In Service Testing Owners' Group

POSITION PAPER

Title: Position on IST Component Preconditioning

Approval Date: 28 February 2011

Purpose:

This paper is prepared in response to numerous inspection findings and questions from industry personnel regarding the issue of preconditioning. In recent years there have been many regulatory findings concerning preconditioning, with much diversity in opinion as to what constitutes "acceptable" and "unacceptable" preconditioning. The purpose of this paper is to document a consensus standard among industry IST owners regarding preconditioning of components subject to IST.

Background:

Differences of opinions regarding preconditioning exist throughout the nuclear industry. The differences in opinions were very obvious during ASME Code Committee attempts to define and use terminology such as "*preconditioning*" and "*as-found condition/testing*". Actions to produce related Code changes were tabled due to failure to obtain consensus. This ISTOG Technical Position is intended to establish a guideline to be used by IST program owners whereby preconditioning activities are recognized in advance and managed accordingly to ensure the integrity of Code required testing is preserved.

A primary goal of the IST Program is to monitor components for degradation so that timely action can be taken to correct deficiencies that may develop which could prevent the components from performing their safety function(s). IST Program test activities are intended to identify problems by collecting relevant data on a periodic basis, evaluating the component's performance based on these test results, and trending performance over time. Ideally, IST tests are conducted in such a manner that a component's ability to perform is not altered by one or more preconditioning events (intentionally or unintentionally) which occur during a given time period before the test. In this way, the component's condition is somewhat "random" as it may be when called upon to perform its function.

Some level of preconditioning is unavoidable (e.g. a normally closed valve must first be opened before it can be timed closed.) Additionally, some level of random preconditioning is acceptable. IST data is not always so precise that it would be corrupted by an occasional, slightly biased datum due to preconditioning.

There may be justification for not performing as-found IST prior to maintenance, such as, those instances where maintenance would result in a significant improvement in component performance. Results of tests run prior to performance of such maintenance will no longer represent the operating characteristics of the repaired component, and pre-maintenance test data would be of limited value in predicting the future performance of the component. However, this position should only be taken if the components past test results indicate that the component is not vulnerable to fail prior to the performance of the work.

The practicality of performing an as-found test should be assessed by comparing the benefit and burden involved. Where the burden of performing the as-found test clearly outweighs the benefit that might be gained, an as-found test may be eliminated upon evaluation by the Owner. Benefits associated with as-found tests vary with vulnerability of the test to preconditioning activities, and the value of the test data in predicting future component performance.

Regulatory Guidance:

In addition to the Code requirements that govern IST, NUREG-1482 (Reference 3) provides numerous recommendations on IST. The referenced revision of this NUREG contains specific recommendations regarding preconditioning of pumps and valves. NRC Inspection Manual Part 9900 (Reference 2) also contains guidance for inspectors to identify situations of unacceptable preconditioning. The development of this position includes consideration of these NRC

recommendations.

Definitions:

Preconditioning - It is ISTOG's position that Preconditioning be defined as Acceptable or Unacceptable as follows:

- *Unacceptable Preconditioning* - Any activity performed prior to or during an inservice test which alters one or more of the measured parameters such that it results in acceptable test results This could include activities such as cycling, cleaning, lubricating, agitating, or other specific activities performed prior to or during an inservice test that could mask component degradation. The impact may depend on the design of the component. For example, stem lubrication has essentially no impact on an MOV; however, may influence the test result of an AOV.
- *Acceptable Preconditioning* - Any activity which has the potential to affect the ability to detect a degrading performance trend but for which factors are involved that would justify the preconditioning; or, an activity performed prior to IST that has no potential to mask component degradation. This could include activities such as cycling, cleaning, lubricating, agitating, or other specific activities performed prior to or during an inservice test that would not mask component degradation. A documented evaluation of the non-adverse impact upon the component's as-found condition is recommended. This evaluation should be performed in advance of the pre-conditioning activity.
- *As-found Testing* - Testing performed on components in their "as-found" state (e.g. the components have not undergone preconditioning of a nature deemed unacceptable).

