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Indiana Michigan Power
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
AEP.com

July 25, 2007

AEP:NRC:7331-01
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
Response to Request for Additional Information Regarding Technical Specification Change to Reactor Trip System Instrumentation and Engineered Safety Feature Actuation System Instrumentation

References:
1. Letter from M. A. Peifer, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Technical Specification Change to Reactor Trip System (RTS) Instrumentation and Engineered Safety Feature Actuation System (ESFAS) Instrumentation," AEP:NRC:6331-04, dated September 15, 2006 (ML062710309).
2. Letter from P. S. Tam, NRC, to M. K. Nazar, I&M, "D. C. Cook Nuclear Plant (DCCNP), Units 1 & 2 – Request for Additional Information Regarding Proposed Amendment Involving Bypass Testing Capability of Certain Instrumentation (TAC MD3159 and MD3160)," dated June 18, 2007 (ML071650508).

Dear Sir or Madam:

By Reference 1, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposed to amend Facility Operating Licenses DPR-58 and DPR-74. I&M proposed to modify Technical Specifications (TS) to adopt NUREG-1431, Revision 3, "Standard Technical Specifications, Westinghouse Plants," wording in TS 3.3.1, Reactor Trip System Instrumentation, and TS 3.3.2, Engineered Safety Feature Actuation System Instrumentation, for plants with installed bypass test capability. I&M has installed the first phase of a modification for bypass test capability in Unit 1 and Unit 2 for some TS Functions other than those for the Nuclear Instrumentation System (NIS). Bypass test capability for NIS Functions will be installed during the second phase of the modification. I&M is planning to install the second phase in Unit 2 during the Spring 2009 outage and in Unit 1 during the Fall 2009 outage, which represents a change from the planned installation of the second phase identified in Reference 1. Therefore, a change in the implementation is requested by this letter. By Reference 1, license amendment implementation was requested to be completed in two stages. The first stage of implementation consists of TS 3.3.1,

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Condition D and Condition Q, and TS 3.3.2, Condition D, and will be implemented within 45 days of approval. No change is requested in implementing the first stage. The second stage of implementation consists of TS 3.3.1, Condition C, and will be implemented in Unit 2 after the Cycle 18 outage (Spring 2009) and in Unit 1 after the Cycle 23 outage (Fall 2009). Therefore, I&M requests implementation of the second stage based on the new schedule for installation.

Reference 2 requested a response to the request for additional information (RAI) within 30 days. A revised date was discussed with the Nuclear Regulatory Commission (NRC) Project Manager in a telephone conversation on July 16, 2007. It was agreed that I&M would respond to the RAI by July 25, 2007.

Enclosure 1 provides an affirmation statement pertaining to this letter. Enclosure 2 provides I&M's response to the RAI provided by the NRC by Reference 2. This response remains within the scope of the amendment previously proposed by Reference 1. Therefore, the No Significant Hazards Consideration evaluation and the evaluation of Environmental Considerations provided in Enclosure 2 to Reference 1 continue to bound the proposed changes.

Copies of this letter and its enclosures are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality in accordance with the requirements of 10 CFR 50.91.

There are no commitments made in this letter. Should you have any questions, please contact Ms. Susan D. Simpson, Regulatory Affairs Manager, at (269) 466-2428.

Sincerely,

Joseph N. Jensen
Site Vice President

KS/rdw

Enclosures:

1. Affirmation
2. Response to Request for Additional Information

c: J. L. Caldwell, NRC Region III
K. D. Curry, AEP Ft. Wayne
J. T. King, MPSC
MDEQ – WHMD/RPMWS
NRC Resident Inspector
P. S. Tam, NRC Washington, DC

Enclosure 1 to AEP:NRC:7331-01

AFFIRMATION

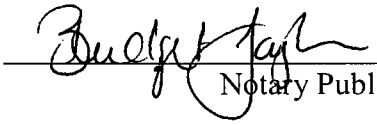
I, Joseph N. Jensen, being duly sworn, state that I am Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Joseph N. Jensen
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 25th DAY OF July, 2007



Notary Public

My Commission Expires 6/10/2013

Enclosure 2 to AEP:NRC:7331-01

By Reference 1, Indiana Michigan Power Company (I&M) proposed to modify Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2 Technical Specifications (TS) to adopt NUREG-1431, Revision 3, "Standard Technical Specifications, Westinghouse Plants," (STS) wording in TS 3.3.1, Reactor Trip System (RTS) Instrumentation, and TS 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, for plants with installed bypass test capability.

