Enclosure 1 to
NRC-96-0013

FERMI 2

SELF-ASSESSMENT PLAN

SERVICE WATER SYSTEM OPERATIONAL PERFORMANCE INSPECTION (SWSOPI)

Numerous problems identified at various operating plants have called into question service water systems' (SWS) ability to perform their design function. These problems have included: inadequate heat removal capability, biofouling, silting, single failure concerns, erosion, corrosion, insufficient original design margin, lapses in configuration control or improper 10CFR50.59 safety evaluations, and inadequate testing.

As a result of concern over this historical lack of attention to the design, operation, and maintenance of the SWS, the NRC has developed a program to conduct inspections of these systems. These inspections are called Service Water System Operational Performance Inspections (SWSOPI) and are a total in-depth inspection of all aspects of the safety related SWS, and can extend into the various support systems. Inspections and/or self-assessments conducted under the auspices of a SWSOPI should address mechanical design, operational control, maintenance, and surveillance of the SWS, as well as quality assurance and corrective action programs related to the SWS.

Detroit Edison will conduct a self-assessment of the SWS, or a self-SWSOPI, in accordance with NRC Inspection Manual, Temporary Instruction 2515/118, Rev. 2 "Service Water System Operational Performance Inspection" and Inspection Procedure 40501 "Licensee Self-Assessments Related to Area-of-Emphasis Inspections". The emergency service water systems that will be included in the scope of the SWS Self-Assessment are the emergency equipment service water system (EESW), the emergency diesel generator service water system (EDGSW), the residual heat removal service water system (RHRSW), and the emergency equipment cooling water system (EECW).

The normal scope of a SWSOPI involves inspection of the safety-related SWS. The NRC is also concerned with the non-safety-related SWS that support safety-related functions at Fermi. The General Service Water (GSW) provides cooling to the Reactor Building Closed Cooling System (RBCCW) which in turn provides cooling to drywell and various safety-related components. The GSW system will be included from the lake through RBCCW and interface with safety-related equipment. In addition, isolation interfaces between the safety-related and nonsafety-related portions of the system will be included. Certain aspects of the GSW, such as single failure, seismic, etc., will not be applicable to the GSW portion of the self-assessment.

This assessment will include the following primary elements:

- assess SWS performance through an in-depth review of mechanical systems functional design and thermal-hydraulic performance; operating, maintenance, and surveillance procedures and their implementation; and operator training on the SWS,
- verify that the SWS's functional designs and operational controls are capable of meeting the thermal and hydraulic performance requirements and that SWS components are operated in a manner consistent with their design bases,
- assess planned and completed actions in response to GL 89-13, and
- assess SWS unavailability resulting from planned maintenance, surveillance, and component failures.

The Fermi self-SWSOPI will focus mainly on mechanical design; however, operational control, maintenance, surveillance, quality assurance, and corrective action programs related to the service water systems will also be examined. This will include, but not be limited to, evaluation of program implementation assessments, technical audits, review of corrective action program, and review of the SWS operational history to assess root cause determinations.

Prepared by: _____
R. J. Slottke
SWSOPI Team Leader

Approved by: W. J. O'Connor
W. T. O Connor, Jr.
Nuclear Assessment Manager

1.0 SELF-SWSOPI INSPECTION REQUIREMENTS

1.1 Design Review

The design review will evaluate the technical adequacy of the systems concentrating on essential safety and operational requirements. The review will consider items such as design assumptions, potential transients, component classification and qualification, actual system/plant transients, single failure criteria, potential flooding, common mode failure, and a selection of other attributes that contribute to the effectiveness of the system.

The Team will concentrate on items such as:

Design Basis Documents

UFSAR

NRC SER's

Drawings/Configuration Management

Calculations

Plant Technical Specifications (including Bases)

Vendor Documentation

NRC Correspondence Commitments

1.1.1 Mechanical System Design Review

This portion of the assessment will evaluate the design of selected system components required to satisfy the operational and safety functions of the system described in the design and licensing basis. This evaluation will review design documents, safety evaluations, and modification packages. Discussions will be held with plant and engineering personnel in the mechanical discipline and with other team members and plant personnel. A walkdown of the SWS will also be conducted.