Position:

Preconditioning of components is not specifically addressed by any currently issued edition or addenda of the ASME Code for Operation and Maintenance of Nuclear Power Plants, herein referred to as the Code. As-found testing (other than for pressure relief devices) is not a written requirement of the Code for pumps and valves. However, it is the position of the Inservice Testing Owners' Group (ISTOG) that Inservice Testing (IST) be performed in such a manner that the condition of a component when tested will be as-found, to the extent practical, and that only acceptable preconditioning be performed. In support of this, the following guidelines are provided.

<u>Quarterly (or more frequent) IST</u>

Care should be taken to ensure that procedures, surveillances, or tasks are not scheduled such that "unacceptable" preconditioning of a component prior to the IST occurs. Where unacceptable preconditioning would occur, the procedure/task should specify that an as-found test be performed. No as-found test is required prior to corrective maintenance for components which are tested quarterly as long as the test history trends indicate that the component is not vulnerable to fail prior to the performance of the work.

Infrequently Performed IST (cold shutdown or refueling frequency)

Due to the longer interval of Cold Shutdown and Refueling IST, to the extent practical, Cold Shutdown and Refueling IST should be performed prior to any event which may unacceptably precondition the component.

Timing of Maintenance and IST

In general, routine component maintenance activities are performed at longer intervals than IST. For example, a preventive maintenance (PM) actuator overhaul on an air-operated valve (AOV) may be scheduled every 8 years while the IST stroke time test is performed quarterly. That actuator overhaul could definitely affect the stroke time of the AOV and therefore it meets the definition of preconditioning. However, the IST stroke time is performed in true as found condition 31 times prior to the scheduling of that PM event. It would be acceptable preconditioning to perform the IST stroke timing **after** the PM event in this example.

As long as a routine maintenance activity is performed at an interval approximately four times longer* than the applicable IST exam the performance of that maintenance before the IST may be evaluated to determine that it is acceptable preconditioning. In order for it to be acceptable preconditioning, it should be determined that there has been no evidence of a degrading trend with potential for exceeding acceptance criteria prior to that maintenance activity. In that situation the IST should be performed immediately prior to the maintenance in order to verify test results were still within acceptable limits.

* - The basis for this guidance is the knowledge and experience of the authors and reviewers of this document. There is no specific technical basis and IST Program Managers may adopt different guidelines. The principle underlying this guidance is that multiple as-found tests between routine maintenance activities provide satisfactory opportunity to identify any degradation. It is extremely improbable that a component may have suffered rapid degradation immediately prior to the maintenance activity and that such routine maintenance restores the performance to normal.

Where it can be shown that an activity to be performed either has no affect on the testing results, or can detect component degradation better than the IST (e.g. certain preventative and corrective maintenance activities), or where the maintenance is so extensive that it will result in an essentially new component (i.e. one having new operating characteristics), then an evaluation may be made that the timing of the IST is inconsequential.

Reporting of Unacceptable Preconditioning

It is recognized that certain events (e.g. emergency shutdown, errors in initial test performance, discovery of required maintenance in a mode where the as-found test cannot be performed, etc.) may result in preconditioning prior to IST. This would not represent a violation of IST Technical Specification requirements since preconditioning is not an explicit Code requirement, however it may be considered a violation under

10CFR50 Appendix B.

