GE Nuclear Energy

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U.S. Nuclear Regulatory Commission
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REFERENCE: SNM-2500
Docket 72-1
TAC No. L23091

SUBJECT: Response to USNRC Request for Additional Information dated May 16, 2003

Enclosed are the following documents:

1) 1 copy of the GE Morris Operation response to the subject request for additional information

Please acknowledge receipt of this transmittal by signing and returning a copy of this letter to E. W. Secko at the above address.

If there are any questions regarding this transmittal, please contact E. W. Secko at the above phone number.

Sincerely,

E. W. Secko
Regulatory Compliance Manager
GE, Morris Operation

Enclosures

I acknowledge receipt of:
1) GE-MO response to USNRC RAI dated September 29, 2003

Signed _____ Title _____ Date _____

NMSS01

Response to NRC Request for Additional Information dated May 16, 2003

GENERAL DISCUSSION

Detailed here are specific answers to questions listed in the RAI. Reference information for some of the questions is included herein. When support documentation was required, it is included as attachments and indexed on the last pages of this document. Additionally, when required, revisions to specific pages of the CSAR have been made, and included in the RAI response for reference use and are transmitted separately as a CSAR revision.

As was discussed during the meeting at Morris Operation, the submittal of the RAI answers was being made in two parts. The first part was submitted in August. This submittal includes the answers provided in the first submittal and the RAI questions, so all RAI related questions and answers are in the same document. In addition the following RAI responses from the first submittal have been revised: 1-3, 1-7, 1-8, 1-11, 3-2, 3-7, 4-3, 4-11, 4-13, and 5-4.

As stated in the RAI, the NRC has not issued any written guidance for wet storage ISFSIs. The applicability of NUREG-1800 was not determined prior to the GE-MO license renewal application, and NUREG-1801 wasn't published until 2001, after the GE-MO submittal in 2000. Additionally, the Preliminary Guidance Document referenced in the RAI to Virginia Electric and Power Company's VEPCO dry cask ISFSI relicensing also wasn't published until 2001. Because of the above, additional time, beyond the original specified submittal date was required to properly review these documents and determine applicability to the GE-MO license renewal application. It is the view of Morris Operation, that these documents are not directly applicable to Morris Operation.

Paragraph 2 on page 1 of 27 of the RAI references applicability of shipping to this review. Spent fuel storage, is limited to the fuel on hand as specified in Amendment 11 by Utility, Type, Cladding, Bundle Array, and Total Bundles, and the basins are essentially fuel. GE has no intention to receive any more fuel at Morris Operation. Even though there is no definite date on the opening of a Federal spent fuel repository, or any direct, or inferred intent by any of the involved utilities for return of their fuel, equipment to transfer and/or ship fuel is still included in the CSAR, Section 5.0. If or when fuel shipping becomes a reality, plans, procedures, processes and equipment appropriate for the type of shipping cask approved at the time would be developed and appropriate revisions to the CSAR and/or license amendment would be made.

Edward W. Secko
Regulatory Compliance Manager
GE Morris Operation

General Electric Corporation
Morris Operation
Docket No. 72-1
SNM-2500

Request for Additional Information for General Electric - Morris Operation License Renewal Application

SECTION 1 -IDENTIFICATION OF SSCS SUBJECT TO AGING MANAGEMENT

1-1 Provide a list of SSCs that are subject to an AMR and a list of SSCs that are not subject to an AMR. Describe the process used to determine the SSCs that are subject to an AMR.

Response – SSCs subject to an AMR are specified in Section 11.3 of the CSAR and are part of the original licensing basis for Morris Operation.

SSCs subject to an AMR

- **Fuel Storage Basin concrete walls, floors and expansion gate**
- **Fuel Storage Basin stainless steel liner**
- **Fuel Storage System including baskets and supporting grid**
- **Unloading Pit doorway guard**
- **Filter Cell Structure**

SSCs not subject to an AMR are due to there being no emergency condition generated by the failure of any of these systems. This will be detailed in subsequent questions.

SSCs not subject to an AMR

- **Air compressors**
- **Basin leak detection system**
- **Basin water chillers**
- **Basin water level monitor**
- **Basin filter system**
- **Demineralized water system**
- **Fuel handling cranes and associated fuel handling equipment**
- **Off-site power**
- **Standby diesel generator**
- **Ventilation system**
- **Water supply well**
- **Water tower**

1-2 The SER and the EA for the license renewal will require an assessment of the AMR for each SSC relied on in the applicant's Consolidated Safety Analysis Report (CSAR) (Ref. 4). This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Identify those SSCs, other than the SSCs important to safety listed in Section 11.3 of the Consolidated Safety Analysis Report (CSAR), that are relied upon to:

a. Maintain the conditions required to store spent fuel safely;

b. Prevent damage to the spent fuel or the high-level radioactive waste container during handling and storage; or

c. Provide reasonable assurance that spent fuel can be possessed, stored, and transferred without undue risk to the health and safety of the public.

Response – See answer to Question 1-1, "SSCs not subject to an AMR".

1-3 The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of the license renewal review and which will support the staff development of the SER and the EA.

Provide a list of SSCs that are not important to safety but whose failure could prevent an important to safety function from being fulfilled or whose failure as a support SSC could prevent an important to safety function from being fulfilled. Also, describe the process used to determine this list of SSCs and the functions performed by these SSCs.

The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Response – There are no not important to safety SSCs at Morris Operation whose failure could prevent an important to safety function from being fulfilled.

Discussion on impact of loss of SSCs not important to safety

Air Compressors – replaced in 1998. The compressors are redundant, one compressor can supply all the air needs for the site, but both compressors can be operated at the same time if greater volume is required. Impact of loss of the compressor systems on basin related activities are as follows: The compressors provide air to the basin level indicator (see Basin Level below), basin LDS pumpout (see Basin Liner Leak Detection System below), ventilation dampers (dampers fail open) and the basin filter flow control valve (fails as is). Failure of the compressors would not cause a failure in any important to safety system.

Basin Filter System - The basin filter system continuously draws water from the basin skimmers maintaining outstanding water clarity. This system's simple robust design maintains high reliability. During periods when the basin filter was shut down, sometimes in excess of 6 weeks for maintenance activities, no measurable degradation of basin water quality was observed.

Basin Liner Leak Detection System - Pump outs are continuously recorded on a strip-chart recorder and the information reviewed once a day. Failure of the pump does not pose a hazard, as a back-up pump is available. Additionally, increased surveillance of the pool level is sufficient to mitigate any loss of this system. The system also has localized instrumentation that is monitored shiftly by the operator on rounds. Extended system outage would result in equilibration of the water level on both sides of the basin liner resulting in no impact on pool performance or safety.

Basin Water Chillers – as described in the CSAR, the chillers, along with all associated piping, pumps, valves, and heat exchangers were installed new in 2000. These units are redundant and only one set is necessary to maintain basin water temperature. The only scenario that could cause both chillers to be inoperable, would be loss of both off-site power feeds and the stand-by diesel generator. An event that has never happened in the history of GE-MO. However, as shown elsewhere in the report on basin heat-up, if this event occurred, normal makeup water to off-set effects of evaporation and the slow evaporation rate allow more than ample time to repair/replace the chillers, including bringing in skid mounted units to temporarily cool the basin water while the permanent units are being replaced. Maintenance of cooling with makeup water addition only can be supported indefinitely.

Basin Water Level Monitor - Computer monitored (SIMS System) automatically monitors water level and provides an alarm at the guard station.Operations personnel also monitor level during rounds and manual record the basin water level 6 times a day. If this system failed, visual observation by the shift operator would detect any decrease in water level. Pool level is also visible via remote cameras located in the basin area which provide monitoring of the basin from the Central Alarm Station. In addition, due to the location of the suction lines for the basin water chillers, after a drop of less than 31 inches, the basin chiller system would go into alarm.

Demineralized Water System – The demineralized water system (including piping) was replaced in 1996. It is a skid mounted resin bed system with its own computer monitoring. If output water quality is out of specification, it automatically notifies the supplier and sounds a local alarm. The supplier normally arrives within 24 hours to replace the system resin beds. Typically the basin makeup water is 236 gallons per day with 50,000 gallons available by gravity feed from the site water tower. The computer runs on 110 volts, so if all site power was lost, this unit could be connected to one of our many 110/220 volt generators.

Fuel Handling Cranes and Equipment – The fuel handling cranes are maintained under the GE-MO preventative maintenance program, and inspected in accordance with the requirements specified in 10 CFR 1910.179 and ANSI B30-2. Yearly inspections are performed by an independent contractor whose crane inspection services are accredited by the U.S. Department of Labor under 29 CFR 1919 to inspect, test and certify cranes. All grapples and associated equipment used to handle fuel or fuel baskets are laid away, and prior to use will be inspected. Repair and/or replacement will be accomplished as required based on the results of the inspections. All are described in Section 5.0 of the CSAR.

Off-site Power – Morris Operation is fed by 2 separate off site power sources with the primary feed coming from Dresden Station. Off-site power is extremely stable with no more than 2 or 3 failures of both feeds at the same time in over 30 years. Those were all during winter periods and were the result of heavy ice storms.

Standby Diesel Generator – The diesel generator can supply backup power to all site systems, including lighting. It is maintained by a diesel generator contractor. Additionally, it is tested bi-weekly as specified in Operability Test 16-90 and subjected to an emergency start/loading scenario yearly as specified in Operability Test 16-91. In approximately 30 years, total off-site power failed an estimated approximately 2 or 3 times, but the generator never failed to start.

Water Tower – Inspected by a nationally established contract company specializing in tanks and towers with the ability to inspect to API and AWWA standards. The tower is divided to provide 10,000 gallons for normal use and approximately 40,000 gallons for emergency use. The tower provided gravity feed to the site. With current water useage (~427.4 Gallons per day), it could continue to supply site needs for over 100 days. Water conservation measures could be implemented to extend this capability. Additionally, water can be pumped directly to the site water system bypassing the tower.

Site Water Well – The well had a new pump and discharge pipe installed in March, 2002. The pump has a 150 gpm capacity. If a complete loss of site power occurred the site would rely on gravity feed from the tower (discussed above). In the very unlikely event of an extended outage, water can be trucked in and pumped to the tower using truck borne pumps, or pumped from the tanker directly to the water system.

Ventilation System – Air is taken in through the air inlet plenum is distributed through the process building, passed through the sand filter and exhausted out the 300 foot tall exhaust stack. The sand filter was sized to provide negative pressure inside the original reprocessing facility. Air quality is monitored at the facility inlet, at the sand filter inlet and sand filter exhaust. Until 1983 the ventilation system was configured to operate as originally designed for a fuel reprocessing plant with a flow of 24,000 CFM through the filter. During 1983, the ventilation system was re-configured to operate as it does today, at a flow of 14,000 CFM through the filter. The sand filter D/P has stayed effectively constant over the 20 years since the change in flow velocity. Routine air samples continue to show the following emissions :

	Vent Supply	Stack Inlet
Alpha (μCi/ml)	4.79x10-13	MDA (~1x10-15)
Beta (μCi/ml)	1.07x10-12	MDA (~1x10-15)

1-4 Identify and describe the electrical and instrumentation and control (I&C) components that are required to:

a. monitor pool water level [10 CFR 72.122(h)(2)],
b. monitor pool water leakage [10 CFR 72.122(h)(2)],
c. provide continuous monitoring of storage confinement systems [10 CFR 72.122(h)(4)]
d. monitor systems that are important to safety [10 CFR 72.122(i)],
e. support criticality monitoring systems [10 CFR 72.124(c)],
f. support radiological alarm systems [10 CFR 72.126(b)], and
g. monitor direct and effluent radiation levels [10 CFR 72.126(c)].

Also, identify any SSCs necessary to physically support or protect the above electrical and I&C components.