The evaluation will be conducted in the following phases:

1. Review the sections of the UFSAR and licensing commitments which provide the regulatory requirements for the system. This will establish a basis for familiarization with the system's safety and operational requirements.

2. Review the SWS engineering calculations associated with the systems to determine if the system design bases are supported by calculations or other suitable documentation. Design margin assumptions will also be evaluated.

3. Review SWS plant modifications and select at least three significant ones for a detailed review. This review will verify consistency with the specific design conditions and adequacy of 10CFR50.59 evaluations

4. Review flow diagrams and piping drawings for consistency with design documents and licensing commitments.

5. Review the SWS operation as compared to the design documents. Incorporation of 10CRF50.59 evaluation results into appropriate procedures and calculations will also be evaluated.

6. Evaluate single active failure vulnerabilities of the system (Reference Action IV of GL 89-13).

7. Review the safety-related SWS for proper seismic qualification, and review non-safety related interfacing systems for effect on SWS operability.

8. Determine if flow balancing has been conducted for various system operating modes.

9. Review current design for potential impact on the original flooding analysis.

10. Review the effectiveness of any design features installed to minimize silting and biofouling of piping and components.

11. Review the program for monitoring system degradation.

The walkdowns of the SWS will evaluate attributes such as interconnection and interactions, erosion/corrosion susceptibility, as-built configuration, component layout, access for operations, inservice inspection, maintenance and physical separation of components.

1.1.2 I & C/Electrical Review

This area is being added in addition to those specified in TI 2515/118 due to the large number of systems being assessed and the importance of performing a thorough review in this area. Areas that will be addressed include reviews of the safety-related instrumentation loops for consistency with associated design basis documentation, review of instrumentation alarm and actuation setpoints to ensure they are consistent with design basis documents, review of the process of calibrating and testing SWS instruments (including acceptability of allowed tolerances), performing a detailed review of an I&C/Electrical related modification (if applicable), and review of Fermi's EDSFI issues for applicability to SWS.

1.2 Operations Review

The objective of the operations review is to verify that operators can perform the actions necessary to assure that the SWS fulfills its safety functions and that the SWS is operated within its design basis. This will be accomplished by assessing the adequacy of operating procedures and the availability of system status information such as instrumentation and alarms when operator action is required.

Evaluation of operating procedures will include a review of SWS system operating procedures, emergency operating procedures, abnormal operating procedures, and alarm response procedures. These procedures will be reviewed for adequacy (Reference GL 89-14, Action V), completeness, and consistency with SWS configuration. The review will also evaluate the impact of modifications on the operator's ability to perform required functions.

The operator training program, lesson plans, and course materials will be reviewed. The review will identify the level of detail the operators are provided in SWS design, safety function, and operational methods. It will also evaluate the timeliness and extent to which SWS modifications are included in the training program.

A review of the required operator actions for a loss of SWS suction head will also be assessed.

Lastly, the availability to the operator of essential system status information, as stated in plant procedures, will be assessed. This status information includes system flows, pressures, temperatures, alarms, etc., which are required for initiation of operator actions. This will be accomplished by reviewing design documents, interviewing Operations personnel, and in-depth system walkdown vs. design drawing check (Reference Action IV to GL 89-13). Particular attention will be paid to the availability of system status information when its safety function will be called upon. In addition, operations technical knowledge and involvement in operability assessments will be evaluated.

1.3 Maintenance Review

The objective of the maintenance review is to verify that maintenance of the SWS ensures that the SWS will perform its safety-related functions when called upon.

The review will focus on maintenance necessary to maintain the functional capability of the SWS. Maintenance records will be reviewed to determine if applicable safety-related components are included in the preventive maintenance program. Additionally, the maintenance evaluation will examine interfaces used to communicate and document maintenance activities. Examples of these interfaces are release of equipment for maintenance and evaluation of recurring problems.