When preconditioning questions or concerns arise, such events should be evaluated to determine if unacceptable preconditioning has occurred using the guidelines in this document, NUREG 1482, Rev. 1 (Reference 3), USNRC Information Notice, IN 97-16 guidance (Reference 4) and NRC Inspection Manual Part 9900 "Maintenance - Preconditioning of structures, systems and components before determining operability" (Reference 2). This guidance includes evaluating the following questions:

- *Does the practice performed ensure that the pump or valve will meet its testing acceptance criteria?*
- *Would the pump or valve have failed the test without the preconditioning?*
- *Does the practice bypass or mask the as-found condition of the pump or valve?*
- *Is preventive maintenance routinely performed on the pump or valve just before testing?*
- *Is preventive maintenance on the pump or valve performed only for scheduling convenience?*

NOTE: This position paper provides guidance which may be at odds with the last bullet in the above list. Where preventive maintenance (PM) is being performed at an interval much greater than the IST exam interval, it may be evaluated to be acceptable to perform the PM prior to the IST exam as was previously discussed. The intent of preventive maintenance is not to restore a component to an operable status and with multiple IST exams performed between the PM events any degradation will already have been identified and trended.

If unacceptable preconditioning has occurred and conditions no longer support conduct of an as-found test until the maintenance activity is completed, the event should be captured in the corrective action program to evaluate the impact and take any additional remedial actions that may be necessary; such as additional tests, results of the inspection, condition of replaced parts, etc..

Documenting Acceptable Preconditioning

Documenting acceptable precondition is not an explicit Code requirement; however, it is recommended that Owners document significant or borderline determinations that a potentially unacceptable preconditioning activity is indeed an acceptable preconditioning activity. Regulatory findings have established a strong precedent that plants should have written evaluations and/or technical positions documenting preconditioning scenarios. Establishing a plant specific technical position with a listing of examples of acceptable/unacceptable preconditioning, similar to this document, would be an adequate method to establish general guidelines. Other methods may include documentation in the work order, operator logs or in the test record. The intent is to ensure that the condition has been reviewed.

Examples of Acceptable Preconditioning

Note that some of the examples which follow may not describe scenarios involving Inservice Testing. These examples are included with the intent to help in understanding the concepts of acceptable and unacceptable preconditioning.

- The minimal manipulation of a system to allow for control or isolation of components for maintenance or situations such as:
  - Operating components for normal system operation or test configuration (for example, cold weather operations)
  - Cycling breakers to allow removal from service and restoration
  - Racking breakers in or out and installing on a test stand
  - Installing jumpers or hydraulic/pneumatic connections.
- Pressurizing/Depressurizing to setup for required tests and leak checking.
- Recovery activities to regain operable status for an SSC in an LCO.
- A preventive maintenance activity that instead of sending a component off-site for regular calibration, replaces it with one that has already been tested and calibrated.
- A surveillance test that follows preventive maintenance is acceptable preconditioning if the test is performed at least 4 times more frequently than the PM, e.g. a quarterly test that follows an annual PM.
- A surveillance test that follows corrective maintenance or preventative maintenance is acceptable preconditioning if the component's test results would indicate that it was not vulnerable to fail prior to the work.
- Venting a system prior to running the system for a pump performance test provided that the venting operation has proper controls. Venting does not enhance pump capacity but does prevent transients on the system. Abnormal gas quantity identified in such venting would need to be evaluated in the corrective action program and may have system operability impact.
- Lubricating AC MOV valve stems prior to stroke time testing has been evaluated to be insignificant with regard to detecting degradation. AC MOV motors draw more or less current as running loads change but motor rotational speed remains essentially constant and therefore stroke time is unaffected. Numerous plants have strong technical basis documents which support this conclusion.
- Wetting valve seat/disc prior to stroking to meet manufacturer's recommendations and to simulate accident conditions. (e.g. MSIVs tested with steam present)
- Manually cycling a new switch prior to installation to remove any possible "set" in the contacts or mechanism.