I&M has installed the first phase of a modification for bypass test capability in Unit 1 and Unit 2 for some TS Functions. Bypass test capability for the Nuclear Instrumentation System (NIS) TS Functions is planned for the second phase of the modification. The modification provides the capability to place certain RTS and ESFAS channels in bypass with installed switches without the use of jumpers or lifting leads. The first phase of the modification provides the installed bypass test capability on certain RTS and ESFAS channels through connection of bypass switches installed in conjunction with the existing test switches. These test switches are part of the Protection System, which provides input to the automatic actuation logic for the RTS and ESFAS, and are used for the testing of RTS and ESFAS channels.

During a telephone conference held between I&M and Nuclear Regulatory Commission (NRC) staff on June 20, 2007, I&M agreed to provide a schematic of the Protection System and the test circuitry that has been modified. Figure 1 identifies a schematic of the Protection System with the section representing the test switch annotated. This area is represented in more detail by Figure 2, as the test circuitry looked before the modification, and Figure 3, after installation of the modification. Two reactor coolant system (RCS) loop flow reactor trip functions in Channel II are represented in Figures 2 and 3. Since, in most cases, the RTS and ESFAS channels are de-energized to trip, if one of the switches represented in Figure 2 were put into test, it would send a trip signal to both Train A and Train B of the solid state protection system (SSPS) equipment for that channel function.

The modification is designed to require two independent manual switch actuations to place a channel in bypass. There is no automatic actuation associated with this bypass circuit. Figures 2 and 3 show that the existing test switches have four poles of double throw switch contacts. The first pole of the switch, which is not changed by the modification, is used to disconnect the bistable signal from the SSPS and connect it to a test light for monitoring the bistable operation during testing. The first pole would cause the channel to become de-energized, sending the trip signal to both trains for that channel function. The third and fourth poles of the test switch, which also are not changed by the modification, are used in the test sequence alarm. Figure 3 shows that the second pole of the switch was modified such that, when a test switch is placed into test, one channel function output to the SSPS trains would be connected to the bypass switch. If the Locking Bypass Switch were placed into bypass by use of a key controlled by the Operations Department, an energized signal would be applied to the input of the SSPS trains, thereby continuously providing power to the channel function, indicating a non-tripped condition. The Locking Bypass Switch is connected to status lights to provide indication both locally and in the control room when a channel bypass switch is armed.

When the second phase of the modification is installed for the NIS bypass circuitry, it will be designed equivalent to the standards used for the first phase. NIS bypass panels are to be obtained through Westinghouse, with documentation on the qualification and conformance to applicable safety and licensing criteria.

By Reference 2, the NRC transmitted a request for additional information (RAI) regarding the Reference 1 license amendment request. On March 26, 2007, I&M and NRC staff discussed the draft RAI and again on June 20, 2007, I&M and NRC staff discussed the Reference 2 RAI by telephone conference. The requested information is provided below.

NRC Comment 1

The most notable omission was the lack of information on the changes to the RTS and ESFAS systems to include the bypass capability. Page 5 of the submittal, titled Technical Analysis, states that: "Hardware changes necessary to be made to the NIS [nuclear instrumentation system] and Foxboro analog/digital protection system to facilitate testing in bypass will be implemented in accordance with 10 CFR 50.59."

NRC Comment 1, Item 1

The application did not address how the modified RTS and ESFAS meet NRC's requirements for systems at 10 CFR 50.55a(h), which endorses IEEE Standards 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," and 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations."

I&M Response to Comment 1, Item 1

The Protection System, including the installed bypass test capability, is designed in accordance with the intent of the requirements of the proposed IEEE Standard 279, dated August 1968, as reflected in Updated Final Safety Analysis Report (UFSAR) Section 7.2.1. The CNP 10 CFR 50.59 Program uses the industry guidance document NEI 96-07, Revision 1, which has been endorsed by the NRC through Regulatory Guide 1.187. The UFSAR-described design functions discussed in the 10 CFR 50.59 review for the modification installing bypass test capability at CNP are those functions that provide a reactor trip, functions that provide Engineered Safety Features Actuations, functions that provide an operating system bypass, and rod stop, average RCS temperature (Tavg)-Low, and turbine runback functions. The 10 CFR 50.59 review for the modification evaluated the design against the UFSAR and determined that there is no adverse affect on the UFSAR-described design functions. IEEE Standard 603-1991 is not part of the CNP design and licensing basis.