The maintenance review will include an evaluation of SWS material condition, related physical characteristics observed during the system walkdown (Reference Appendix D of NRC TI 2515/118), and review of applicable documents and interviews of selected maintenance personnel.

1.3.1 Material condition will be evaluated via direct observation supported by review of documentation such as maintenance history records, station reports, and maintenance work requests. From this, the adequacy of system/equipment maintenance will be determined. These observations will include:

General Housekeeping/Leaks

Cleanliness/Labeling

Equipment environmental conditions

Erosion/Corrosion (Reference GL 89-13, Action III)

Silting/Biofouling (Reference GL 89-13, Action III)

1.3.2 Maintenance procedures, checklists, etc., which affect selected SWS components will be evaluated for adequacy (Reference 89-13, Action V), completeness, and consistency with vendor recommendations. The maintenance documents to be reviewed include those that address:

Preventive Maintenance

Corrective Maintenance

Repairs

Maintenance Work Orders

Maintenance Training

Maintenance History

Maintaining Equipment Qualification

Maintaining Plant Design Conditions

1.3.3 Maintenance training records will be reviewed to determine if maintenance personnel are being adequately trained in maintenance processes and procedures and appropriately assigned.

1.3.4 Maintenance evaluations will include any critical components and/or equipment or other components that have experienced high failure rates. The entire maintenance process beginning with the identification of a problem, or other condition, and ending with the close-out of the maintenance work order will be reviewed for selected maintenance activities.

1.4 Surveillance and Testing Review

The objective of the surveillance and testing review is to verify that surveillance and testing of the SWS demonstrates that the system will perform its safety functions when called upon during all operating conditions. The evaluation will focus on functional testing of the system and components within the system.

1.4.1 Testing and Surveillance evaluation will begin with the review of the design and testing baseline information for the SWS, including:

Initial Pre-operational Test Requirements, Criteria, and Results

Technical Specifications

UFSAR

Periodic and Surveillance Test Criteria/Procedures

Response to GL 89-13 Actions I & II

Plant Drawings

IST Program/Procedures

1.4.2 Selected samples of tests will be evaluated and compared to SWS functional requirements. These include:

Samples of modification package test documents to assure test requirements were appropriate for the scope and acceptance criteria was adequate to verify that modifications to SWS components were properly implemented.

Samples of completed maintenance work orders will be evaluated to determine if post-maintenance testing requirements were adequate to ensure that components/system have been returned to full operational status.

Implementation of effectiveness of Actions I & II in GL 89-13 will be evaluated.

1.4.3 The surveillance and testing reviews will include selected samples of the following components:

Pumps and Support Systems

MOVs, Check Valves, Relief Valves

Safety-Related Heat Exchangers

1.4.4 Interviews with selected operators, supervisors, maintenance, and engineering personnel will be conducted to complete the evaluation.

1.4.5 Other specific areas to be reviewed include: The effectiveness of testing to identify pipe thinning and flaws, and to verify total flow rates, the adequacy of current test methods to verify that intended results correctly reflect the acceptance criteria; verification that surveillance results accurately represent pipe and heat exchanger conditions; and any significant SWS component unavailability.

1.5 Quality Assurance, Corrective Actions, and Licensing Commitment Reviews

The objective of these evaluations is to verify implementation of the Quality Assurance program for activities such as: on-site and off-site review committees, corrective action, Technical Specification operability determinations, trending, and quality verification. The Corrective Action Program will be reviewed to determine why the plant quality verification activities did not uncover significant issues identified by the self-assessment team.

2.0 ASSESSMENT SCHEDULE

The following will be accomplished prior to start of field assessment:

Gather and assemble required documentation

Site access and radiation protection training of consultants requiring badging

Team orientation and Checklist completion

The onsite assessment is scheduled to begin on 2/26/96, with the assessment team exit meeting scheduled for 3/29/96. Following are the general activities planned.

WEEK ONE: Entrance meeting, documentation reviews, preliminary familiarization walkdown of SWS, personnel interview, initiate assessment activities, generate outstanding questions/concerns. Assemble documentation, review and complete or otherwise dispose of question/concern responses.