- Multiple components being affected by data collection on other instruments.
- A transmitter is removed from service, test equipment installed, and the transmitter and test equipment vented to remove air introduced during test equipment installation.
- Instrument & Control PM's that check instrument loop control, alarm, or indication functions downstream of an isolator, prior to upstream device calibration or tests.
- Performance of operational procedures which produce full or partial flow through check valves prior to leakrate testing per ISTC-3600. This is acceptable preconditioning if it is part of normal, established system operational procedures, lineups, etc.
- Stroking or stroke time testing of MOVs / AOVs prior to leakrate testing per ISTC-3600, as long as the final closure of the valve utilizes normal, remote actuation.
- Venting of permanent plant indicators prior to use for IST data recording is acceptable if such venting is per established procedural guidance and the intent of the venting is solely to ensure accurate indications. Note that the ASME Code actually *requires* that an indicator be vented if the presence of air may influence the indication.
- Operational procedures to flush systems at the start of refueling outages to reduce dose levels prior to inservice testing exams.
- Operational procedures that require periodic operation of components to ensure availability due to circumstances beyond the control of the facility; such as cold weather operations or hurricane preparations.
- For AC MOVs:
    - It is acceptable to stroke the valve as many times as necessary for operational reasons prior to performing a timed stroke for IST.
    - It is acceptable to perform a packing torque adjustment up to the controlled torque value prior to any IST exam.
    - It is acceptable to lubricate the stem prior to stroke timing.
- For power-operated valves with as found stroke times outside IST (acceptable range) limits but within the Limiting Value of Full Stroke Time (aka Owner Specified Limits), it is acceptable to immediately re-stroke and time the valve in accordance with the guidance in ASME OM Code Section ISTC-5115(b), 5123(b) or 5133(b). The purpose of the re-stroke is not to satisfy operability criteria and analysis of the as found stroke time measurement is required.

<u>Examples of Unacceptable Preconditioning</u>

- Scheduling the performance of consecutive tests if one test preconditions the other. Such tests should be scheduled as far apart as the intervals allow.
- The scheduling of maintenance work activities immediately prior to the performance

of Tech Spec surveillances with the intent of ensuring favorable test results (i.e. activities are known to influence test outcome).

- Removing electrical loads prior to breaker load surveillance testing.
- Lubrication of an Air Operated Valve (AOV) valve stem prior to inservice testing with the intent to improve test performance. Lubrication of such a valve during a longer interval preventive maintenance activity at some point between surveillance tests would not typically be considered unacceptable preconditioning.
- Adjustment of flow to the lowest possible value during inservice testing of a marginal pump in order to obtain acceptable DP measurement.
- Manually cycling a breaker prior to testing when it is known that cycling results in influencing test outcome.
- Exercising an AOV immediately prior to a surveillance test on the valve. For AOVs which stroke automatically as a result of system manipulations during the surveillance testing, the stroke time test should be performed during the first stroke of the valve. Normal system operations conducted during the periods between surveillance tests may cause such valves to cycle and this would not be considered unacceptable preconditioning.
- Performing multiple strokes of multiple valves operated from a single (ganged) switch to obtain individual stroke times when a means exists to obtain the stroke times simultaneously. In the absence of such means, measuring as found stroke times of different valves in a staggered manner to obtain true as found results as frequently as possible for each valve would be acceptable.
- Routine electrical grooming such as tightening connectors, burnishing contacts, etc, just before or during testing. (When done as a regularly schedule PM for the purpose of maintaining the system in its optimum condition and not performed before every test, then it would be acceptable.)
- Filling floor/equipment drain loop seals just prior to testing a ventilation systems capability to maintain pressure conditions in a given space.
- Procedures that contain instructions requiring inspection, cleaning, and lubrication of breakers before performing surveillance testing of the breaker functions.
- Procedures or work order task instructions that contain steps requiring component manipulation or unnecessary enhancement to the as found conditions before performing surveillance testing.

Operating Experience

Note that some of the OE examples which follow may not describe scenarios involving Inservice Testing. These examples are included with the intent to help in understanding the concepts of acceptable and unacceptable preconditioning.