NRC Comment 2
Accordingly, the following major design considerations need to be addressed in the submittal:

NRC Comment 2, Item 1
Design basis

I&M Response to Comment 2, Item 1
CNP processes governing plant modifications ensure quality components are used, single failure considerations accounted for, and independence, diversity, and testability of components is provided. The first phase of the modification has been evaluated and determined to have no impact on the normal operation of the RTS or ESFAS, when channel testing is not in progress. The previous design used test switches (see Figure 2) to assist in performance of channel testing. The installed bypass test capability is only possible when these test switches are placed into test, while the Locking Bypass Switch (see Figure 3) is placed into bypass. The 10 CFR 50.59 review completed for the modification determined that there is no adverse affect on the UFSAR-described design functions. There are plans to make the test switches capable of make-before-break for the first phase of the modification and use Westinghouse bypass panels for the NIS for the second phase of the modification. I&M is confident that these plans will also have no impact on the UFSAR-described design functions discussed in NRC Comment 1, Item 1. The make-before-break switches will allow seamless switching to bypass a channel without bringing in a trip signal, while the bypass panels for NIS will perform the same function as the switch design used for the first phase of the modification.

NRC Comment 2, Item 2
Single-failure criterion

I&M Response to Comment 2, Item 2
Channel operation without the channel in test (or bypassed) has not impacted single failure as compared to the design without the installed bypass capability. It would take the simultaneous failure of two passive switches to cause the bypass of just one channel. Therefore, single failure criterion is maintained for the Protection channel operation.

NRC Comment 2, Item 3
Quality of components and modules

I&M Response to Comment 2, Item 3
The components added by the modification to install bypass test capability are qualified commensurate with their use as nuclear grade equipment. Therefore, the bypass switch itself is nuclear grade. Both the Protection System bypass switch and the make-before-break switches were verified to be seismically qualified by the performance of seismic qualification tests as documented in the manufacturers Seismic Qualification test reports.

Both reports certify that the testing program was in compliance with 10 CFR Part 50 Appendix B. In addition, both reports reference IEEE 344-1975/1987, "IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations." These reports were verified by CNP personnel to insure the testing enveloped the requirements of the installed switches.

NRC Comment 2, Item 4
Independence

I&M Response to Comment 2, Item 4
The CNP UFSAR discusses independence in terms of channel independence. The installed bypass test capability will allow normal channel operation to remain the same. In addition, there are separate bypass switches for each channel which are completely independent from the other channels.

NRC Comment 2, Item 5
Defense-in-depth and diversity

I&M Response to Comment 2, Item 5
The NRC glossary describes defense-in-depth, in part, as a design and operational philosophy with regard to nuclear facilities that calls for multiple layers of protection to prevent and mitigate accidents. It includes the use of controls ... redundant and diverse key safety functions... The CNP UFSAR discusses diversity in terms of monitoring numerous system variables by different means. Channel operation without the use of the channel in test remains the same, with no input variable eliminated by the modification. Redundancy and diversity of safety functions remain unchanged.

NRC Comment 2, Item 6
System testing and inoperable surveillance

I&M Response to Comment 2, Item 6
The modification provides the capability to bypass an inoperable channel with an installed bypass capability rather than with jumpers or lifted leads. When CNP personnel start performing testing in bypass, it will be as described in Section 7.2 of WCAP-15376, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," where it states that "The channels can be tested and maintained in either the bypassed or tripped state depending on the specific plant hardware capability. If tested in the bypassed state, the channel is unavailable and actuation logic changes from 2 of 3 to 2 of 2 or from 2 of 4 to 2 of 3, depending on the initial logic requirement." Section 8.3.2.1 of WCAP-15376 also assumes the testing and calibration activities are performed in the bypassed state. WCAP-15376 has been approved by the NRC for referencing in license applications for increasing the completion time and bypass time for reactor trip breakers, as well as various surveillance

test intervals for instrumentation. By Reference 3, CNP has received approval for TS changes supported by WCAP-15376.