WEEK TWO: Continue assessment activities, review all information generated.

WEEK THREE: Week off-site for team members to review progress.

WEEK FOUR: Re-assemble team, review Fermi 2 responses, resolve any outstanding questions/concerns, and develop draft Finding and Observation reports.

WEEK FIVE: Issue draft Finding and Observation reports to responsible management, review and disposition any responses to draft Finding and Observation reports, commence drafting audit report, conduct exit meeting.

Final Report: Issued within 6 weeks after the exit.

3.0 INSPECTION TEAM RESPONSIBILITIES

3.1 Assessment Team Leader

The Assessment Team Leader is responsible for directing the course of the inspection and keeping the inspection focused on the relevant issues. The team leader will provide orientation and training to team members on the approach, methodology and overall expectations for the inspection. The Assessment Team Leader is responsible for reviewing and approving checklists, supplements, individual assessment plans and plant responses to all documented concerns. The Assessment Team Leader will consult as necessary with the Technical advisor when safety significant concerns arise. The Assessment Team Leader will promptly advise station management of potential safety/operability items and keep them informed if support for identified concerns is insufficient and/or untimely. The Assessment Team Leader is responsible for developing a summary report of assessment activities.

3.2 Assessment Technical Advisor

The Assessment Technical Advisor will be well versed in plant design basis, service water system and operability assessments. The Assessment Technical Advisor will act in an oversight capacity to the Team Members. The Assessment Technical Advisor will concentrate on the area of assessing safety significance of concerns identified by the Team Members. Additionally, the Assessment Technical Advisor will act as a facilitator between the Team and Senior Station Management to insure proper safety significance of any identified concerns is transmitted and that responses to concerns are timely and appropriate to the safety significance of the concern.

3.3 Team Member

Each Team Member will implement an inspection activity for their specific assigned area in accordance with the approved plan and checklist. The team members will review assigned areas of concentration and associated quality, corrective action and root cause issues within their area of concentration. Team Members should notify other appropriate Team Members and the Team Leader if a concern is discovered outside their assigned area of concentration.

4.0 SELF- SWSOPI TEAM MINIMUM QUALIFICATIONS:

4.1 Assessment Team Leader

An engineer, previously SRO certified, with at least 13 years nuclear experience including SWS system general knowledge, with a working knowledge of safety analyses, modification, design and operability assessments. This team member must have demonstrated a questioning attitude and possess the capability to direct the teams focus toward significant issues.

4.2 Assessment Technical Advisor

A Consultant with at least 15 years relevant experience, including nuclear plant design, and previous SWSOPI or SWS SSFI experience.

4.3 Mechanical Design Reviewer

An engineer with at least 15 years nuclear experience. The mechanical design reviewer must have a working knowledge of the design basis of a SWS. Additionally, he should have an understanding of the licensing basis of SWS, experience in modification preparation, 10CFR50.59 preparation, thermal/hydraulic design analysis and flooding analysis.

4.4 Operations Reviewer

A technical expert with at least 10 years nuclear experience and a current (or previous) SRO License. Must have a working knowledge of EOP/AOPs and control room operations. Experience in evaluating training program effectiveness and determining operator knowledge levels is desirable.

4.5 Maintenance Reviewer

An engineer with at least 10 years of nuclear experience, including root cause analysis and maintenance procedures. The maintenance reviewer should be familiar with vendor information programs, maintenance training programs, and post maintenance testing.

4.6 Surveillance/Testing Reviewer

An engineer with at least 10 years nuclear experience including design review and technical auditing, service water flow and thermal calculations, related surveillance test results including ASME Section XI component testing, and heat exchanger performance testing.

4.7 Quality Assurance/Root Cause Analysis Reviewer

An engineer or equivalent with at least 10 years nuclear experience, including system design basis knowledge, root cause analysis experience, and a QA/QC background. A background in licensing would be desirable.

4.8 I & C/Electrical Reviewer

An engineer or equivalent with at least 10 years nuclear experience, including a working knowledge of instrumentation and control loop functions.