Testing Methodology

June 2003, Quad Cities Nuclear Station - NRC inspectors observed a routine surveillance test of the Unit 2 emergency diesel generator. Following the test, the licensee initiated a Condition Report to address an adverse condition in that a start time response recorder was not started before starting the emergency diesel generator. The emergency diesel generator was stopped, the recorder properly initiated, the emergency diesel generator promptly restarted, and the testing documented as satisfactorily completed. The inspectors interviewed the involved operators who indicated that they had initially questioned whether the prompt restart unacceptably preconditioned the emergency diesel generator. NRC Analysis: Such a practice could prime fuel subsystem components and pre-lubricate or otherwise exercise air start or other subsystem components in a manner that might beneficially affect emergency diesel generator starting time response and thus mask an adverse condition. This event was considered unacceptable preconditioning and a violation of 10 CFR 50, Appendix B, and was treated as a Non-Cited Violation.

1995 D.C. Cook Plant - NRC IR 50-315/316-95010 identified that the licensee's policy was to use the air start system to turn over (roll) the emergency diesel generator (EDG) crankshafts with the cylinder petcocks open to purge (blow down) any accumulated water or oil before the surveillance test was performed. Since this activity was performed to prevent potential damage caused by hydro-locking during the surveillance test starts, the safety benefit of rolling the diesels outweighed the benefit of testing in the as-found condition (acceptable preconditioning). However, the staff was concerned that air start valves were used (unnecessarily) to roll the EDGs when this activity could have been performed manually by "barring over" the crankshaft. Barring over the crankshaft would have avoided the possibility of preconditioning the air start valves and would have ensured that they were being tested in an as-found condition. NRC IR 50-315/316-95013 identified the practice of using the air start system to roll the EDGs prior to surveillance testing as a failure to test safety-related equipment under suitably controlled conditions and in accordance with design and licensing bases. This failure was cited as a violation of 10 CFR Part 50, Appendix B, Criterion II, "Quality Assurance Program."

1995 D.C. Cook Plant - NRC IR 50-315/316-95013 identified the practice of operating the turbine-driven auxiliary feedwater pumps immediately before performing the surveillance tests and the practice of venting the residual heat removal pumps immediately before performing surveillances tests as examples of unacceptable preconditioning. The failure to test safety-related equipment under suitably controlled conditions and in accordance with design and licensing bases was cited as a violation of 10 CFR Part 50, Appendix B, Criterion II, Quality Assurance Program.

1995 Cooper Nuclear Station - NRC IR 50-298/95-04 identified that plant operators had

recognized that performing a series of different high-pressure coolant injection system and reactor core isolation cooling surveillance tests in sequence, without allowing sufficient time for the systems to cool down between tests, would constitute unacceptable preconditioning. However, the operators did not identify nor document the full extent of the preconditioning concerns, nor did they initiate appropriate corrective actions to ensure that preconditioning would not be repeated. The failure of the operators to fully recognize and initiate action to correct preconditioning concerns was cited as a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings."

June 2004 River Bend Station - During a review of "Division I Diesel Generator Operability Test," the inspectors identified three activities that were unacceptable preconditioning. The activities were: (1) running the DC fuel oil booster pump prior to starting the EDG; this practice was considered preconditioning because it pressurized the fuel line prior to starting the engine and there was no acceptance criteria to assure that the pressure in the fuel line had returned to its normal standby condition prior to starting the engine, (2) draining the rear air start distributor prior to starting the EDG; there was no threat of damaging the engine if this practice was discontinued and there are no acceptance criteria to establish how much oil may be drained without affecting operability and (3) air rolling the diesel engine (preconditioning of the air start solenoids) prior to starting the EDG; this issue has previously been raised by IN 97-16

Scheduling Activities

March 2003, Limerick Nuclear Station - NRC inspectors noted the order in which outage preventive maintenance and testing activities were performed. Limerick routinely changed out the Recirculation Pump Trip Breakers prior to response time testing required by Tech Specs. Limerick had not evaluated whether it was acceptable, from a preconditioning viewpoint, to perform the change-out prior to the required surveillance test. The inspectors identified that the preventive maintenance performed on these components prior to testing preconditioned them and, as a result, masked the as-found condition.