NRC Comment 2, Item 7
Use of digital systems

I&M Response to Comment 2, Item 7
The modification to install bypass test capability has not made a change to the Foxboro Spec 200 Micro digital system, which provides the channel bistables for actuating RTS or ESFAS. There have been no changes to any software or programming of the digital components. The NIS is not a digital system.

NRC Comment 3
Specifically, the application did not provide information showing how the RTS and ESFAS systems, as modified with bypass capability, continue to meet regulatory requirements. Also, the application does not state that you have done the failure mode and effects analysis to determine if the failure of bypass system will not have any impact on accident analyses, or would not create new potential accidents. The current DCCNP licensing basis does not include any mass addition transients or accidents. As such, a change in the ESFAS or RTS system that creates the possibility for an inadvertent injection of water into the reactor coolant system (such as the inadvertent start of a charging pump), would require the licensing basis to include mass addition transients in the DCCNP licensing basis. If the licensing basis did not include these transients, neither the licensee nor the NRC could conclude that the proposed change poses no safety concern.

I&M Response to Comment 3
As stated in response to Comment 1, regulatory requirements are met since the Protection System, including the installed bypass test capability, is designed in accordance with the intent of the requirements of the proposed IEEE Standard 279, dated August 1968. A formal failure modes and effects evaluation has not been performed; however, failure modes and effects are addressed by the fact that channel operation without the channel in test (or bypassed) is the same as in the previous design. The failure mode of a channel in test and bypassed would be the loss of power to the channel, causing it to be in the tripped condition. A channel in test, while not bypassed, is already in the tripped condition and the failure mode is no different than the previous design. The 10 CFR 50.59 review concluded there were no adverse affects on UFSAR-described design functions. The bypass capability can only be armed with a key lock bypass switch and then a channel will only be bypassed if its test switch is put in test. There are control room indications when bypass capability is armed. It would take the failure of two passive switches to cause the bypass of just one channel, so there is no change to the accident analysis. Therefore, the modification does not create the possibility for an inadvertent injection of water into the RCS.

NRC Comment 4

In addition, there was no discussion on the brand and type of system, or the method used for the qualification of this system.

I&M Response to Comment 4

The modification installing bypass test capability does not create a new system. It modifies the existing test switches to provide the bypass capability. Eaton/Cutler-Hammer locking hand switches were used for the bypass switches in each channel. The existing test switches will be replaced in the future with make-before-break switches from Electroswitch. Review of the qualification test reports or third party testing was performed to verify the qualification of the switches.

References

1. Letter from M. A. Peifer, I&M, to NRC Document Control Desk, "Technical Specification Change to Reactor Trip System (RTS) Instrumentation and Engineered Safety Feature Actuation System (ESFAS) Instrumentation," AEP:NRC:6331-04, dated September 15, 2006 (ML062710309).
2. Letter from P. S. Tam, NRC, to M. K. Nazar, I&M, "D. C. Cook Nuclear Plant (DCCNP), Units 1 & 2 – Request for Additional Information Regarding Proposed Amendment Involving Bypass Testing Capability of Certain Instrumentation (TAC Nos. MD3159 and MD3160)," dated June 18, 2007 (ML071650508).
3. Letter from J. F. Stang, NRC, to A. C. Bakken III, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments (TAC Nos. MB6324 and MB6325)," dated May 23, 2003 (ML031320614).