SSCs important to safety must be designed to meet the overall requirements of 10 CFR 72.122. The staff review should determine whether the applicant's screening included all necessary SSCs for the renewal period. The SER for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Response - a. The instrument that monitors basin water level (LI-102-51) is a differential pressure (D/P) detector utilizing a D/P transmitter that senses the D/P between the atmosphere above the basin and the pressure on a leg submerged in the basin water. Instrument air is supplied continuously to the submerged leg. The D/P transmitter sends a signal to the Control Room where basin level is indicated on the Main Process Control Panel. An alarm announcer circuit (UA-951A-1-3) provides an alarm in the Control Room if the signal from the D/P transmitter output falls below the set value providing a basin low-level alarm. The SIMS system also monitors the D/P transmitter output, displays a level, and provides a low level alarm. The SIMS is a computer-based system which monitors and records plant parameters. SIMS reading and alarms are continuously displayed in the Control Room and the Central Alarm Station, which is continually manned.

b. The instrument that monitors basin water leakage (LI-102-52) is a differential pressure (D/P) detector utilizing a D/P transmitter that senses the D/P between the atmosphere in the Basin Leak Detection (BLD) sump and the pressure on a submerged leg at the bottom of the BLD sump. Instrument air is supplied continuously to the submerged leg. The D/P transmitter sends a signal to the Control Room where basin level is recorded on the Main Process Control Panel. Level is also indicated in the Basin Pump Room. An alarm announcer circuit (UA-951A-2-3) provides an alarm in the Control Room if the signal from the D/P transmitter rises above the set value providing a BLD high-level alarm. The BLD sump pump out system is controlled by a pressure switch that senses the submerged leg pressure and provides a signal to start and stop the pump and air lift that pump the BLD sump contents through a filter and into the basin. The SIMS system also monitors the D/P transmitter output, displays a level, and provides a high level alarm. The SIMS is a computer-based system which monitors and records plant parameters. SIMS reading and alarms are continuously displayed in the Control Room and the Central Alarm Station, which is continually manned.

c. The basin leak detection system and criticality monitoring system is described in the CSAR.

d. The basin leak detection system for the basin liner.
The basin expansion gate pump out system detects any leaks of basin water into the annulus area of the expansion gate.

e. RIA-930-9 and RIA-930-11 are the criticality detection instruments. They are connected to two separate detectors in different locations in the basin area. These detectors continuously monitor radiation levels in the basin area and when radiation level exceeds a set point, the criticality horns automatically sound.

f. The criticality monitoring system continuously monitors radiation levels in the basin area. Alarms would sound in the control room and on the SIMS system.

g. The stack gas monitoring system (equipment number SP-879) continuously samples the inlet to the sand filter and the takes two independent samples of the stack effluent. An alpha/beta counting unit analyzes these samples. The SIMS monitors flow through the sampling system. Stack flow is also continuously monitored by the SIMS and recorded on a regular basis.

1-5 Indicate whether the GE-MO ISFSI Control Room must be continually staffed during any postulated accident. If so, identify the SSCs that are necessary to maintain control room habitability during an accident and their intended function(s) which cause them to be considered within the scope of license renewal.

Per 10 CFR 72.122U), a control room must be designed to permit occupancy and actions to be taken under normal and off-normal or accident conditions. The SER will demonstrate compliance with 10 CFR 72.122 for the renewal period. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Response - None of the accidents postulated in the GEMO CSAR require continuous manning of the Control Room. While the Control Room is the place where many plant components are operated, it is non-essential to the operation of GE-MO and has been determined to be a non-critical area.

1-6 Identify and describe the intended functions of instruments and air operated valves that use instrument air in the following systems:

a. basin water cooling system,
b. basin water filter system,
c. ventilation exhaust system, and
d. basin leak detection system

This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Response - The GE-MO instrument air system is comprised of a two compressors. The compressors are operated alternately to maintain equal wear, but only one is necessary to provide instrument air.

a. There are no air requirements for the basin chiller system

b. Air controlled valves in the basin filter system are designed to fail either "as is" except for the flow control valve which fails in the open position. If instrument air flow were lost, the basin water filter continues to operate.

c. Instrument air controls the dampers for individual exhaust blowers and stack airflow monitoring. The valves are designed to fail in the open position.

d. The basin leak detection system uses an airlift during sump pump out and the sump level indicator.

1-7 Identify and describe which SSCs (ie., fire detection, alarm, and suppression systems and components (including fire extinguishers) are necessary for ensuring that a credible fire will not have unacceptable consequences on the safety of the ISFSI. Credible fires should include vehicular fires involving equipment used in the transfer of casks, natural gas line breaks, and fires involving stored flammable materials.

Section 4.3.7.2 of the CSAR indicates that fire detection, alarm, and suppression systems and

components (including fire extinguishers) are used at the ISFSI.

Title 10 CFR 72.122(c) states *"Structures, systems, and components important to safety must be designed and located so that they can continue to perform their safety functions effectively under credible fire and explosion exposure conditions."* The SER and EA will demonstrate compliance with 10 CFR 72.122 for the renewal period. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Response – The warehouse/shop is the only building with a fire suppression system. All other buildings with fire potential are monitored by smoke/fire detectors. There is no credible fire potential at GE-MO that could impact fuel storage. Fire extinguishers are located in all areas of GE-MO, including the basin and its support structures. Potential for a credible fire in the basin or its support facilities is very unlikely. No combustible materials are used to construct the basin, the basin building, connected support buildings, or basin support systems. No bulk flammable materials are stored in or around the basins. Additionally, minimal combustible materials are used in these areas. All gas service has been terminated. No support system involved in a fire, such as the stand-by diesel, would prevent the fuel from being safely maintained.

1-8 Identify the portions of the electrical power systems that are necessary to provide emergency power to the SSCs that are not important to safety but whose failure as support SSCs could prevent an important to safety function from being fulfilled.

Response - GE-MO is supplied with 2 electrical feed lines and a back-up diesel generator. The electrical power system that supplies back-up power to SSCs not important to safety is the same system that supplies back-up power to SSCs important to safety, as described in the CSAR. No SSC not important to safety but whose failure as support SSC could prevent an important to safety SSC from functioning has been identified.

1-9 This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA. Also 10 CFR 72.122(k)(3) requires timely and reliable emergency power to specific SSCs.

Describe the process used to demonstrate that the effects of aging are adequately managed such that the intended functions of SSCs subject to AMR are maintained in a manner consistent with the current licensing basis throughout the license renewal period.

The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to evaluate the proposed aging management program for the renewal period and supports the development of the SER and the EA.

Response - While Morris Operation does not have a program specifically titled "Aging Management", operational practices at GE-MO, as discussed above combined with Preventative Maintenance program (described elsewhere) and Compliance and Operability tests (described elsewhere) demonstrate the capability exists to monitor aging management. These practices have been effective in identifying and mitigating aging effects on SSCs. Going forward, GE-MO will develop a site specific Aging Management Program covering the SSCs considered Important to Safety and the

Support Systems.

Based upon review and analysis we feel the processes as defined in *Preliminary Guidance for 10 CFR Part 72 license renewal to Virginia Electric and Power Company's (VEPCO) dry cask ISFSI; NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants; and NUREG-1801, Generic Aging Lessons Learned (GALL) Report* are not directly applicable although the concepts are useful in developing a site specific program. GE-MO will use the references as a guide for developing Aging Management Programs for the SSCs and Support Systems as applicable to Morris Operation.

These management programs in addition to the processes currently in use will provide adequate assurance that the functionality of SSCs at GE-MO will be adequately maintained through the 20 years of the license renewal period.

1-10 Provide copies of appropriate piping and instrumentation diagrams (P&IDs), the drawings listed in Appendix A.14 of the CSAR, and other schematic representations identifying the SSCs, or portions thereof, that are subject to AMR.

Response – Currently there are no SSCs or support systems subject to a formal aging management program. This information will be developed as part of the proposed aging management system. In addition the drawings listed above in Appendix a.14 of the CSAR are in the 15 copies of the CSAR supplied with the submittal.

1-11 The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to determine if all appropriate SSCs have been included within the scope of license renewal review and which will support the staff development of the SER and the EA.

Identify when the high pressure natural gas pipe station was installed at the facility and describe the systems or structures needed to minimize the adverse effects of a natural gas line explosion. Provide the analysis that shows that a gas line explosion will not have an impact on the safe operation of the ISFSI for the license renewal period.

As stated in 10 CFR 72.122(c), SSCs important to safety must be designed and located so that they can continue to perform their safety functions effectively under credible fire and explosion exposure conditions.

Response - The high-pressure gas pipeline was installed during initial construction in 1968. An off site gas valve was installed in 1980 to provide the ability to isolate high-pressure natural gas from the site in the event of a fire/explosion. The valve has been closed by the gas supplier and natural gas is no longer used at GE-MO.

Currently a project is underway to replace the few items that used natural gas with electrical equipment. Estimated completion of this project is fall 2003.

SECTION 2 - AGING EFFECTS FOR IDENTIFIED SSCs

2-1 Identify any age-related degradation that has occurred at the GE-MO ISFSI. Also, identify any cases where the material properties of SSCs subject to an AMR (i.e., within the scope of license renewal) have been altered significantly during the current license period.

Although not required, it is recommended that the GE-MO staff undertake a review of spent fuel pool industry experience with respect to age-related degradation. NUREG1801, *"Generic Aging Lessons Learned (GALL) Report,"* and Appendix C to NUREG1557, *"Summary of Technical Information and Agreements from Nuclear Management and Resources Council Industry Reports Addressing License Renewal"* (see Section C of Ref. 10) may be of assistance in the review.

Response – As described in the CSAR, the original basin fin/fan coolers were replaced with heat pumps in 2000. Additionally, as described previously, the air compressor system, and basin water demineralizer system were also replaced in 1998 and 1996 respectively. These are typical of the major scope aging management projects undertaken within the last 10 years.

2-2 Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. The SER and the EA for the license renewal will require an assessment of AMR for all SSCs relied on in the CSAR. This RAI is necessary for the staff to evaluate the proposed aging management program for the renewal period and supports the development of the SER and EA.

For each of the SSCs subject to AMR, identify the material, environment, and potential aging effects applicable for the SSCs. When identifying potential aging effects, programs or activities that are or will be used to prevent or mitigate an aging effect should not be considered (e.g., implementation of the pool chemistry program should not be considered in determining whether SSCs located in the pool water have aging effects; instead the chemistry program should be credited as an aging management program to mitigate any applicable aging effects).

The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to evaluate the proposed aging management program for the renewal period and supports the development of the SER and the EA.

Response – The answer to this question has been discussed in through many previous questions on the aging management of the SSCs at GE-MO identified as important to safety.

2-3 Provide a copy of the report on the incident of June 1972 that ruptured the basin liner. Include a description of the necessary repairs to restore the basin liner integrity and a discussion of the introduction of any aging effect that might have resulted specifically from the repair.

Title 10 CFR 72.24 requires an application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety. The SER and the EA for the license renewal will be required to present information concerning this incident. This RAI is necessary for the staff to evaluate the proposed aging management program for the renewal period and supports the development of the SER and EA.

Response – As discussed elsewhere, the basin liner rupture was repaired in 1972 using the same materials and techniques as the basin liner was originally constructed of. A caisson was lowered into the unloading pit, sealed to the wall and the repairs were performed dry. This patch has been in place over 30 years and no process, or plan is in place for specialized aging management other than the processes discussed elsewhere for the basin liner.

2-4 Identify whether any of the SSCs subject to AMR have inaccessible areas. Describe how aging effects of the portions of SSCs in inaccessible areas are managed.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This requires AMR in the applicant's CSAR for all SSCs important to safety or supports a SSCs important to safety. Specifically, 10 CFR 72.24(a) requires the safety assessment to *"...contain an analysis and evaluation of the major structures, systems, and components of the ISFSI ... that bear on the suitability of the site when the ISFSI ... is operated at its design capacity."* This will also support the development of the SER and the EA.

Response – The basket support grid, baskets and basin floor are inaccessible to a meaningful inspection program. As discussed in Section 1.0, while these items are inaccessible, their primary means of failure could be assumed to be through corrosion. Using the coupon taken from the basin liner (all materials are 304 stainless steel) discussed in 2-5 its specific supporting report, corrosion is minimal and should have little or no impact on these items for the term of the license renewal.