March 2003, Limerick Nuclear Station - For safety-related battery chargers, Exelon routinely performed preventive maintenance prior to the 24-month surveillance tests. The scope of the preventive maintenance procedure included adjustment or replacement of battery charger components that could affect the ability of the battery charger to meet Tech Spec requirements. For example, during the Unit 2 outage in March 2003, Exelon replaced the a battery charger current limit card during maintenance activities prior to the 24-month surveillance test, and as-found data for the current limit was not taken. Thus, Exelon could not demonstrate that the battery chargers would have supplied the 300 amp current required by Tech Specs for the preceding 24-month surveillance interval. Following discussions with the inspectors, Exelon concluded that their practices constituted unacceptable preconditioning.

January 2004 Davis Besse - The NRC identified a NCV of 10 CFR Part 50, Appendix B, Criterion XI. Specifically, the licensee failed to recognize that flushing the system and

blowing down the strainers upstream of the turbine driven pump bearing cooling water strainers prior to routine surveillances constituted preconditioning of the AFW system. The team determined that the flushing of the lines and blowing down of the strainers constituted preconditioning of the turbine driven AFW pumps because it masked any performance problems which could occur during an actual event.

Sept 1996 St. Lucie - NRC IR 50-335/96-11, 50-389/96-11 identified that the four containment spray flow control valves (two for each unit) were being unacceptably preconditioned prior to surveillance testing. Specifically, the valve stems were being lubricated prior to performing stroke time testing. The failure of the licensee's administrative procedures to ensure that these stroke time tests were performed under suitably controlled conditions was cited as a violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control."

April 2010 Monticello Plant - NRC Integrated Inspection Report 05000263/2010003, On April 26, 2010, during a review of scheduled surveillance tests for the work week, the inspectors identified that a WO for preventive maintenance (PM) activities for the Division II 250 Vdc battery charger D90 and ESP-ELE-0549-09, "D90 250 VDC Swing Charger Capacity Test," were scheduled for the same timeframe on April 27, 2010. Procedure ESP-ELE-0549-09 is performed every 24 months to satisfy TS surveillance requirement (SR) 3.8.4.2 to verify that the D90 battery charger can deliver the required current at the required minimum float voltage for greater than four hours. After identifying this scheduling issue, the inspectors promptly questioned the senior reactor operator (SRO) stationed at the work execution center (responsible, in part, with shift operations management, for releasing WOs and surveillance tests to the field for implementation) which activity was being performed first; the TS surveillance test (ESP-ELE-0549-09) or the PM activity. The inspectors also reviewed the work impact statement associated with the TS surveillance test procedure to determine whether any preconditioning concerns were identified. Because the work schedule was not specific and the impact statement for the surveillance test did not identify any preconditioning concerns, the SRO entered the issues into the corrective action program (CAP 01229358) and administratively restricted performance of the PM activity and surveillance test scheduled for the following day. The inspectors next questioned the electrical maintenance supervisor assigned to the PM activity and surveillance test. The supervisor intended on conducting the tasks in the same order as had been done in 2008: the PM activity before the surveillance test. Based on the inspector's questions and concerns, the licensee rearranged the D90 PM activities and surveillance test on the schedule to ensure that the equipment was tested in the as-found condition. The licensee also reviewed the work schedule for the remaining battery charger PM activities and surveillances scheduled during the following weeks to ensure that no preconditioning could occur. The licensee performed an evaluation of the 2008 conduct of PM activities and surveillance tests for the 250 Vdc battery chargers to determine whether preconditioning occurred; and if so, whether the preconditioning was acceptable or unacceptable. Because TS SR 3.8.4.2 was a new requirement of the Improved Technical Specifications that the licensee

had transitioned to in June 2006, the 2008 performance of the surveillances was the first time the tests were required to be performed. Therefore, the licensee determined that only the PM activities and surveillance testing in 2008 were applicable for an extent-of-condition review. The inspectors were presented with a white paper outlining the licensee's position that concluded that the 2008 PM activities were most likely conducted prior to surveillance testing and the scope and intrusiveness of the PM activities had reasonable potential to mask the as-found condition of the 250 Vdc battery chargers. Therefore, the licensee concluded that the conduct of the PM activities on the 250 Vdc battery chargers in 2008 had unacceptably preconditioned the TS equipment. The licensee generated an additional CAP (01235130) to document the conclusions of their review and to perform additional causal evaluation of the issues.