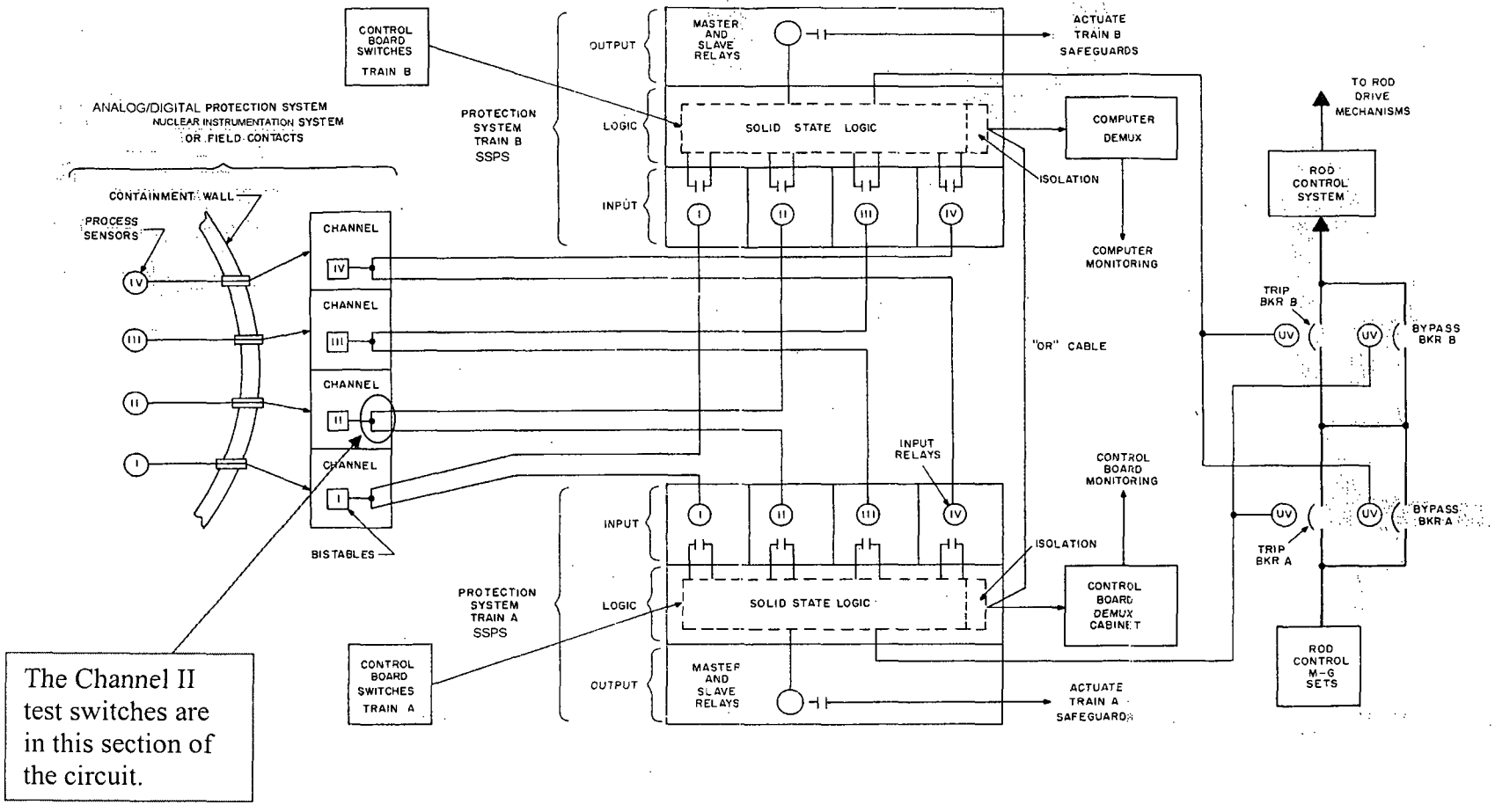

CONTROL BOARD SWITCHES TRAIN B
ANALOG/DIGITAL PROTECTION SYSTEM
NUCLEAR INSTRUMENTATION SYSTEM
OR FIELD CONTACTS
CONTAINMENT WALL
PROCESS SENSORS
CHANNEL
CHANNEL
CHANNEL
CHANNEL
BISTABLES
PROTECTION SYSTEM TRAIN B SSPS
OUTPUT
MASTER AND SLAVE RELAYS
LOGIC
SOLID STATE LOGIC
INPUT
ACTUATE TRAIN B SAFEGUARDS
COMPUTER DEMUX
ISOLATION
COMPUTER MONITORING
"OR" CABLE
INPUT RELAYS
CONTROL BOARD MONITORING
PROTECTION SYSTEM TRAIN A SSPS
CONTROL BOARD SWITCHES TRAIN A
CONTROL BOARD DEMUX CABINET
ACTUATE TRAIN A SAFEGUARDS
TO ROD DRIVE MECHANISMS
ROD CONTROL SYSTEM
TRIP BKR B
BYPASS BKR B
TRIP BKR A
BYPASS BKR A
ROD CONTROL M-G SETS
The Channel II test switches are in this section of the circuit.