2-5 Provide information on the types, locations, and results of inspections of the basin liner and liner welds for indications of galvanic or other types of corrosion or cracking on the liner or liner welds. For example, provide a copy of report GENE 689-013-0893 "Morris Fuel Recovery Center Fuel Storage Basin Liner Visual Examination Summary Report," dated September 1993, and the inspection plan used to perform the examination.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response - Included are copies of;
Morris Fuel Recovery Center Fuel Storage Basin Liner Visual Examination Summary Report, dated September 1993
Morris Fuel Recovery Center Fuel Storage Basin Liner Metallurgical Evaluation, dated May 1994.

2-6 Describe the impacts of aging on the spent fuel and fuel cladding and justify that, during the entire license renewal period, the fuel can be retrieved, packaged and shipped offsite without environmental risk or risk to operations personnel.

The references in the CSAR on the effects of aging on fuel cladding are from 1977 and are based on spent fuel stored for only 9 years. If renewed, some of the fuel currently in storage could remain at the GE-MO ISFSI for over 50 years (The first bundle of fuel was received on January 13, 1972).

The SER and the EA for the license renewal will require an assessment of the AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to evaluate the proposed

aging management program for the renewal period and supports the development of the SER and the EA.

Response – There is no information to accurately predict the condition of the fuel cladding after being in the basin for the postulated 50 years. However, it is known that water quality does have a direct bearing on fuel cladding. The basin water quality at GE-MO is maintained with a high degree of purity and within a tight temperature band.

2-7 Justify the heat loads used for the license renewal application by providing the burnup and cooling time of the current fuel inventory prior to it being placed in storage at the GE-MO ISFSI and demonstrating that the condition of the fuel currently in storage are within the fuel exposures and cooling times of Table 4-2.

Table 4-2 of the CSAR indicates that many of the safety analyses were performed at fuel exposures of 24,000 MWd/TeU (although the Technical Specifications allow fuel exposures up to 44,000 MWd/TeU). Additionally, Section 4.1.1 of the CSAR states, *"Heat load calculations for basin water temperature and evaporation rates, basin water cooler design, and ventilation air cooling design are based on heat loads from fuel currently in storage and that expected to be stored."*

Title 10 CFR 72.122 provides overall requirements for the safe and continued operation of SSCs during routine and emergency conditions. Consideration of the heat loads used in the license renewal application supports the staff development of the SER and EA.

Response - All fuel shipped to Morris Operation was required to cool for a minimum of one year. The safety analysis performed were for this minimum 1 year up to and including actual cooling time in excess of 1 year prior to receipt. All fuel approved for storage and received at Morris met the GE-MO license requirements. The fuel currently in storage started to arrive in January 1972 and the last was received in January 1989 so it has been here a minimum of 15 years with most fuel in excess of 20 years. All fuel currently in inventory is within Table 4-2.

2-8 Provide a history of the leak rate of the basin liner. Section 5.5.1 of the CSAR states, *"The stainless steel liner can be expected to have a useful life of more than 100 years because of the non-aggressive service environment"* Also, Section A.8 of the CSAR notes that, based on 1993 examination results, continued long-term service of the basin liner is indicated. Justify the assertions contained in the CSAR, especially in light of the fact that the liner currently allows some pool water to flow into the basin leak detection system.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response - Basin Leak Detection System Pump outs (Units: Average Liters/Day/Quarter)

Year	1st quarter	2nd quarter	3rd quarter	4th quarter
1980	0.79	0.81	0.78	0.84
1981	0.60	0.73	0.79	0.76
1982	0.66	0.52	0.61	1.01
1983	0.04	0.10	0.12	0.03

1984	0.17	0.23	0.15	0.02
1985	0.06	0.08	0.06	0.01
1986	0.44	0.13	0.00	0.04
1987	0.03	0.12	0.04	0.11
1988	0.24	0.24	0.23	0.24
1989	0.15	0.10	0.17	0.16
1990	0.15	0.16	0.21	0.17
1991	0.09	0.18	0.14	0.15
1992	0.15	0.16	0.11	0.13
1993	0.13	*	*	*
1994	*	51.1	78.0	60.1
1995	45.0	32.3	28.3	14.7
1996	14.2	14.2	38.3	709.7
1997	595.3	553.3	535.0	543.0
1998	527.7	505.7	559.3	656.3
1999	803.8	792.4	695.3	699.0
2000	696.5	680.1	747.0	731.8
2001	673.8	668.8	672.5	637.2
2002	570.3	527.4	528.7	502.2
2003	537.5	509.8		

*** LDS flow rate evaluation and sump maintenance. Data prior to 1994 is suspect. Through 1993, there was little or no flow in the LDS. In 1993, it was discovered that the orifice to the LDS was blocked. A project was undertaken to examine and fix the system.**

As can be seen from the above table, the basin has continually had some degree of leakage to the LDS, except for the period of 1993 to 1994 when the sump orifice was blocked.

2-9 Provide justification and a reference for the statement in Section 5.5.1 of the CSAR which states, *"Reinforced concrete in basin walls and floors is estimated to have a useful life of more than 100 years."*

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – The basin concrete structure is described in 5.5.1.2 along with the construction specifications. Additionally, the concrete structures at GE-MO were designed and constructed in accordance with the applicable national standards and meet conditions consistent with longevity as described by the GALL report. While it may not be possible to state the expected life of the concrete exactly, the existing conditions avoid the degradation mechanisms that would adversely affect the structural integrity of the concrete. As maintenance of these conditions will be incorporated into the proposed Aging Management Program those structures should remain sound through the period sought by the license renewal.

2-10 Indicate which components of the cranes and lifting/handling equipment are subject to AMR or

justify why they should not be subject to AMR (e.g., show that the results of fuel lifts and drops are acceptable without taking credit for the components). Include in your response identification and description of the measures taken, or components of the cranes and lifting/handling equipment used to:

a. Prevent a fuel bundle or storage basket from being lifted to an elevation where the uppermost part of a fuel bundle is less that 9 feet below the surface of the basin water;

b. Ensure that the bottom of the fuel bundle or storage basket is no more than 3 feet above the basin floor;

c. Ensure that components handled by the cranes are not dropped or tipped over; and

d. Ensure that the cranes do not fall onto the spent fuel.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – a. The mechanisms on the cranes that prevent a fuel bundle or basket from being lifted in violation of water or distance requirements are the fixed lengths of the fuel/basket grapples. The grapples attach to a crane hook/cable. The fixed length of the grapple then works with the crane limit travel stops to prevent fuel/baskets from being lifted outside the required dimensions.

b. See a. above.

c. The unloading pit doorway guard is used to protect a basket in case it is tipped as it enters the basin from the unloading pit. It is described in Section 1.0. The doorway guard is a component that is only used during fuel movement into or out of the unloading pit. This hasn't occurred since 1989. Prior to fuel movement, as part of the proposed Aging Management Program, the doorway guard will be inspected and tested to assure its ability to provide the service it was intended for.

d. All cranes are equipped with seismic restraints to prevent the crane wheels from disengaging from the track and allowing the crane to fall.

2-11 Provide the material safety data sheet (MSDS) for Electrofilm. Describe the potential impacts on the seismic and thermal load analysis of the basin grid and walls if the lubricant degrades over time. Identify the aging effects of Electrofilm in an oxygenated water environment Describe the potential for, and GE-MO's plans and proposed actions, should the fuel basket latches not release because of galling, corrosion, or other failure mechanism. Section 5.4.4.2 of the CSAR states, "a solid film lubricant (Electrofilm) was used on wedges to reduce the coefficient of friction between grid and wall to accommodate thermal and seismic movement"

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response - Attached is the MSDS for Lube-Lok 4396 by Morgan Advanced Ceramics, Everlube Products Division. This company purchased the company that made Electrofilm 4396,

and it is now known as Lube-Lok 4396. The lube is a baked on ceramic coating with a wear life in excess of 300,000 cycles.

The potential for the basket latches not releasing due to galling, corrosion or other failure is considered minimal. The latches were only operated when the baskets were installed in the basin. There is no plan in place as to action to be taken if, for some unforeseen reason, the latches don't release. If this occurred it would be a condition that would be evaluated at that time.

2-12 Provide a copy of report GENE-689-003-0494, *"Morris Fuel Recovery Center Fuel Storage Basin Liner Metallurgical Evaluation,"* dated May 1994. Provide a discussion on the following:

a. Why the corrosion rate for the coupon cut from the basin liner in the cask unloading pit discussed in Appendix A.8 of the CSAR is representative of the rest of the liner and other stainless steel components in the pool;

b. Why the rate should be assumed to remain constant throughout the license renewal period;

c. Provide a description of the method and materials used to repair the basin wall after the coupon was removed;

d. Describe whether there may be parts of the pool liner or other pool components that may be subjected to a different environment than that to which the coupon was exposed (e.g., are there any stagnant, hot, or cold regions in the pool?);

e. Describe the pool chemistry history to which the coupon was exposed; and

f. Describe whether the corrosion rate would differ if the pool chemistry was maintained at the chemistry limits specified in Technical Specification 4.5.1.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – A copy of report GENE-689-003-0494 was supplied in accordance with question 2-5.

a. All stainless steel components in the basin are constructed of 304 stainless stell and are exposed to the same environment.

b. The quality of the basin water is the primary element affecting the stainless steel components. As discussed elsewhere, the basin water quality is maintained with very low conductivity indicating a lack of corrosion products. All components in the basin are in a static mode, with no movement since January 1989 with the last fuel receipt.

c. The basin wall was repaired by welding a 304 stainless patch over the coupon location using 308L weld filler metal as discussed elsewhere.

d. The unloading pit where the coupon was removed is the area of lowest flow in the basin, since it is the deepest.

e. Basin water chemistry is described elsewhere.

f. The basin water chemistry is in compliance with Technical Specification 4.5.1. The basin water chemistry listed was applicable demineralized water being produced using chemical treatment and to receipt criteria for fuel/casks. The demineralizer system installed in 1996, uses only resin beds and no chemical treatment. There are

no sources of $NaNo_3$ or Cl in the basin, and as can be seen in the water quality results elsewhere, they are continuously below minimal detectability.

2-13 Provide the following information on the stainless steel basin liner:

a. Provide the chemical composition of the Type 304L stainless steel used to line the basin.

b. Provide the type of filler metal and weld rod used to weld the Type 304L stainless steel liner.

c. Describe the repair process and material used to repair the liner rupture and replace the sample coupon.

d. Justify why the corrosion rates for the filler metal and weld rod are equivalent to the corrosion rate found on the sample coupon.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – a. The 304L used to line the basin was ASTM A-240

b. The basin liner was welded with E-308L complying with AWS A5.4-62 for covered electrodes.

c. The liner rupture was welded through the use of a caisson that was lowered into the unloading pit and sealed against the unloading pit wall. Welding was performed dry and filler metal was E-308L. The sample coupon, taken several years later, out of the unloading pit, was replaced underwater by divers using underwater welding techniques and E-308L covered electrode complying with SFA 5.4. The coupon material is 304L per ASTM A-240.

d. The filler metal used to repair the liner (E-308L) in both instances is an industry recognized weld filler material for 304 stainless steel as it supplies the same corrosion resistance in the as welded condition as the 304 and is the same material specified for the original welding of the basin liner.

2-14 Discuss the potential for stainless steel components, such as the fuel baskets and supporting grids, located in the GE Morris Operations ISFSI spent fuel pool to crack or have a loss of material. Note that Chapter VII, Section A.2, Spent Fuel Storage, of NUREG-1801, *"Generic Aging Lessons Learned (GALL) Report, Volume* 2', dated April 2001 (Ref. 10), indicates that stainless steel storage racks in a chemically treated oxygenated water are subject to crack initiation and growth due to stress corrosion cracking. Also Chapter VII, Section A.4, *"Spent Fuel Pool Cooling and Cleanup',* indicates that stainless steel piping, fitting, and flanges are subject to loss of material due to pitting and crevice corrosion.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – The basin water at GE-MO is filtered, but not chemically treated. The basin liner was visually inspected (report submitted in 2-5) in 1993, and there were no indications of evidence of structural or environmentally induced degradation including no evidence of a MIC induced condition.

2-15 Provide the surveillance programs and procedures to identify the spent fuel bundles containing defective fuel rods or fuel assemblies with small cladding defects. Describe the methods used to contain escaping fission products (gaseous or dissolved) from degraded or damaged fuel. Please justify the appropriate references relating to the chemical inertness of fuel pellets in water.