5.0 REQUEST FOR INFORMATION/CONCERN PROCESSING AND RESOLUTION

During the assessment, questions or potential concerns shall be documented on an appropriate form and presented to the appropriate Station personnel for response. The time allowed for receiving the response will be determined by the Assessment Team Leader, and shall be commensurate with the significance of the concern and assessment schedule. The Assessment Team Leader will review, as necessary, concerns with the Technical Advisor to assess their impact on the system's safety function. Conditions and concerns that are potentially safety-significant will be promptly brought to plant management's attention using the Fermi 2 corrective action program. Responses will be reviewed for adequacy by the originator of the question/concern, the Assessment Team Leader and when applicable, the Technical Advisor. Where appropriate, the response should address the type of corrective action taken and/or proposed. Where responses do not resolve potential concerns, discussion with responsible personnel will continue until resolution is achieved. The Assessment Team Leader has access to all levels of management, but if a concern cannot be resolved prior to the assessment exit meeting, it will be identified and tracked as an item requiring a response, and dispositioned via Fermi 2 corrective action program, which is administered by the Safety Engineering department. All questions/concerns and documented findings, observations and responses will be kept as records of the assessment.

6.0 SELF-ASSESSMENT REPORT

A report will be issued which summarizes all of the areas reviewed, results of the review, and conclusions and recommendations.

7.0 FOLLOW-UP VERIFICATION

The team leader will work closely with Safety Engineering to follow-up responses to assessment findings and completion of corrective actions. Any overdue corrective actions will be promptly reported to management. The objective of this phase is to assure timely and effective resolution of significant issues.

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.1.a.1	Design Review & Configuration Control	Review design-basis documents, calculations, and analyses for the SWS, determine functional requirements and active components during accident and normal conditions. GSW system sizing and interfaces shall be part of this review.		
	3.0.1.a.2	Design Review & Configuration Control	Determine if system design is in accordance with facility licensing basis and commitments, and regulatory requirements.		
	3.0.1.a.3	Design Review & Configuration Control	Determine if system meets thermal and hydraulic performance requirements. Consider assumptions and recommendations from Sargent and Lundy report on GSW/RBCCW/DW Cooling for final adequacy determination.		
	3.0.1.a.4	Design Review & Configuration Control	Determine if design output documents are consistent with design basis, engineering analyses, and vendor recommendations.		
	3.0.1.b	Design Review & Configuration Control	Review SWS configuration drawings for consistency with design assumptions and component classifications and qualifications.		
	3.0.1.c	Design Review & Configuration Control	Review SWS operation as compared to design documents.		
	3.0.1.d.1	Design Review & Configuration Control	Evaluate single active failure vulnerabilities.		GL 89-13, Item IV
	3.0.1.d.2	Design Review & Configuration Control	Evaluate effects of failures of interfacing systems.		
	3.0.1.d.3	Design Review & Configuration Control	Examine potential common mode failures from fouling of common intakes.		
	3.0.1.e.1	Design Review & Configuration Control	Review effectiveness of any design features to minimize silting and biofouling.		
	3.0.1.e.2	Design Review & Configuration Control	Verify features provided for timely detection of flow degradation.		
	3.0.1.e.3	Design Review & Configuration Control	Verify flow balancing conducted during various system operating modes.		
	3.0.1.e.4	Design Review & Configuration Control	Verify runout conditions not present with minimum pumps running and worst case alignment of non-safety loads.		
	3.0.1.e.5	Design Review & Configuration Control	Evaluate minimum and maximum limits for valve positions and ensure proper controls.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.1.e.6	Design Review & Configuration Control	Verify flow balance is consistent with design assumptions.		
	3.0.1.f	Design Review & Configuration Control	Check design features to mitigate effects of flooding caused by SWS leaks.		(NUREG 1275 Vol 3 Section 3.3)
	3.0.1.g	Design Review & Configuration Control	Review safety-related portion of SWS for seismic qualification and verify non-safety portions can be isolated.		
	3.0.1.h	Design Review & Configuration Control	Review SWS modifications and select three modification packages for a detailed review of maintaining design basis (50.59 evaluation), revised maintenance requirements, operating procedures, training, and testing. (GSW system will be considered.)		
	3.0.1.i	Design Review & Configuration Control	Evaluate Fermi 2's assessment to Action IV of GL 89-13.		GL 89-13, Item IV
	3.0.1.j	Design Review & Configuration Control	Review program for monitoring system degradation.		
	3.0.1.k	Design Review & Configuration Control	Review setpoints for alarms and actuations, ensure consistent with the design basis and assumptions. Also refer to I&C/Electrical checklist item ICE.4.		
	3.0.1.1.1	Design Review & Configuration Control	Vulnerability from External Events. Check design features to mitigate effects of flooding caused by events outside the SWS.		
	3.0.1.1.2	Design Review & Configuration Control	Verify internal flooding analysis addresses potential flood hazards.		
	3.0.1.1.3	Design Review & Configuration Control	Verify external flooding analysis caused by natural events addresses potential flood hazards.		
	DRCC.1	Design Review & Configuration Control	Perform SWS walkdown. The walkdowns will evaluate attributes such as system interactions, erosion/corrosion susceptibility, as-built configuration, access to components, and physical separation.		
	3.0.2.a	Operations	Perform in-depth system walkdown, review configuration for consistency with design drawings. GSW will be part of walkdown.		GL 89-13, Item IV
	3.0.2.b.1	Operations	Review SWS procedures to assure the SWS is operated within the design envelope. Similar review will be performed for GSW.		GL 89-13, Item V

