in the assessment of routine plant liquid and gaseous releases in EC-RADN-1041 which demonstrated compliance with the 10CFR50 Appendix I guidelines. The offsite dose that would result from any small spill, which could occur outside containment, would be negligible in comparison to the dose resulting from these routine releases.

4. FSAR Section 15.7.3 evaluates the potential offsite radiological effects of a postulated radioactive release to the atmosphere due to the failure of a LWMS component with the greatest amount of iodine inventory. The analysis presented in the FSAR and considered in the SSES SER utilizes the design basis iodine inventory in the evaporator concentrates tank. The results of this analysis demonstrated compliance with the acceptance criteria contained in SRP 15.7.2.

Based upon the changes made in the design and operation of the liquid and solid waste management systems, the RWCU phase separator (in lieu of the evaporator concentrations tank) was identified as the component with the highest iodine inventory for the radioactive liquid containing components located outside of containment (per EC-RADN-1047 and 1048). EC-RADN-1064 evaluates the radiological consequences of the failure of the RWCU phase separator, based on the assumptions and guidance provided in SRP 15.7.2, and concludes that the resulting radiological doses remain at a small fraction of 10CFR100 limits and well within the SRP 15.7.2 guidelines of 0.5 rem whole body and 1.5 rem thyroid from gaseous releases at the site boundary.

IV Does the proposed action create a **possibility for an accident or malfunction of a different type** than any evaluated previously in the SAR? (Include reference to specific FSAR sections applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed action will not create a possibility for an accident or malfunction of a different type than any previously evaluated in the SAR.

The proposed action involves updating the FSAR accident analysis to reflect a postulated failure of the RWCU phase separator tank in lieu of the evaporator concentrates tank, updating source terms and site conditions. The systems that are directly or indirectly affected by the changes in the radwaste related changes do not perform any safety function nor do they interface with the safety related portion of those system that are classified as safety related. A review of the FSAR and the SER was conducted to determine the impact on the accidents and malfunctions considered. As discussed in Section III, the only accidents affected involve radioactive releases from subsystems and components and no credit for the active function of components important to safety is assumed for those accidents previously evaluated in the FSAR and SER. Therefore, the proposed actions and the associated radwaste related system changes do not create a possibility for an accident or malfunction of a different type than previously considered.

V Does the proposed action reduce the **margin of safety** as defined in the basis for any Technical Specification? (Include reference to specific Technical Specification sections that are applicable.)

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

There is no reduction in the margin of safety defined in the basis of any Technical Specification.

The proposed actions do not alter the function or operation of any plant system governed by the Technical Specifications, their equivalent Improved Technical Specifications or Technical Requirements Manual (TRM) requirements. None of the parameters that are involved in the bases for the Technical Specifications would be adversely impacted by the proposed action. Consequently, updating FSAR Sections 2.4.12 and 2.4.13 would in no way reduce the margin of safety as defined in the Technical Specifications.

VI Does the proposed action involve a change in a Technical Specification?

YES ☐ NO ☒

If "YES", NDAP-QA-0731 "Technical Specification Changes" applies. A "YES" answer does not preclude activity up to a point just before it would physically affect the functioning of the plant.

Provide a discussion of the basis and criteria used in arriving at the above conclusion. If appropriate, describe the extent of activity and why it should be allowed to proceed prior to the Technical Specification change.

The proposed actions do not require a change to the Technical Specifications.

The Unit 1 and Unit 2 Technical Specifications have been reviewed with particular attention to 3/4.11.1.3 Liquid Waste Treatment System, 3/4.11.1.4 Liquid Holdup Tank, 3/4.11.3 Solid Radwaste System, and 3/4.11.4 Total Dose. The proposed action which updates Section 2.4.12 and 2.4.13 do not impact the ability of the radwaste systems and equipment to perform their design function and will not affect existing or improved technical specifications/TRM requirements or their bases.

The radwaste system changes, as discussed in Section II of this safety evaluation, require reporting in the monthly and annual operating reports under Technical Specifications 6.9.1.6, 6.9.1.7, 6.9.1.8, 6.13, 6.14 and 6.15.