Section 5.3.2.2 of the CSAR states *"Special vent hoods can be used for... defective fuel rods to collect escaping gas..."* Section 5.4.4.1 of the CSAR states "... *the effects of small cladding defects in individual fuel rods is relatively minor due to chemical inertness of fuel pellets in water ..."*

Title 10 CFR 72.24 requires an application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety and supports the development of the SER and EA. Both 10 CFR 72.122 (h)(1) and 72.122(1) seek to ensure safe spent fuel storage and handling and to minimize post-operational safety problems with respect to retrievability of the fuel from the storage system.

Response - There are no defective fuel bundles at GE-MO. After over 20 years of experience of spent fuel storage in ultrapure water, the fuel has not shown any indications of leakage. The fuel bundles in the basin are not moved so no stresses from handling have been put on them since being installed in the basin. It is felt that if a fuel bundle did begin to leak, it would be a slow leakage and not a catastrophic leak due to cladding failure. The basin ventilation system is more than adequate to handle any escaping gasses until a plan can be put into place to deal with the condition.

2-16 Identify any defective fuel currently in storage at GE-MO and describe special monitoring efforts (if any) used to monitor the condition of the defective fuel. Section 5.3.2.2 of the GE-MO CSAR states, *"known defective fuel is not normally accepted for storage by GE-MO."* However, page 14 of the Environmental Impact Appraisal for increasing the storage capacity of the Tennessee Valley Authority's Browns Ferry Nuclear Plants dated September 21, 1978 states, *"Operators at several reactors have discharged, stored, and/or shipped relatively large numbers of Zircaloy-clad fuel which developed defects during reactor exposures, e.g., Ginna, Oyster Creek, Nine Mile Point, and Dresden Unit 1 and 2. Several hundred Zircaloy-clad assemblies which developed one or more defects in-reactor are stored in the GE-Morris pool without need for isolation in special cans."* There is no mention of these defects in the GE-MO CSAR or of the effects from long-term storage for the renewal period.

Title 10 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety. Title 10 CFR 72.122 (h)(1) and 72.122(1) seek to ensure safe spent fuel storage and handling and to minimize post-operational safety problems with respect to retrievability of the fuel from the storage system.

Response - There is not now, nor was any defective fuel ever received at GE-MO. Regardless of the statements made by Browns Ferry, the fuel that was received at GE-MO from Dresden

was due to burn up rate, not damage. GE-MO fuel receiving procedures required all fuel casks being received to be tested for damaged/leaking fuel bundles. If any were found, the cask would be returned to the shipping utility.

2-17 Identify and describe the components of the ventilation exhaust system (e.g., air tunnel, fans, duct work, sand filter, stack) and their intended functions that are required to maintain normal and accident doses below the limits in 10 CFR 72.104 and 10 CFR 72.106 and which if any of these SSCs would be considered within the scope of license renewal and therefore subject to AMR. Describe the mechanism (e.g., screen) used to prevent debris from entering and clogging the stack. Based on the above information, describe the aging management program(s) necessary to maintain the noted intended function(s) for the license renewal period.

Note that, with the exception of the tornado-generated missile accident, the accident analyses in Section 8 of the CSAR appear to assume that all of the released radionuclides are expelled from the basin, passed through the sand filter, and released from the main stack. Any justification for not subjecting this structure and system to an AMR should include providing dose results for the accident scenarios evaluated in Section 8 of the CSAR using the assumption that the storage basin is open to the atmosphere.

Title 10 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response - The ventilation exhaust system is not required to maintain normal and accident doses below the limits in 10 CFR 72.104 and 10 CFR 72.106. Stack clogging would be very unlikely due to the physical construction of the system, and there is no screen in place to prevent clogging, however, there is a alternate port that can be used to either clean the stack, have a ground level release point, or erect a temporary stack.

This chart shows modified calculations for all accidents in section 8 of the CSAR that calculate exposures to the public. These are calculated using the Off Site Dose Calculation Manual for the GE Morris Operation using the most restrictive X/Q values for a ground level emergency release.

Activity Released (Ci)

	Missile Accident		Fuel Basket Drop		Fuel Bundle Drop	
	BWR	PWR	BWR	PWR	BWR	PWR
Noble Gas	2500	3700	6156	6120	684	1530
Iodine	1.20E-06	1.80E-06	3.01E-06	2.99E-06	3.30E-07	4.80E-08

Estimated Dose (mR)

Whole Body	**0.81**	**1.20**	**2.00**	**1.99**	**0.22**	**0.50**
Thyroid	**5.23E-05**	**7.84E-05**	**1.31E-04**	**1.30E-04**	**1.44E-05**	**2.09E-06**

Calculations From Offsite Dose Calculation Manual

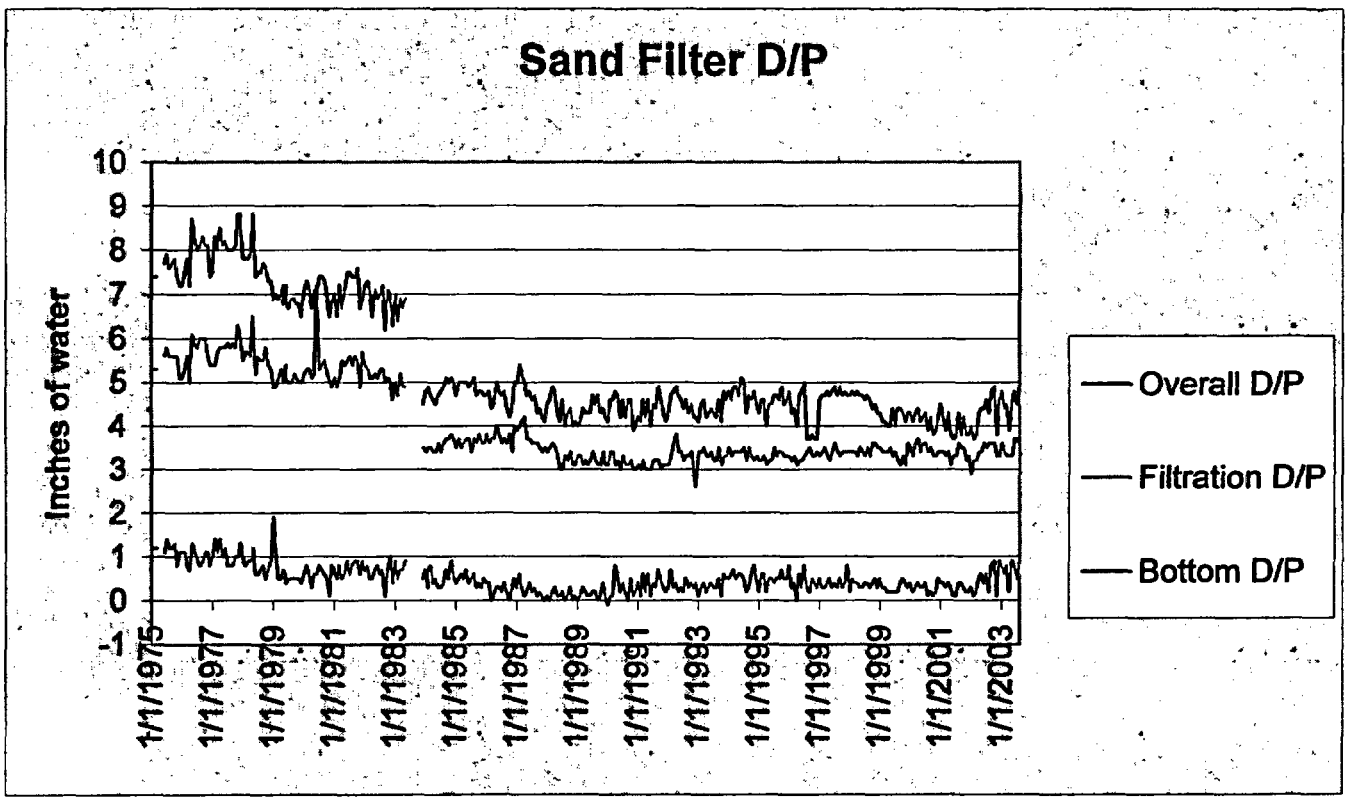
Deep dose from Kr-85	3.17E-05 X/Q Ci	1.12E+01 =	
CEDE from I-129	2.64E+02 X/Q Ci	0.18 =	
X/Q value	**9.17E-04**		

Attached is a report using the EPA COMPLY program for an unfiltered ground level discharge based on the samples taken for 2002. This dose is still significantly below the 10 CFR limits.

2-18 Describe how the radionuclide removal rate of the deep-bed sand filter and the flow through the filter varies over time. What is the impact of the additional license period on the performance and operation of the sand filter? Identify and describe the structures and structural components (e.g., sealants) that form the basin enclosure confinement boundary.

Age related degradation for the renewal period should include consideration of the requirements in 10 CFR 72.24 and 72.122. This information will support the development of the SER and the EA.

Response – The deep-bed sand filter flow since 1975 is shown in the following chart:



Until 1983 the ventilation system was configured to operate as originally designed for a fuel reprocessing plant. The D/P readings were taken at 24,000 CFM flowing through the filter. The break in the data during 1983 is when the ventilation system was re-configured to operate as it does today. The data after the break to present was taken at 14,000 CFM flowing through the filter. As you can see, the D/P for the given flow has stayed effectively constant over the almost 20 years since its modification. The amount of activity deposited into the filter is less than .01 µCi per year based on sample data. The effectiveness of the filter will not be affected during the additional license period. There is the piping in place for an additional air filter to tie into our system should one be necessary.

The basin enclosure consists of the following:

- **The main structure surrounding the basin area is a steel framed structure that has a steel shell.**
- **The process building makes up most of the east side of the enclosure and the Cask Receiving Area is adjacent to the north side of the building.**

The structural components of the basin enclosure are concrete and steel. The roofs of the enclosure are steel sealed with commercially available roof sealers and membrane covered.

2-19 Demonstrate that the maximum stresses for the basin structure components still maintain adequate safety margins, considering material properties degradation and use of the most recent site seismic and geologic data, when the components are subject to a postulated design base earthquake. The maximum stresses for the basin structure components under the governing load combinations including accident conditions such as seismic load are provided in Section 4.2.5 of the CSAR.

This information is required for the staff to assess compliance with 10 CFR 72.24(d), 72.122(b)(2).

Response – Based on analysis of the concrete and its compliance with the requirements of the GALL report for construction and aging, the fact that the basin was poured directly against bedrock, and recognizing there hasn't been any seismic or geological changes in the GE-MO location, the original safety analysis are considered to remain applicable. Stainless steel components also exhibit insignificant deterioration due to aging.

2-20 Demonstrate, considering age related degradation of material properties, that the basin structure components (liners, concrete elements etc.) still maintain adequate safety margins under a tornado missile impact accident. Section A.15.6.2 of the CSAR discusses "Effects of Missile Impact on Basin Structures". Penetration depths are provided for different missiles and by different methods. The demonstration should utilize the same methods and choice of missile objects as outlined in original analyses.

This information is required for the staff to assess compliance with 10 CFR 72.122(b)(2).

Response – Based on evaluations of the basin structure components discussed earlier, there would be no reason to expect that the safety margins established in the CSAR are not currently applicable.

SECTION 3 - MONITORING AND MAINTENANCE PROGRAMS

3-1 Describe the programs or activities used to review and manage the effects of aging. Please include the following information in your response:

a. the specific SSCs for each program subject to an AMR;
b. how the program or activity prevents or mitigates the aging effect;
c. the parameters to be monitored or inspected;
d. how the aging effect is detected before the intended function(s) of the SSCs is lost; e. the criteria to be used to determine whether corrective actions must be implemented;
f. the corrective actions to be taken if the criteria are not met;
g. the confirmation process that ensures that the corrective action was taken and was effective;
h. the administrative controls for maintaining the program or activity; and
i the operating experience of the program or activity, including past corrective actions resulting in program or activity enhancements.

Management and consideration of age-related degradation for the renewal period should consider the requirements of 10 CFR 72.24 and 72.122.