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.2.b.2	Operations	Review implementation of operating and alarm response procedures, and abnormal and emergency operating procedures.		GL 89-13, Item V
	3.0.2.b.3	Operations	Assess adequacy of flow instrumentation relied upon during accident conditions.		
	3.0.2.b.4	Operations	Review operating logs to determine adequacy of temperature and flow monitoring.		
	3.0.2.c.1	Operations	Review operator training for SWS and GSW, including incorporation of SWS modifications.		GL 89-13, Item V
	3.0.2.c.2	Operations	Review technical completeness and accuracy of the training manual and lesson plans.		
	3.0.2.c.3	Operations	Ensure lesson plans reflect system modifications and that operators have been trained on them.		
	3.0.2.d.1	Operations	Review implementation of procedures for verifying periodic and post-maintenance alignments of valves, especially those that isolate flow to safety-related components.		
	3.0.2.d.2	Operations	Verify required accident condition flow is not degraded during normal system operation valve alignments.		
	3.0.2.d.3	Operations	Review method used to verify proper SWS throttle valve position.		
	3.0.2.d.4	Operations	Review control of SWS heat exchanger flow variations due to changing climate. Similar review will be performed for GSW.		
	3.0.2.e.1	Operations	Walk through system operating procedures and P&IDs with engineering and operations staff.		GL 89-13, Item V
	3.0.2.e.2	Operations	Verify procedures can be performed and that components and equipment are accessible.		
	3.0.2.e.3	Operations	Determine if special equipment required to perform procedures is available and in good condition.		
	3.0.2.e.4	Operations	Verify operators knowledge of equipment location and operation.		
	3.0.2.f	Operations	Interview operators to determine adequacy of technical knowledge of SWS, its role in accident mitigation, tech spec surveillance requirements, and determination of operability.		GL 89-13, Item V
	3.0.2.g.1	Operations	Review local operation of equipment.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.2.g.2	Operations	Determine if available indication is in accordance with applicable operating procedures and instructions.		
	3.0.2.g.3	Operations	Verify environmental conditions assumed under accident conditions are adequate for remote operation of equipment.		
	3.0.2.h	Operations	Assess operational controls for loss of SWS suction head. Similar review will be performed for GSW.		
	3.0.2.i	Operations	Assess operational controls for response to external events.		
	3.0.3.a	Maintenance	Conduct in-depth system walkdown to review as-configured system for material condition. (SWS and GSW)		GL 89-13, Item IV
	3.0.3.b.1	Maintenance	Witness maintenance performed on system. (SWS and GSW)		
	3.0.3.b.2	Maintenance	Review maintenance package preparation, release of equipment for maintenance, and observe quality control involvement.		
	3.0.3.c.1	Maintenance	Review maintenance procedures for technical adequacy, completeness, and consistency with vendor recommendations.		GL 89-13, Item V
	3.0.3.c.2	Maintenance	Determine if procedures are sufficient to perform task and provide for identification and evaluation of equipment deficiencies.		
	3.0.3.c.3	Maintenance	Compare procedures to vendor manuals.		
	3.0.3.c.4	Maintenance	Verify important vendor manuals are complete and up to date.		
	3.0.3.d	Maintenance	Review maintenance program for removal and repair of SWS piping and interface system components due to degradation.		GL 89-13, Item III
	3.0.3.e.1	Maintenance	Determine if SWS components are being adequately maintained to ensure their operability under all accident conditions (including preventive maintenance program).		
	3.0.3.e.2	Maintenance	Review information regarding unavailability due to planned maintenance as an indicator of maintenance adequacy.		