Test Procedures

March 2004, McGuire Nuclear Station (PIP M04-2788) - The McGuire procedure for performing Ice Condenser lower inlet door surveillances tests (PT/0/A/4200/032) included the lubrication/cleaning of seals and hinge bearing housings prior to testing. After review of this practice the NRC identified this as unacceptable preconditioning prior to a surveillance test and a violation of 10 CFR 50, Appendix B, and a Non-Cited Violation was given.

July 1994 Cooper Nuclear Station - NRC IR 50-298/94-16 identified that electrical loads were removed from a number of 480-volt circuit breakers before surveillance testing was performed. The NRC staff identified this as an example of unacceptable preconditioning, a concern addressed in NRC Confirmatory Action Letter issued on July 1, 1994. Also identified was a surveillance procedure that contained instructions requiring technicians to inspect, clean and lubricate several breakers before performing the "as-found" testing of several breaker functions. Since these functions (e.g., trip force of the operating mechanism, undervoltage trip, time delay attachments, etc.) could have been affected by the cleaning and lubrication, the test results did not represent the as-found condition of the breakers. Subsequently the NRC staff evaluated the effectiveness of the licensee's corrective actions in response to these preconditioning issues. In order to address this violation, the licensee had reviewed over 6,400 procedures, including maintenance procedures, and found approximately 168 procedures that contained potential preconditioning activities. The inspectors verified that the licensee had revised these procedures to address these concerns.

Aug 1995 Grand Gulf Nuclear Station - NRC IR 50-416/95-21 identified that the containment and drywell hydrogen analyzer calibration surveillance procedure required technicians to check reagent gas flow below calibration of the analyzer and to make an adjustment, if necessary, to the previous test value before obtaining the "as-found" calibration data. Since adjusting the reagent gas flow could change the as-found condition of the analyzer and invalidate the surveillance test results, the inspectors determined that the test procedure was inadequate and cited it as a violation of Tech

Specs which requires that specific written procedures be established for surveillance tests as described in Regulatory Guide 1.33, "Quality Assurance Program Requirements."

June 2010 LaSalle Station - NRC Integrated Inspection Report 05000373/2010003; 05000374/2010003, During a followup review of Task Interface Agreement 2009-006 "Unacceptable Preconditioning of Safety-Related Pressure Switches During Required Surveillance Testing at Montcello" issued by the NRC in September 2009, the inspectors identified that the licensee's surveillance testing procedures established a methodology which tested various safety-related pressure switches in a manner which was deemed unacceptable preconditioning by the NRC. In particular, the inspectors noted that during the LIS-MS-101A(201A) procedure, "Unit 1(2) Main Steam Line Low Pressure MSIV Isolation Calibration in Run Mode" Revision 5, the pressure switches in question were initially subject to main steam pressure. In accordance with the surveillance procedure, the inspectors noted that the basic testing methodology associated with these pressure switches was as follows: 1) isolate the pressure switch to be tested; 2) uncap the test connection; 3) connect the test equipment to the test connection; 4) increase the pressure until the pressure switch resets and record the reset test data; 5) bleed off the pressure until the pressure switch trips and record the as-found trip setpoint;
6) remove the test equipment and restore the pressure switch to operation. This testing methodology caused the pressure switch and associated contacts to change state when the system pressure was relieved in Step 2; again when pressure was applied to reset the pressure switch in Step 4; then a third time when the pressure was bled off to obtain the as-found trip setpoint in Step 5. This testing methodology subjected the pressure switch to a maximum pressure differential (operating pressure to atmospheric) and fully cycled the pressure switch prior to obtaining the as-found trip setpoint data. This particular surveillance was most recently performed on unit 1 MSIV pressure switches on April 16, 2010, and on unit 2 MSIV pressure switches on June 11, 2010. The inspectors review also identified that no engineering justification had been performed by the licensee to show that testing of these pressure switches in the above 11 Enclosure manner did not impact the accuracy and reliability of the safety-related pressure switches.
The inspectors noted that the existing licensee pressure switch testing methodology ensured operability of the pressure switches subsequent to the performance of the applicable surveillance test, since the required as-left pressure switch setpoint was adjusted (if required) prior to the completion of the surveillance. The inspectors determined that the existing testing methodology potentially masks existing conditions; such as sticking contacts, mechanical binding, and setpoint drift; and could mask existing operability concerns because the pressure switch is fully cycled prior to obtaining the as-found trip setpoint data.