Response - Operating equipment at GE-MO is monitored and maintained through a combination of a Preventive Maintenance Program covering all plant equipment and detailed GE-MO Standard Operating Procedures that include Compliance and Operability Tests for equipment determined to be essential to safe operation of GE-MO. Attached are copies of the GE-MO PM program and Standard Operating Procedures. Specific items are discussed throughout this section.

i. Through the GE-MO PM program and Compliance and Operability tests, the decision was made in 1999 to replace the basin water coolers with a new system. All piping, pumps, and chillers were replaced as a result in 2000.

3-2 For each SSCs subject to AMR that has a potential aging effect, identify the existing or new program or activity or combination of programs or activities that will be used to manage the aging effect (e.g., preventive maintenance program, pool water chemistry program).

The SER and the EA for the license renewal will require an assessment of AMR for all SSCs relied on in the applicant's CSAR. This RAI is necessary for the staff to evaluate the proposed aging management program for the renewal period and supports the development of the SER and the EA.

Response – As was discussed elsewhere, aging management is practiced at GE-MO for SSCs important to safety and not important to safety. All SSCs are Covered under specific PM and Operability Test Programs to adequately meet aging management. However, GE-MO is developing a site specific Aging Management Program covering the SSCs considered Important to Safety and the Support Systems, combining the current preventative maintenance and operability tests. It will also include new processes such as:

1. **For concrete structures exposed to groundwater – a groundwater sampling program to verify pH, chlorides and sulfates in groundwater per the GALL report for below-grade exterior reinforced concrete such as basemat and embedded walls.**
2. **A visual inspection procedure will be developed for exposed concrete structures,**

such as the filter cell.

3. **A formalized process for reporting basin LDS pump out results.**
4. **A formalized process for reporting discrepancies encountered during PMs.**

3-3 Identify and describe the surveillance or inspection program used to verify the continued operability of the emergency power and electrical power systems necessary to provide emergency power and to manage the effects of aging on those SSCs within the scope of license renewal.

Title 10 CFR 72.122(k)(3) requires timely and reliable emergency power to specific SSCs.

Response - GE-MO normal electrical power is supplied as stated the CSAR Section 5.8.2. In addition, there is a 400kVA diesel driven standby generator as described in CSAR Section 5.8.2.2. The diesel and switchgear are covered in specific PM requirements and in addition, the following SOPs, 14-4, Emergency Diesel Generator Operation; 16-90, Emergency Generator – Operability Test; 16-91, Emergency Generator Sequencing – Operability Test, 16-95, 24V DC Load – Operability Test. Certified contractors also inspect the diesel and switchgear.

3-4 Describe how corrective actions, the verification process (i.e., ensuring that preventive actions are adequate and that appropriate corrective actions have been completed and are effective), and administrative controls associated with managing the aging of SSCs that are not important to safety but that are subject to AMR will be controlled (e.g., will the 10 CFR 72, Subpart G, QA program be applied to these SSCs that are not important to safety).

Response – As described earlier, there are no SSCs not important to safety required to be subject to an AMR. However, the GE-MO QA Plan and MOI-431 established functional classifications for all equipment on site. Per the MOI, equipment is separated into the following functional classes and quality requirements defined:
FC-1 – Basic component 10CFR21 applies. Failure could create a substantial safety hazard.
FC-2 – Failure could create potential for abnormal radiation conditions or reduced safety margins.
FC-3 – No nuclear risk, but failure could result in plant shutdown or non-nuclear hazard.
FC-4 – Failure would have negligible effect on operating continuity or safety.

3-5 Describe the inspection and surveillance program(s), per consistent with your response to RAI 3-1, used to monitor the effects of aging on the electrical and instrumentation and control (I&C) components required to:

a. monitor pool water level [10 CFR 72.122(h)(2)],
b. monitor pool water leakage [10 CFR 72.122(h)(2)],
c. provide continuous monitoring of storage confinement systems [10 CFR 72.122(h)(4)]
d. monitor systems that are important to safety [10 CFR 72.122(i)],
e. support criticality monitoring systems [10 CFR 72.124(c)],
f. support radiological alarm systems [10 CFR 72.126(b)], and
g. monitor direct and effluent radiation levels [10 CFR 72.126(c)].

Management and consideration of age-related degradation for the renewal period should consider the requirements of 10 CFR 72.24 and 72.122.

Response –

a. PM systems include test/calibration of the basin water level detector system. Low and high level alarm indications are on the GE-MO Site Instrumentation Monitoring System (SIMS). In addition, SOP 1-22, Basin Cooler System contains requirements for operator verification of basin water level.

b. See 3-6 k.

c. Detailed in PM system and specific SOPs and as described elsewhere herein.

d. Detailed in PM system and specific SOPs and as described elsewhere herein.

e. Detailed in PM system and SOP 16-97, Criticality Alarms Operability – Compliance Test, and as described elsewhere herein.

f. Detailed in PM system and SOP 16-97, Criticality Alarms Operability – Compliance Test; 16-98, ARM Calibration – Compliance Test, and as described elsewhere herein.

g. Detailed in PM system and SOP 16-84, Exhaust Sample Analysis – Compliance Test; 16-85 Exhaust Sampler Calibration – Compliance Test; 16-100 Effluent Water Analysis – Compliance Test; 16-101, Routine Process Stream Samples – Operability Test.

3-6 In order for the staff to adequately review the license renewal application under 10 CFR Part 72, provide a summary of the maintenance and operational history of those SSCs subject to an AMR. Address the following SSCs:

a. spent fuel and spent fuel cladding,
b. fuel baskets,
c. supporting grid structure,
d. basin floor liner,
e. unloading pit energy absorbing pad,
f. unloading pit load distribution plates,
g. concrete basin walls and floor,
h. cask-handling crane,
i fuel-handling crane,
j. basin crane,
k. basin leak detection system,
l. basin water cooling system,
m. basin water filter system,
n. unloading pit doorway guard,
o. filter cell structure,
p. exhaust stack, and
q. water sphere and related distribution system.

Management and consideration of age-related degradation for the renewal period should consider the requirements of 10 CFR 72.24 and 72.122.

Response – a. – The fuel is monitored through gas emissions. There have been no leaking fuel bundles detected.

b. The fuel baskets haven't been moved since they were placed in the basin, and as

discussed previously, there is no reason to expect deterioration of the baskets.

c. Support grid structure is also a static device, and as discussed previously, there is no reason to expect deterioration of the grid.

d. The basin floor liner is not accessible, but as discussed earlier with the coupon removed from the basin wall, there is no reason to expect deterioration of the floor in excess of the wall.

e. The unloading pit energy absorbing pad was designed and sized for an IF-300 shipping cask. Any heavier cask would require a new pad.

f. The unloading pit energy absorption plates are beneath the pit liner. There is no access to the plates.

g. The concrete of the basin walls and floors has no maintenance history. As discussed earlier though, the concrete meets the requirements of the GALL report and the environment of the concrete is not expected to accelerate degredation.

h. The cask handling crane is discussed in Section 1.0. It receives normal preventative maintenance per the PM program and routine inspections.

i. Fuel handling crane receives normal preventative maintenance per the PM program and is routinely inspected. It is equipped with seismic restraints to prevent it from jumping its tracks. The crane has no unusual or significant maintenancehistory.

j. The basin crane receives normal preventative maintenance and has no significant maintenance issues. It is equipped with seismic restraints on the wheels. In response to 9-11-01, the crane hoist has been locked out.

k. The basin leak detection system has been discussed thoroughly elsewhere. Except for the period when the orifice was plugged, there hasn't been a maintenance issue with the system. In addition, after the incident with the orifice, an operability test "SOP 16-16, Basin Leak Detection System Operability Test" was developed and put into place. This test is performer quarterly and verifies that water is being transmitted by the LDS from anywhere in the basin to the LDS sump.

l. The basin water cooling system was installed in 2000 is covered under the PM program. Additionally, a commercial contractor inspects the heat pumps annually. There has been no significant maintenance issues with this system.

m. The basin water filter system, is a simple resin based filter. It is monitored for D/P, and when required, the filter is backflushed and rebuilt.

n. The unloading pit doorway guard hasn't been used since 1989 when the last fuel was received. It serves no function unless fuel is being moved from the unloading pit to the basin. As part of the proposed Aging Management Program, this device will be thoroughly inspected and evaluated prior to use.

o. The filter cell structure, as discussed earlier is only the concrete cell surrounding the filter. There have been no signs of the concrete degrading and the structure meets the requirements of the GALL report.

p. The exhaust stack is inspected by a nationally recognized contractor to industry standards. During the last inspection, no problem areas were identified.

q. The water sphere is inspected by a nationally recognized contractor to industry standards. During the last inspection, no defects were identified. Additionally, a cathodic protection system is included that is inspected yearly by a contractor. There have been no significant maintenance issues with the water supply system.

3-7 Provide the operating specifications and surveillance requirements for basin water turbidity, temperature, and cooling water flow rates for Section 4, "Surveillance Requirements," of Chapter 10 of the CSAR;

Title 10 CFR 72.24 requires an application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response - Basin water is monitored through SOP 16-10, Basin Water Analysis. Basin water quality is described in CSAR Section 5.5.2. Basin cooling water flow rate is per SOP 1-22, Basin Cooler System. The system has a computer that maintains basin water temperature at 77 degrees plus or minus 1.5 degrees. It does this by selectively adding or decreasing the number of chiller units on line. Water flow is set constant at approximately 240 gpm.

3-8 Provide the surveillance requirements for the demineralized water supply used for basin water make-up.

Title 10 CFR 72.24 requires an application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response - Demineralized water used for basin makeup is sampled monthly to the same criteria specified for basin water, except for radiological. In addition, the system that filters the water is computer controlled and self-monitoring. When water quality exceeds a preset level the system supplies a local alarm at GE-MO and automatically notifies Crossbow Industrial Water Systems (formerly Culligan) and they deliver new filter beds. Included for reference is the past 12 months of demineralized water results.

3-9 Outline the aging management program, consistent with your response to RAI 3-1, for the basin structure concrete elements. Reinforced concrete structures when subjected to operational and environmental conditions and loads, may degrade over time. Le. concrete may crack and lose materials, steel may corrode. Consider in your response the following American Concrete Institute (ACI) standards regarding concrete degradation; ACI 224.1 R "Causes, Evaluation and Repairs of Cracks in Concrete Structures, ACI 349.3R "Evaluation of Existing Nuclear Safety-Related Concrete Structures", and ACI 222R "Corrosion of Metals in Concrete."

This information is necessary for the staff to assess consistency with NUREG-1801 XLS6, "Structures Monitoring Program." Additionally, 10 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response – Aging management for concrete structures was discussed previously. The concrete structures at GE-MO were designed and constructed in accordance with the applicable national standards and meet conditions consistent with longevity as described by the GALL report.

SECTION 4 - ENVIRONMENTAL CHANGES

4-1 Justify the use of the X/Q (Chi over Q) value of 4.0x1 0-4 sec/m3 in Assumption (h) of Section 8.6.2 for a short-term ground-level release.

The X/Q value is taken from Table A.5-3. However, Table A.5-3 is used to calculate the ground deposition values from a precipitation washout of stack discharge, which is only one component of the radiation exposure that would result from a ground-level release as discussed in Section 3 of Appendix AA. The additional exposure assessments do not appear to have been addressed. Also, provide the source information for the meteorological conditions given in Appendix A.5 and document that they are applicable to the GE-MO site.

Title 10 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response - As specified in Appendix A.5, COMPLY, a computerized screening tool for evaluating radiation exposure from atmospheric releases of radionuclides is used for radionuclide emissions. The COMPLY code may be used for demonstrating compliance with EPA and Nuclear Regulatory Commission regulations. See attached Report on Compliance with the Clean Air Act Limits for Radionuclide Emissions from the Comply Code, Version 1.5d

4-2 Update, or provide documentation to verify the following information is still accurate and current:

a. Table 3-4 Aircraft flight information is from 1979;
b. Table 3-6 Precipitation information is from 1964;
c. Figure 3-8 Wind rose data is from 1971;
d. Figures 3-3, 3-4, 3-5, and 3-6 Population Data is from 1990;
e. Table 3-7 Thunderstorm activity information is from 1976;
f. Table 3-8 Stability class and wind direction information is from 1974;
g. Table 3-12 Water analysis information is from 1977; and
h. Figure 7-1 History of Basin Water Activity ends in 1994.