	3.0.3.f.1	Maintenance	Review maintenance history for select SWS components for the past two operating cycles. Similar review for GSW components.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.3.f.2	Maintenance	Check for recurring equipment problems and any trends.		
	3.0.3.f.3	Maintenance	Evaluate adequacy of the root cause analysis and corrective actions implemented in response to adverse trends.		
	3.0.3.f.4	Maintenance	Review several completed maintenance activities for technical adequacy, performance of appropriate post-maintenance testing and satisfactory demonstration of equipment operability.		
	3.0.3.g	Maintenance	Conduct interview with maintenance personnel to determine their technical knowledge of how components are maintained.		
	3.0.3.h	Maintenance	Determine if maintenance personnel receive adequate training pertaining to the SWS and if degree of training is consistent with technical content of procedures.		GL 89-13, Item V
	3.0.3.i	Maintenance	Review the periodic inspection program used to detect corrosion, erosion, protective coating failure, silting, and biofouling.		GL 89-13, Item III
	3.0.4.a.1	Surveillance and Testing	Review and evaluate technical adequacy and accuracy of TS surveillance procedures and IST procedures performed in past two operating cycles.		
	3.0.4.a.2	Surveillance and Testing	Ensure design assumptions on system performance are satisfactorily demonstrated by the test methodology.		
	3.0.4.b.1	Surveillance and Testing	Review SWS design and licensing basis. This will include response to GL 89-13, Items I and II.		
	3.0.4.b.2	Surveillance and Testing	Verify test acceptance criteria are consistent with design basis to ensure testing adequately demonstrates the SWS will operate as designed.		
	3.0.4.b.3	Surveillance and Testing	Review indicators of SWS system performance to identify if testing inadequacies exist or if testing frequency is appropriate.		
	3.0.4.b.4	Surveillance and Testing	Determine if surveillance test procedures comprehensively address required SWS responses.		
	3.0.4.c.1	Surveillance and Testing	Review results from preoperational testing, determine whether SWS capabilities and limitations were appropriately demonstrated. Similar review for GSW.		
	3.0.4.c.2	Surveillance and Testing	Determine whether appropriate controls were established to avoid unacceptable system or component operating regimes.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.4.d	Surveillance and Testing	Evaluate the support systems and plant modifications selected for review to ensure surveillance and testing has been properly performed.		
	3.0.4.e.1	Surveillance and Testing	Review the IST records for pumps and valves in the SWS.		
	3.0.4.e.2	Surveillance and Testing	Review technical adequacy of procedures, trending of test results and recurrent failures.		
	3.0.4.e.3	Surveillance and Testing	Review IST program for completeness. This will include evaluation of the effectiveness of testing to identify pipe thinning and flaws, and verification of total flow rates.		
	3.0.4.f.1	Surveillance and Testing	Review methods for calibration and testing SWS instruments, valve testing, and how/where temporary test equipment is used to verify compliance with TS operability requirements.		
	3.0.4.f.2	Surveillance and Testing	Verify tolerance used for instrument accuracy is acceptable.		
	3.0.4.g	Surveillance and Testing	Witness post-maintenance, surveillance, and inservice tests performed on the SWS. Conduct interviews with selected personnel as appropriate.		
	3.0.4.h	Surveillance and Testing	Review procedures for periodic testing of safety-related heat exchanger heat transfer capability and trending of results.		GL 89-13, Item II