VII **Does the proposed action create the need to make an application for amendment to the license other than to Appendix A?**

YES ☐ NO ☒

Provide a discussion of the basis and criteria used in arriving at the above conclusion.

The proposed action does not create the need to make an application for amendment to the facility license.

A review of the Unit 1 and Unit 2 Licenses has been performed. Based upon the discussions provided in the above sections, the proposed actions do not create an unreviewed safety question and do not change any licensing commitments. The changes in the design, operation, and analyses for the radwaste, interfacing systems, and site hydrogeologic conditions will be addressed via FSAR Change Notices. No amendment to either Unit License is required.

ADDITIONAL SPECIFIC EVALUATION CRITERIA FOR MODIFICATIONS CONCERNING RADIOACTIVE WASTE SYSTEMS

NOTE: For radioactive waste systems, the appropriate portions of 10CFR20, 30, 50, 71 and 100, the Technical Specifications and 40CFR190 are applicable.

NL-97-094 DATE 12/22/97

1. Does the modification conflict with the following guidelines:

   a. NDAP-QA-0153, "Quality Assurance Requirements for Radwaste Management [Group D Augmented] Systems"

      Yes ____ No X N/A ____ Because:

      1a. The proposed actions performs no modifications to portions of Radwaste Systems that are designated as Group D Augmented as defined in NDAP-QA-0153, FSAR Section 3.2 and Branch Technical Position ETSB No. 11-1 Rev. 1 ("Design Guidance for Radioactive Waste Management Systems Installed in Light Water-Cooled Nuclear Power Reactor Plants"). The proposed actions involve updating the FSAR for current licensing basis to reflect plant modifications and other changes as presented in Section II of this SE. Previous plant modifications, as referenced in the SE, were performed in a manner consistent with the guidelines presented in NDAP-QA-0153.

   b. FSAR Chapters 11.2 "Liquid Waste Management Systems," 11.3 "Gaseous Waste Management Systems" and 11.4 "Solid Waste Management Systems"

      Yes X No ____ N/A ____ Because:

      1b. The analysis, as currently presented in FSAR Sections 2.4.12.2, 2.4.12.3, and 2.4.13.3, postulates a failure of the evaporator concentrates tank based on the assumption that the radionuclide concentration and the total radioactive material content in this tank will result in the highest concentrations of radioactive materials at the nearest potable water supply, in an unrestricted area. This analysis is not representative of the current design and operation of the radioactive waste management systems in that the radwaste evaporator and the associated evaporator concentrates tank are not used

c. FSAR Chapter 11.5 "Process and Effluent Radiological Monitoring and Sampling Systems"

Yes ____ No __X__ N/A ____ Because:

1c. The proposed action involves updating the accident analysis presented in FSAR Section 2.4.12 and 2.4.13. Due to the low probability of occurrence, low consequences (compliance with 10CFR20 limits) and impracticality of providing monitoring and controls, the design basis of the process and effluent radiation monitoring and sampling system does not include provisions for monitoring releases via this postulated scenerio.

2. Are the radiological consequences of unexpected and uncontrolled releases of radioactivity that is stored or transferred in a waste system a large fraction of the 10CFR100 guidelines, i.e., 0.5 rem whole body, 1.5 rem thyroid from gaseous releases, and greater than the radionuclide concentrations of 10CFR20, Appendix B, Table II, Column 2 from liquid releases at the nearest water supplies (See FSAR section 15.7.3 for more details)?

Yes ____ No __X__ N/A ____ Because:

2a. As discussed in Section III of the SE, the radiological consequences of unexpected and uncontrolled releases of radioactivity that is stored or transferred in waste systems outside containment were determined to be a small fraction of 10CFR100 guidelines, i.e. less than 0.5 rem whole body and 1.5 rem thyroid from gaseous releases at the site boundary, (per EC-RADN-1064) and less than the radionuclide concentrations of 10CFR20, Appendix B, Table II, Column 2 from liquid releases at the nearest potable water supplies (per EC-RADN-1069).

PREPARED BY: MICHAEL J. CAMBRIA

DAVID A. MATCHICK / Senior Engineer / 12/22/97

Name/Title/Date