Additionally, provide updated historical information on tornado activities in the vicinity of the GE-MO facility.

This information is needed to support staff development of the EA.

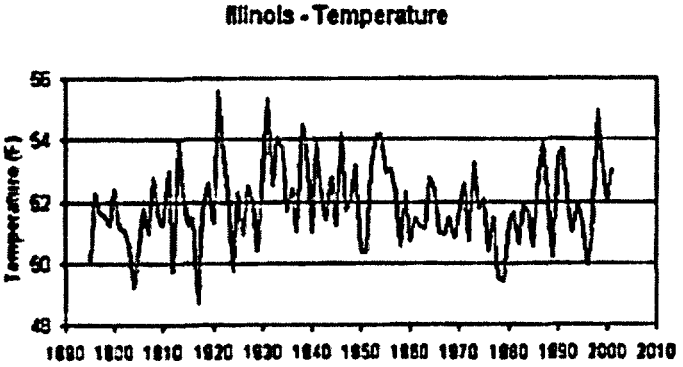
Response – a. The aircraft flight data in Table 3-4 is referenced to VOR flight tracking. As per FAA regional office, since flights use GPS now, this system is no longer used and an update of the info is not possible. The information was retained in the CSAR to depict there are no scheduled flight lanes over GE-MO.

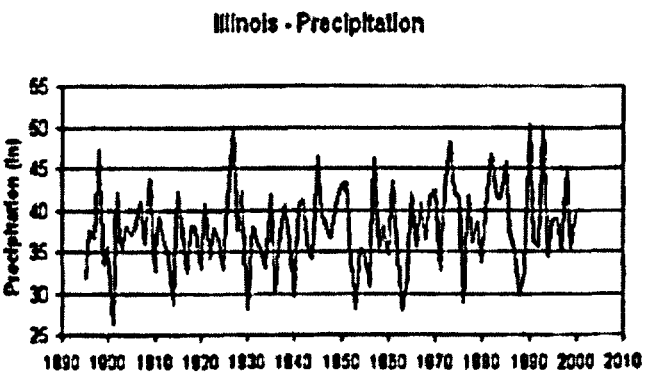
b. Table 3-6 has been updated to include information from 1948 through 2001.

c. See 4-2 f.

d. Figures 3-3, 3-4, 3-5 and 3-6 are used to demonstrate anticipated population growth for the period 1990 to 2015. Table 3-1 has been revised to the 2000 US Census results.

e. The CSAR does not try to document/track weather changes on a year-by-year basis. Weather variations due to atmospheric changes occur continually, however, historically weather in the location of GE-MO has not had a historical reversal or change. The information in Table 3-7 is used as a representative sample to compare 6 specific years to a 33-year average. While weather patterns may vary year to year, there hasn't been a dramatic shift in climate in Illinois in 100 years as demonstrated by the charts below.





f. The CSAR does not try to document wind changes year by year. Wind speed and direction variations due to atmospheric changes occur on a year-by-year basis, however, generally, over a period of time, wind direction and speed does not have a permanent change. As stated in CSAR 3.4.3.2, a detailed study of wind direction information was taken at Dresden NPP from 1971 through 1974, and then 1974 was selected as a representative sample.

g. Table 3-12 refers to a study of groundwater done in 1977 for a potential expansion of GE-MO. This expansion was not used and there are no current or foreseen plans to expand GE-MO.

h. CSAR Figure 7-1 revised to include current data.

4-3 Provide verification that the GE-MO facility is safe from flood damage in the event of a record flood in the Morris, Illinois area. Per Section 4.2.3.2 and Appendix A.6 of the CSAR, the potential flood evaluation is based on a 1970 study. Changing weather patterns in recent years have subjected much of the mid-western USA to both 100-year and 500-year record flooding.

This information is needed to support staff development of the EA.

Response - As stated in the CSAR, Section 3, paragraph 3.5.1.1, and Appendix A.6, potential flooding of the site is very unlikely. Site elevation at the plant location is higher than 532 ft. The normal pool elevation above the Dresden Island Dam is 505 feet

4-4 Provide water use requirements (gallons/day) for both pool make-up water and sanitary uses and the maximum output capacity of the well. Water for the fuel storage basin, closed loop basin filter and cooling systems, and for sanitary purposes is supplied from an on-site well.

Continuous drawdown on this well may impact available groundwater resources to the surrounding area.

This information will be used to understand and develop the environmental setting for the Environmental Assessment and to support staff development of the EA.

Response - The only water that flows through the fuel basin filter and chiller system is drawn from the basins. Water usage at GE-MO for 2002 is listed below:
basin additions averaged 236.0 gallons per day
2002 sanitary and other water uses averaged 191.4 gallons per day
2002 total water usage averaged 427.4 gallons per day

4-5 Provide annual flow data from the gauging station at the Dresden Lock and Dam for the previous 10 years. This gauging station is the closest station to the site on the Illinois River.

This information will be used to understand and develop the environmental setting for the Environmental Assessment and to support staff development of the EA.

Response - Attached is flow data for the Dresden Lock & Dam for the previous 10 years. GE-MO doesn't take water from, or discharge water to the river. The Midwest has experienced floods classified as 100-year floods. The flood affected the entire Mississippi River basin and all tributaries. The Illinois River experienced record flood levels also. However, during the 100 year flood, neither Dresden NPP, nor Morris Operation was ever in any flood related danger. (See 4-3)

4-6 Provide information on the dates which the spray irrigation system was in operation, the volumes of waste water discharged through the system, and the chemical and radiological analysis of waste water piped to the irrigation system. NUREG-O695 "Environmental Impact Appraisal Related to the Renewal of Materials License SNM1265 for the Receipt, Storage and Transfer of Spent Fuel" (Ref. 8), indicates that discharged waste water from the on-site holding ponds was piped to a spray field irrigation system on GE-owned land onsite.

This information will be used to understand and develop the environmental setting for the Environmental Assessment and to support staff development of the EA.

Response - The spray irrigation system was never operated. Operation of this system required an Illinois EPA permit and one was never issued.

4-7 Provide information on the groundwater flow velocity and flow direction in the vicinity of the GE-MO site. Provide any available information on groundwater flow velocity and flow direction under the GE-MO ISFSI.

This information is needed to determine any potential impacts from site operations and to support staff development of the EA.

Response - Ground water information is referenced in CSAR Appendix B, Dames & Moore reports from 1975, 1977, 1993 and 1994.

4-8 Provide all the data from groundwater monitoring program at the GE-MO ISFSI. Groundwater monitoring has been performed at the GE-MO site since 1993. Monitoring data provides information on contaminants present in the groundwater and their movement.

This information is needed to determine any potential impacts from site operations and to support staff development of the EA.

Response - Results of ground water monitoring since 1993 are attached.

4-9 Describe the impacts on the groundwater due to operations at the Dresden Nuclear Plant site and what implications the presence of tritium in the groundwater might have on the environmental monitoring program at the GE-MO ISFSI.

This information is needed to determine any potential impacts from site operations and to support staff development of the EA.

Response - There are no perceived impacts on GE-MO ground water by DNPP. As can be seen from the ground water monitoring, activity in the ground water is minimal. Tritium levels are very low (IEPA allows 20,000 ppm in Illinois River). On the infrequent times when tritium does appear, it is in the <2kppm range.

4-10 Provide information (dates, quantities, locations, material released) for all reportable spills, releases, accidental discharges to the environment since the previous Environmental Impact Appraisal.

This information is needed to determine any potential impacts from site operations and to support staff development of the EA.

Response - There has been no reportable level of spills or releases at GE-MO since the last environmental report.

4-11 Provide information on the construction specifications (size, liner thickness, liner materials) for the sanitary waste and other holding basins.

This information is needed to determine if there are any potential environmental impacts from past or continued operations of these basins and to support staff development of the EA.

Response - The sanitary lagoon system is an Illinois EPA regulated and permitted activity. Copy of the current permit is attached. Construction specifications and as-built drawings are no longer available as they were not considered part of the licensing basis. The basins (primary and overflow) function as evaporation ponds resulting in zero release.

4-12 Provide the analytical data and results from the Holding Basins and Groundwater Supply Well sampling program.

This information is needed to determine any potential impacts from site operations and to support staff development of the EA."

Response - Results of holding basins and groundwater supply well sampling are attached.

4-13 Provide information on the potential man-induced events at nearby (5 mile radius) industrial facilities that have the potential to affect the safe and continued operation of the GE-MO ISFSI. Include supporting documentation for the statement in Section 3.3 of the CSAR *"Explosions or fires at 'nearby' industrial facilities would be too far away to have any influence on fuel storage."* Describe the steps taken by GE-MO to assure that plant workers would not be sickened or

disabled by smoke, vapor clouds, or aerosol releases from nearby facilities.

This information will be used to understand and develop the environmental setting for the EA, to determine any potential impacts from site operations, and to support staff development of the EA.

Response - The statement referenced in the question is misquoted. The statement in CSAR 3.3 reads "any influence on fuel *in* storage", not fuel storage as stated above. Table 3-3 of the CSAR lists industrial facilities near to GE-MO, none of these facilities are deemed to present a danger to the fuel stored as discussed in 3.3. If an emergency did occur that could affect personnel, such as a general emergency at DNPP, GE-MO would follow actions per the GE-MO Emergency Plan. Non-essential personnel would be evacuated and essential personnel could wear respiratory protection until the threat cleared. If an evacuation was ordered by the State, such as in the case of a general emergency at DNPP, GE-MO would follow actions per the GE-MO Emergency Plan, including establishing appropriate security measures with Sate or Federal authorities, and plans for reoccupation of the site as soon as permitted by State authorities.

Request for Additional Information for General Electric - Morris Operation License Renewal Application

SECTION 5 - GENERAL QUESTIONS

5-1 Provide an updated corporate organization. Chapter 9.0 "CONDUCT OF OPERATIONS" of the CSAR contains Figure 9-1, "GE Morris Operation relationship to the GE Corporate Offices." The relationship depicted in this figure is different from the reporting relationship described during the June 6, 2001 site visit by the NRC.

Title 10 CFR 72.70(a) states that each specific licensee for an ISFSI "... *shall update periodically... the final safety analysis report (FSAR) to assure that the information included in the report contains the latest information developed."*

Response - Figure 9-1, as stated in 9.2 is a depiction of the principal organization levels of General Electric Company. It is not intended to show every level of GE Management between the Manager, MO and the Corporate CEO.

5-2 Justify the calculated direct radiation dose (2.9x1 0-6 mrem) to the public from GE-MO's reported stack discharge of 3.18 I-ICi of Beta (13) emitting nuclides as stated in 7.3.3 of the Consolidated Safety Analysis Report.

Title 10 CFR 72.1 04(a) requires *"During normal operations and anticipated occurrences, the annual dose equivalent to any real individual who is located beyond the controlled area must not exceed 0.25 mSv (25 mRem) ..."*

Response - The 2.9 x 10^{-6} has been corrected and 7.3.3 of Section 7 corrected to read 1.1 x 10^{-6} mRem as calculated using the COMPLY computer code.

5-3 Provide justification, or clarify the time estimate, of 54 days for the basin water level to evaporate to the top of the fuel rods if no make-up water is supplied.

Title 1 0 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with an adequate margin of safety.

Response - Attached is a copy of Basin Water Heat-up Rate Maximum Temperature and Time Required to Evaporate Down to Top of Fuel by J. D. Kesman, November 27, 2001

5-4 Explain why the general licensing conditions given as Section 1.2 of Appendix A of the GE-MO license are missing from Chapter 10 of the CSAR.

Title 10 CFR 72.11 requires *"Information provided to the Commission ... be complete and accurate in all material respects."*

Response - The general licensing conditions given in Section 1.2 of Appendix A of the GE-MO license have never been in Chapter 10 of NEDO-21326. QA Requirements (1.2.1) are in Section 11 and Fuel Transfer Canal Closure (1.2.2) has been in license SNM-2500 since it's origination with no reference in the CSAR.

5-5 Provide a reference or clarify the source for the equation used to estimate the gamma flux at the surface of the pool in Section 8.8.4.1 of the CSAR.