	3.0.4.i.1	Surveillance and Testing	Ascertain the system train, pumps, or significant component unavailability during power and shutdown conditions for two previous operating cycles.		
	3.0.4.i.2	Surveillance and Testing	Compare actual unavailability data to that assumed by the PSA.		
	3.0.4.i.3	Surveillance and Testing	Assess the degree to which accurate unavailability data has been input to the PSA.		
	3.0.4.j	Surveillance and Testing	Verify installed SWS components are tested to ensure the components will perform in accordance with their design bases.		GL 89-13, Item IV
	3.0.4.k.1	Surveillance and Testing	Review implementation of periodic inspection program to detect flow blockage from biofouling in other systems. SWS and GSW.		GL 89-13, Item I
	3.0.4.k.2	Surveillance and Testing	Include fire protection systems that use the same source of water as SWS.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	3.0.4.1.1	Surveillance and Testing	Review testing on one air-to-water heat exchanger served by the SWS to ensure proper heat transfer.		GL 89-13, Item II
	3.0.4.1.2	Surveillance and Testing	Examine the air side of the heat exchanger for fouling.		
	ST.1	Surveillance and Testing	Sample completed maintenance work orders to determine if post-maintenance testing requirements were adequate to ensure that components/system have been returned to full operational status.		
	3.0.5.a	Quality Assurance and Corrective Actions	Review meeting minutes of plant onsite safety review committee and offsite safety review committee for past six months for items pertaining to SWS. Similar review for GSW.		
	3.0.5.b.1	Quality Assurance and Corrective Actions	Review operational history of SWS including LERs, NPRDS, 50.72 reports, enforcement actions, DERs, TS operability determinations, work request, and adverse test results or recurrent test failures (trending).		
	3.0.5.b.2	Quality Assurance and Corrective Actions	Evaluate adequacy of root-cause evaluations and corrective actions.		
	3.0.5.c.1	Quality Assurance and Corrective Actions	Compare results of SWSOPI team's assessment of the SWS areas inspected with results of applicable quality verification activities in the same areas.		
	3.0.5.c.2	Quality Assurance and Corrective Actions	Determine why the quality verification activities did not uncover significant issues identified by the team.		
	3.0.5.d.1	Quality Assurance and Corrective Actions	Review timeliness and technical adequacy of resolution of findings from self-assessments.		
	3.0.5.d.2	Quality Assurance and Corrective Actions	Review open item tracking system items pertaining to SWS for adequate tracking and closure of identified deficiencies.		
	3.0.5.e	Quality Assurance and Corrective Actions	Evaluate interface between engineering and technical support (E&TS), maintenance, and plant operations regarding corrective actions to resolve operational problems.		
	ICE.1	I&C/Electrical	Review safety related instrumentation loops for consistency with associated design bases documentation.		
	ICE.2	I&C/Electrical	Review all modifications associated with SWS and select at least one for a detailed review. This review should include 50.59 evaluations and should ensure that the changes have not compromised the system design bases and have included document revisions.		

FERMI 2 SWSOPI

FUNCTIONAL AREA ASSESSMENT CHECKLIST

DUE DATE (STATUS)	TI2515	RESPONSIBILITY	DESCRIPTION	NOTES	REFERENCES
	ICE.3	I&C/Electrical	Review issues related to Fermi's EDSFI for applicability to SWS.		
	ICE.4	I&C/Electrical	Review setpoints for alarms and actuations, ensure consistent with the design basis and assumptions.		
	ICE.5	I&C/Electrical	Assess adequacy (calibration and testing) of flow instrumentation relied upon during accident conditions.		

Prepared by: _____
R. J. Slottke
SWSOPI Team Leader

Approved by: W. T. O'Connor
W. T. O'Connor, Jr.
Nuclear Assessment Manager