February 2004 Columbia Generating Station - On February 19, 2004, Energy Northwest performed an IST test of the Standby Liquid Control (SLC) system. A procedure step required that each trains' SLC pump suction isolation valves, SLC-V-1A and SLC-V-1B, be stroke timed opened and then closed to satisfy IST testing requirements. The test

required a local operator to use a test control switch for the timing of each valve. The inspectors noted that per system design that the test control switch actuated both valves simultaneously and that the procedure always required Valve SLC-V-1A to be timed prior to Valve SLC-V-1B. The inspectors determined that the actuation of Valve SLC-V-1B (during Valve SLC-V-1A's timing test) prior to its own timing test to be preconditioning. The inspectors determined that since the preconditioning of Valve SLC-V-1B could mask the as-found condition of the valve and that the preconditioning was not required for the protection of personnel or equipment, nor needed to meet manufacturer's recommendations, that the preconditioning was unacceptable.

November 2003 Fitzpatrick Nuclear Plant - NRC IR 5000333/2003009 - Test procedure "HPCI Quick-Start, Inservice, and Transient Monitoring Test", operates four motor operated valves from their normal standby positions. After repositioning these valves, a subsequent step in the procedure directs the stroking and timing of the valves. In each case the second operation of the valve is recorded as the in-service test (IST) program credited test after the valve has already been operated. Thus, these valves are not stroke timed in their "as-found" position, from which they would be called upon to actuate in the event of an accident. The inspector reviewed several copies of the completed procedure where this preconditioning was performed, including the most recently completed test procedure. In all instances reviewed, the valves operated within the required IST program times. However, the testing under this procedure, preconditions (exercises) each of these valves before the operating times are recorded. NOTE: Per this position paper the activity described above would not constitute unacceptable preconditioning. The lesson learned from this OE is that each station needs to have adequate documentation which evaluates such activities.

References:

1. The Code; For the purposes of this position, the term "Code" includes those ASME Standards and Codes incorporated by reference in the NRC's regulations, Title 10, Code of Federal Regulations, Part 50, Section 50.55a as of, and prior to, the approval date of this position.
2. USNRC Inspection Manual Part 9900: Technical Guidance, "Maintenance - Preconditioning of Structures, Systems and Components before determining Operability". Published 9/28/1998
3. NUREG-1482, Revision 1, Guidelines for Inservice Testing at Nuclear Power Plants, Final Report, Published January 2005, Prepared by S. M. Unikewicz, NRC Project Manager, Division of Engineering, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission
4. USNRC Information Notice, IN 97-16, Preconditioning of Plant Structures, Systems, and Components Before ASME Code Inservice Testing or Technical Specification Surveillance Testing

Revision History:

May 30, 2006	Revision 0 submitted for ISTOG review and approval by Wavel L. Justice, Engineering Programs, Entergy Nuclear, Jackson Mississippi, with significant input from ISTOG Steering Committee members, both past and present.
February 28, 2011	Revision 1 submitted for ISTOG Steering Committee approval by E. Cavey following significant input from various ISTOG members. Revision 1 was approved by a vote of the Steering Committee as of 28 February, 2011.