Title 10 CFR 72.24 requires the application contain sufficient technical information to support a finding that the ISFSI will satisfy the design basis with a margin of safety.

Response - CSAR Section 8.9 References -

5. Attenuation In Water of Radiation from Bulk Shielding Reactor: Measurements of the Gamma-Ray Dose Rate, Fast-Neutron Dose Rate and Thermal Neutron Flux, July 8, 1958 (ORNL-2518)

SECTION 6 - REVIEW OF PROPOSED AMENDMENTS 10 & 11

6-1 Provide justification for the relocation of specific surveillance requirements, limits, and frequencies from the TS to an in-house document titled "Morris Operations Compliance and Operability Tests." Section 4.0 of the approved TS contains surveillance requirements for the GE-MO ISFSI. Sections 4.1.1 through 4.10.1 identifies specific surveillance requirements, frequencies, and contamination limits for effluent air, waste water basins, sealed sources, instruments, coolers, process steam, cask coolant, and spent fuel storage basin water. These requirements are summarized in Table 4-1. The proposed Amendment 10 revision moves most of these requirements to in-house procedures.

Title 10 CFR 72.44(c)(1) requires a licensee to incorporate *"Functional and operating limits and monitoring instruments and limiting control settings."* in the TS. This RAI is necessary to help the staff assess how GE-MO intends to maintain regulatory compliance during the license renewal period and support the development of the SER and EA.

Response - Surveillances and their regulatory requirements are still specified Section 4.0, Surveillance Requirements. The details of how these surveillances are performed and specific reportability limits have always been, and continue to be described in GE-MO specific compliance and operability tests defined in Standard Operating Procedures. Table 4-1 was only a summary of the surveillances. SOPs require review and approval of the Safety Committee.

6-2 Provide additional justification for replacing basin water pH measurements with conductivity. Section 4.8 of the approved TS specifies the basin water shall be maintained as follows: pH = 4.5 to 9.0; $NaNO_3$ less than 200 ppm; and Cl- less than 10 ppm.

The proposed revision in Section 4.8 of Amendment 10 revised pH limit to read *"pH = 4.5 to 9.0 or equivalent conductivity measurement less than 2.5 μMho/cm."* Limits for $NaNO_3$ and Cl- remain unchanged.

The proposed revision in Section 4.5.1 of Amendment 11 eliminates the pH requirement for water chemistry and replaces it with a conductivity measurement of less than 2.5 μMho/cm. Limits for $NaNO_3$ and Cl- remain unchanged.

The NRC staff has reviewed the report by L. L. Denio and does not agree with its conclusions. In brief, the L. L. Denio report makes the assumption that the concentration of Cl- and H+ ions in the basin are equal and are the only electrolytes impacting the basin conductivity. This assumption cannot be conclusively demonstrated and the calculations based on this assumption are potentially erroneous.

Conductivity in any solution is the product of the sums of the individual conductivity of each electrolyte. The GE-MO calculation used to correlate pH and conductivity makes the assumption that the only electrolytes in solution are the Cl- and H+ ions, yet the discussion refers to the presence of dissolved CO_2 in the basin water and the current license allows up to 200 ppm $NaNO_3$ and a maximum of 10 ppm Cl-. Both the CO_2, in equilibrium with atmospheric pressure, and a concentration of 200 ppm $NaNO_3$ would provide a much larger concentration of electrolytes, and hence a larger conductivity, than the minimal quantities (1 x1 0-5) of H+ and Cl- ions used to establish the conductivity limit of 2.5 μMho/cm. Therefore, the use of conductivity as a measure of pH cannot be relied upon given the presence of $NaNO_3$ and

equilibration of basin waters with CO_2 and other atmospheric gasses.

Response - The basin water at GE-MO is kept very pure and purity is maintained using an upper limit of 2.5 μmho/cm for conductivity If the 2.5 μmho/cm limit is exceeded, it would likely be because of a source of contaminants in the basin water. In this case, a broader range of tests and evaluations would be performed to determine the cause and type of contaminants. The limit on NaNO3 is of limited value since the conductivity specification would be exceeded well ahead of the NaNO3 specification.

1. **Letter from R. A. Morgan to GE-MO Safety Committee dated February 8, 1996**
2. **Fax from Tom Dawkins, Bekman Instruments describing how to measure pH in High Purity Water.**
3. **Culligan Bulletin File No. CI-9443, Dated December 21, 1994 on Deionized Wayer – Its Quality and pH.**
4. **Culligan Bulletin File No. CI-9506, Dated February 15, 1995 on Deionized Water – Its Quality & pH: Part II with Culligan supplied attachment describing pH measurement**
5. **Culligan Technical Applications Bulletin No. DI-111, dated 1/76 on High Quality Water – pH and Specific Resistance.**
6. **Ultrapure Water, the Definitive Journal of High Purity Water, Volume 6, Number 5, dated July/August 1989**
7. **Ultrapure Water, the Definitive Journal of High Purity Water, Back to Basics, Measuring pH in High-Purity Water, dated October 1994**

6-3 Justify the deletion of staff qualifications from the TS. Section 6.2.2. of the approved TS details the minimum qualifications (education, specialized knowledge, and years of experience) for members of the staff, including Manager - Morris Operations, Manager - Plant Operations and Maintenance, and Manager - Plant Services. The proposed revision in Amendment 10 states that these positions are described in specific GE and GE-MO corporate position descriptions.

Title 10 CFR 72.28(c) requires a description of the operating organization, delegations of responsibility and authority, and minimum skills and experience levels for various staff positions. Additionally, 10 CFR 72.190 requires operators and supervisory personnel be certified in the operation of the equipment. In light of these regulatory requirements, the staff needs additional information on how GE-MO qualifies its operators and supervisory personnel and how GE-MO intends to demonstrate regulatory compliance during the license renewal period.

Response - The staff qualifications that existed in Amendment 9 only described 3 positions at GE-MO. Having specific position titles/descriptions in the license requires a revision every time a position title changed. Amendment 10 references the staff organization chart and description of responsibilities contained in the CSAR, Section 9. Specific qualification requirements are detailed in individual GE-MO Human Resources position descriptions. In addition, personnel changes and qualifications are transmitted to NRC Region III for review.

Attached is GE-MO Morris Operating Instruction (MOI) 606, MO Operations Training Program, Revision 14, dated 04-09-01, describing the operator training program.

6-4 Justify deleting the position descriptions for members of the Plant Safety Committee from the TS. Section 6.4.1. of the current TS states that the Plant Safety Committee will consist of members from the following positions:

a. Manager - Morris Operation
b. Manager - Plant Operations and Maintenance c. Manager - Plant Services
d. Plant Operations Engineer
e. Maintenance Engineer
f. Safety and Security Engineer

The proposed revision in Amendment 10 allows the GE-MO Manager to name the committee members and moves the description of the committee members to the Safety Committee operating procedures.

The Safety Committee is responsible for safety evaluations and, as such, must be technically qualified to review issues brought before it. Identification of the members and qualifications of the Safety Committee helps assure the NRC that potential safety concerns are reviewed by knowledgeable individuals. The proposed revision to the TS does not identify any member of the Safety Committee or provide information as to the qualifications or knowledge base of the committee. The NRC staff needs additional information on the qualifications of the Safety Committee members and how GE-MO plans to maintain committee qualifications during the license renewal period.

Response - Virtually every member of the Management/Supervisory staff at GE-MO is on the Safety Committee resulting in a very stable membership. Personnel changes are described in 6-3 above. The Safety Committee members are depicted in the CSAR, Section 9.0, Figure 9-2, GE-MO Organization Chart. Reorganizations, should they occur, require a revision to the CSAR Section 9.0, with submittal and justification to NRC.

Attached is GE-MO MOI 904, Revision 12, dated 11-19-97, Safety Committee, describing the GE-MO safety committee responsibilities and members.

6-5 Provide additional justification for removing root-cause-of-failure identification and corrective action development from the TS. Section 6.5.2.d. of the TS requires the Plant Safety Committee to identify the cause and define actions to eliminate or reduce the frequency of noncompliance situations that occur more than once in 3-months or twice in 12-months. The proposed revision in Amendment 11 eliminates the requirement for root-cause evaluation and corrective actions. Title 10 CFR 72.172 states: *"In the case of a significant condition identified as adverse to quality, the measures must ensure that the cause of the condition is determined and corrective action is taken to preclude repetition."* This information will assist the staff with its evaluation of the aging management system for the license renewal period and development of the SER and EA.

Response - The specific SOPs (Compliance & Operability Tests) detail review and reporting requirements based on the specific test. A compliance test that does not pass, as required in 6.5 for each condition, requires specific notification to the Safety Committee. Each non-conforming compliance test result and its degree of impact is individually reviewed

The 10 CFR 72.172 reference to conditions adverse to quality is detailed in NEDE-31559, Morris Operation Quality Assurance Plan, Section 16.0, Corrective Actions, dated April 1998 and approved by NRC on August 8, 2000. This is where the requirement is most logically placed, not in license TS.

6-6 Justify the deletion of the requirement for NRC notification of surveillance requirement

violations. Section 6.5.3.c. of the TS states that notification of NRC Inspection and Enforcement Regional Office, Region III, shall be made at the time of the next inspection, advising them of events that resulted in a surveillance requirement being violated. The proposed modification in Amendment 11 has deleted this requirement.

Response - Specific notification time to NRC for noncompliances described in Section 6.5 are described in 6.5.1(c) and 6.5.2(c). The deleted requirement 6.5.3(c) is only an information type of notification for the NRC Region III inspector during the visit and doesn't fulfill any regulatory requirement.

6-7 Provide additional justification for deleting the environmental monitoring program specifics from the TS. Section 8.1 and Table 8-1 of the existing TS describe the environmental monitoring program and identify specific sample mediums, collection sites, types of analysis, and frequencies for monitoring the environment around the GE-MO ISFSI. The proposed modification in Amendment 10 has deleted this information and allows changes in the program based on historic experience.

Title 10 CFR 72.44(c) & (d)(2) requires each licensee to include a description of the environmental monitoring program in the TS to ensure compliance with the technical specifications for effluents. In addition, historical trend analysis allows the identification of changes in the environment caused by man-made or natural events not directly associated with operation of the ISFSI. Revising the environmental monitoring program on the basis of historical information may enhance the facility's performance monitoring but the program should be clearly identified in the TS to assist the staff with the development of the EA for the license renewal period.

Response - Off-site Dose Calculation Manual is included in Appendix B22 of the CSAR. This manual presents methods for calculating doses to members of the public from releases of radioactive material from GE-MO and is the justification for deleting the environmental monitoring program specifics from the TS. Included in Amendment 10 was also a copy of the Off-Site Dose Calculation Manual and a 72.48 Justification for Change to the MO Environmental Monitoring Program by L. L. Denio, dated August 31, 1994.

SECTION 7 - REVIEW OF GE MORRIS OPERATION DECOMMISSIONING COST ESTIMATE

7-1 Reconcile the total decommissioning cost estimate in the Decommissioning Plan submitted by GE Morris with the cost estimate submitted by General Electric Company in its Self-Guarantee of Financial Assurance for Decommissioning.

GE Morris submitted a decommissioning cost estimate of $22,265,000 in its Decommissioning Plan, dated May 5,2000. However, GE Nuclear Energy submitted a decommissioning cost estimate of $31,314,000 for the GE Morris facility in a SelfGuarantee of Financial Assurance for Decommissioning dated March 16, 2000. In addition, by letter dated March 20, 2003, the Corporate Environmental Programs division of General Electric submitted a revised Self-Guarantee, which included a cost estimate of $37,900,000 for the GE Morris facility.

The dates of the cost estimates submitted with the Self-Guarantees of financial assurance bracket the date of the GE Morris estimate, but each of the Self-Guarantees estimate a higher cost than GE Morris.

Therefore, the licensee must reconcile the differences between the cost estimates submitted for the GE Morris Operation to demonstrate compliance with 10 CFR 72.30.

Response - The decommissioning estimate submitted in Section A.7 of NEDO-21326D9 (CSAR) is essentially a re-submittal of the estimate submitted as part of the previous license renewal. This estimate was not adjusted for inflation or other factors. As GE meets the requirements of 10CFR30 Appendix C "Criteria Pertaining to Use of Financial Tests and Self Guarantees for Providing Reasonable Assurance of Decommissioning", personnel preparing the license renewal application considered the use of the previous estimate acceptable.

GE separately updated its Self-Guarantee of Financial Assurance for Decommissioning (dated March 16, 2000) as part of the annual submittal for decommissioning assurance. This update adjusted the overall cost estimate based on inflation.

Due to the implementation of Statement of Financial Accounting Standards No. 143 (SFAS 143), which became effective January 1, 2003, GE modified its calculation of decommissioning obligations consistent with the new rule.

The new decommissioning estimate was developed following the guidelines of SFAS 143 and Statement of Financial Accounting Concept No. 7, *Using Cash Flow Information and Present Value in Accounting Measurements* ("CON 7").

Cost estimates for decommissioning each site are provided based upon a) inputs from third party contractors who undertake decommissioning, b) actual historical costs observed from internal efforts, and c) approved existing estimates.

Labor costs are based on estimates provided by third party contractors that have worked or bid on work at GENE locations.

Burial Costs are calculated based on prices quoted from existing operational burial sites.

Transportation costs are based on actual costs incurred by GENE, using third party contractors for the transportation of waste.

In accordance with SFAS 143 guidance, the current decommissioning estimates are adjusted by the expected inflation factor to determine what the decommissioning costs would be in the future at the time of decommissioning.

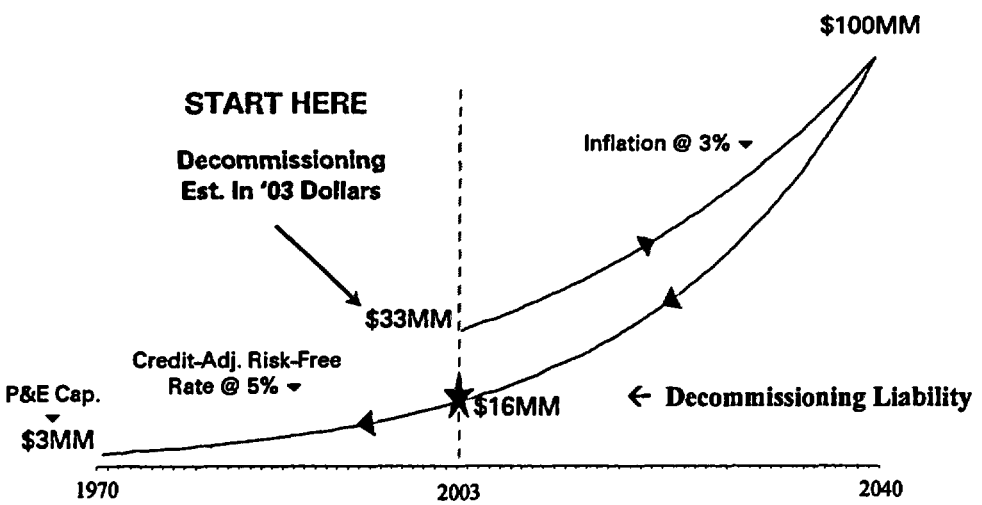
GE Models used inflation rates as published in a third party report on cost escalation and interest rates on the Department of Energy's ("DOE") Technical Studies & Reports website *[Civilian Radioactive Waste Management System, Management and Operating Contractor, Cost Escalation and Interest Rates, TDR-CRW-SE-000019 REV 00, October 2001, prepared for US Department of Energy, Office of Civilian Radioactive Waste Management.]*. The decommissioning estimate is based upon an assumed inflation rate, specific to nuclear cleanup cost, calculated based on the S&P's DRI-WEFA. According to the DRI-WEFA data, the long-term inflation rate is estimated to be 3.38%.

The decommissioning estimate used cost contingencies of 25% consistent with previous estimates. In addition, GE also obtained estimates regarding contingencies from a nuclear experienced third party contractor.

The liabilities of GENE are guaranteed by its parent company, GE. Therefore, the appropriated rate for discounting the future cost estimates to the present value at all GE sites, is the credit-adjusted risk-free rate of GE. As of the Valuation Date, GE was rated AAA by S&P, Fitch, and Moody's rating agencies. GENE used the yield on GE's unsecured debt issues that were publicly traded in the US market, as a proxy to estimate the credit-adjusted risk-free rate.

The date of decommissioning of the Morris facility depends upon the completion and operation of the Yucca Mountain facility or an alternate developed by the U.S. Government. For the purposes of the decommissioning estimate, a date of 2025 was used.

An example of the model used is provided below. This is representative of the model only and does not incorporate Morris-specific assumptions.



7-2 Identify radiological criteria for license termination used as the basis for the decommissioning cost estimate.

Section A.7.2.2, Performance Objectives, states that the objective of the licensee's Decommissioning Plan is to reduce residual contamination on exposed surfaces of site structures and components to permit unrestricted use, or to *"entomb on-site if such action is ... accepted by regulatory authority."*

Rules for radiological criteria for license termination were issued on July 21, 1997. Under those provisions, a licensee must meet radiological criteria defined as unrestricted use, restricted conditions, or alternative criteria (10 CFR 20 Sections 20.1402,20.1403, and 20.1404). There is no provision to *"entomb on-site'.*

Consequently, the licensee's Performance Objective must be revised to correspond to the regulatory criteria of Subpart E of 10 CFR Part 20.

In addition, the cost of decommissioning can be significantly affected by the license termination criteria selected by the licensee.

Therefore, the licensee must identify the radiological criteria for license termination, consistent with Subpart E of 10 CFR Part 20, that were used as the basis of its cost estimate, and, if necessary, revise the cost estimate to reflect the costs of meeting the criteria used as the basis.

Response - Section A.7.2.2 states the primary objective is to decontaminate the site to a point where continued USNRC licensing is no longer required. The discussion includes the potential that some residual radioactivity may be left behind assuming such as decision is determined to be protective of the public's health and safety and is approved by appropriate regulatory authority. The basis for the decommissioning estimate assumes unrestricted release, however, it is appropriate to acknowledge other options that may be considered.

7-3 Update the cost estimate to reflect 2003 costs.

The Decommissioning Plan states that the cost estimate is based on:

i) General Electric 1992 manpower rates for onsite work, and
ii) 1996 costs of shipping containers, transportation fees, and burial charges for disposal of low-level waste.

The costs submitted by the licensee are six to ten years old. However, NRC guidance (NUREG-1727, Appendix F, page F27) recommends that costs be updated at least every five years. Adjustments should be made to account for inflation, other changes in the price of goods and services, changes in facility conditions or operations, and changes in expected decommissioning procedures. The cost estimate, as submitted, does not appear to have updated the costs from the dates identified in the Decommissioning Plan.

The Decommissioning Plan states that low level waste will be disposed in the Midwest Compact Commission disposal site. However, that disposal site has not opened, and no date can be predicted when such a disposal site will be available. The licensee must revise its waste

disposal costs to include the cost of packaging, transport to, and disposal in an existing waste disposal site.

Therefore, the licensee must update its decommissioning cost estimate to include current prices for labor, goods, and services used for decommissioning to demonstrate compliance with 10 CFR 72.30.

Response - See response to 7-1 above.

7-4 Include an additional amount in the cost estimate to provide for an independent third party to assume responsibility for decommissioning the facility.

The Decommissioning Plan states that decommissioning tasks will be carried out by GE personnel, contractor personnel, or a combination of both. The Decommissioning Plan states further that General Electric 1992 manpower rates were used to calculate the costs for onsite work.

However, NRC regulatory guidance states that the cost estimate should be based on costs sufficient to allow an independent third party to assume responsibility for decommissioning the facility (NUREG-1727, Section15.1). This will provide sufficient funding to permit completion of decommissioning if the licensee is unable to do so. To assure that the funds are sufficient, the cost estimate must include costs for overhead and contractor profit, not simply the direct labor cost. In contrast to NRC guidance, the licensee's cost estimate does not identify any provisions for overhead and contractor profit costs.

Therefore, the licensee must revise its cost estimate to include additional amounts to cover overhead costs and contractor profit to provide sufficient funds for an independent third party to assume responsibility for decommissioning the facility to demonstrate compliance with 10 CFR 72.30.

Response - See response to 7-1 above.

7-5 Include a description of the means used to adjust the cost estimate and associated funding levels over the life of the ISFSI.

Title 10 CFR 72.30(b) requires the licensee to include information regarding the means used to adjust the cost estimate and associated funding levels over the life of the ISFSI. However, the licensee's Decommissioning Plan does not contain such information.

Therefore, the license must include information regarding the means used to adjust the cost estimate and associated funding levels over the life of the ISFSI to demonstrate compliance with 10 CFR 72.30.

Response - See response to 7-1 above.

7-6 Include the cost of the final status survey in the estimate.

The cost estimate does not specify the cost of the final status survey for license termination. However, NUREG-1727 (Section 15.1.1) states that the cost of the final status survey is a major activity whose cost should be included in the estimate.

Therefore, the licensee must include the cost of the final status survey in the estimate to demonstrate compliance with 10 CFR 72.30.

Response - The estimate prepared in response to SFAS-143 includes both the labor necessary to perform the final status survey and the cost associated with sample analysis at an independent laboratory.

ATTACHMENT INDEX

Section 1 – Identification of SSCs Subject to Aging Management

Tab No.	Description
	No Attachments at This Time

Section 2 – Aging Effects for Identified SSCs

Tab No.	Description
2-5	Morris Fuel Recovery Center Fuel Storage Basin Liner Visual Examination Summary Report, dated September 1993 Morris Fuel Recovery Center Fuel Storage Basin Liner Metallurgical Evaluation, dated May 1994
2-11	MSDS for Lube-Lok 4396 by Morgan Advanced Ceramics, Everlube Products Division. This company purchased the company that made Electrofilm 4396, and it is now known as Lube-Lok 4396.

Section 3 – Monitoring and Maintenance Programs

Tab No.	Description
3-1	Copies of the GE-MO PM program; MOI-401, Preventative Maintenance System, PM System data base, specific examples of PM instructions; and applicable Standard Operating Procedures. Specific items are discussed throughout this section.
3-8	Previous 12 months of demineralized water results.

Section 4 – Environmental Changes

Tab No.	Description
4-1	Report on Compliance with the Clean Air Act Limits for Radionuclide Emissions from the Comply Code, Version 1.5d
4-5	Flow data for the Dresden Lock & Dam for the previous 10 years.
4-8	Results of ground water monitoring since 1993.
4-11	Illinois EPA permit for sanitary lagoons
4-12	Holding Basins and Groundwater Supply Well sampling information.

Section 5 – General Questions

Tab No.	Description
5-3	Basin Water Heat-up Rate Maximum Temperature and Time Required to Evaporate Down to Top of Fuel by J. D. Kesman, November 27, 2001

Section 6 – Review of Proposed Amendments 10 & 11

Tab No.	Description
6-2	Reference information to justify replacing pH with conductivity in ultrapure water:
1.	Letter from R. A. Morgan to GE-MO Safety Committee dated February 8, 1996
2.	Fax from Tom Dawkins, Bekman Instruments describing how to measure pH in High Purity Water.
3.	Culligan Bulletin File No. CI-9443, Dated December 21, 1994 on Deionized Wayer – Its Quality and pH.
4.	Culligan Bulletin File No. CI-9506, Dated February 15, 1995 on Deionized Water – Its Quality & pH: Part II with Culligan supplied attachment describing pH measurement
5.	Culligan Technical Applications Bulletin No. DI-111, dated 1/76 on High Quality Water – pH and Specific Resistance.
6.	Ultrapure Water, the Definitive Journal of High Purity Water, Volume 6, Number 5, dated July/August 1989
7.	Ultrapure Water, the Definitive Journal of High Purity Water, Back to Basics, Measuring pH in High-Purity Water, dated October 1994
6-3	GE-MO Morris Operating Instruction (MOI) 606, MO Operations Training Program, Revision 14, dated 04-09-01, describing the operator training program.
6-4	GE-MO MOI 904, Revision 12, dated 11-19-97, Safety Committee, describing the GE-MO safety committee responsibilities and members.

Section 7 – Review of GE Morris Operation Decommissioning Cost Estimate

Tab No.	Description
	No Attachments at This Time