Figure 1

Before Installation of Bypass Test Capability

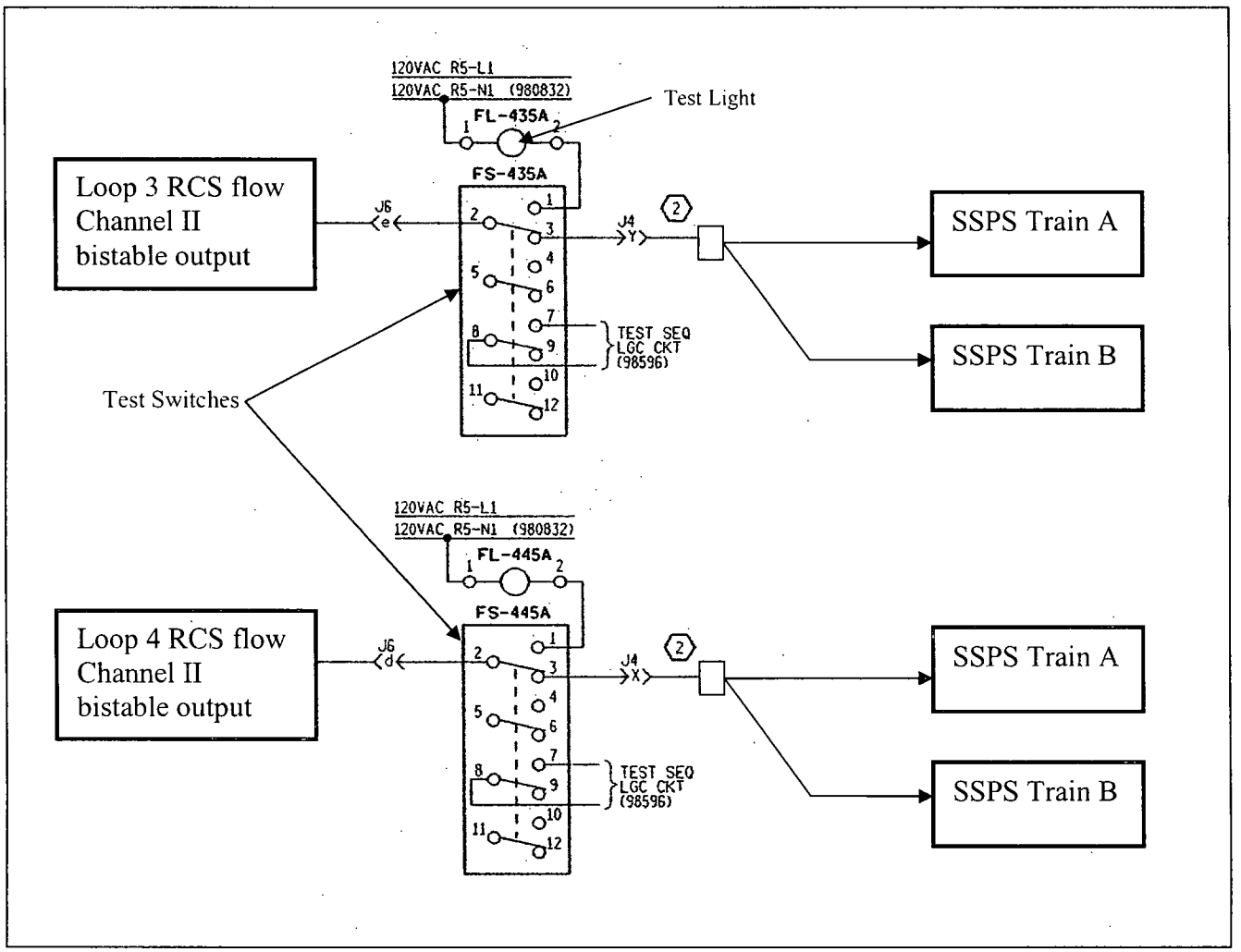


Figure 2

After Installation of Bypass Test Capability

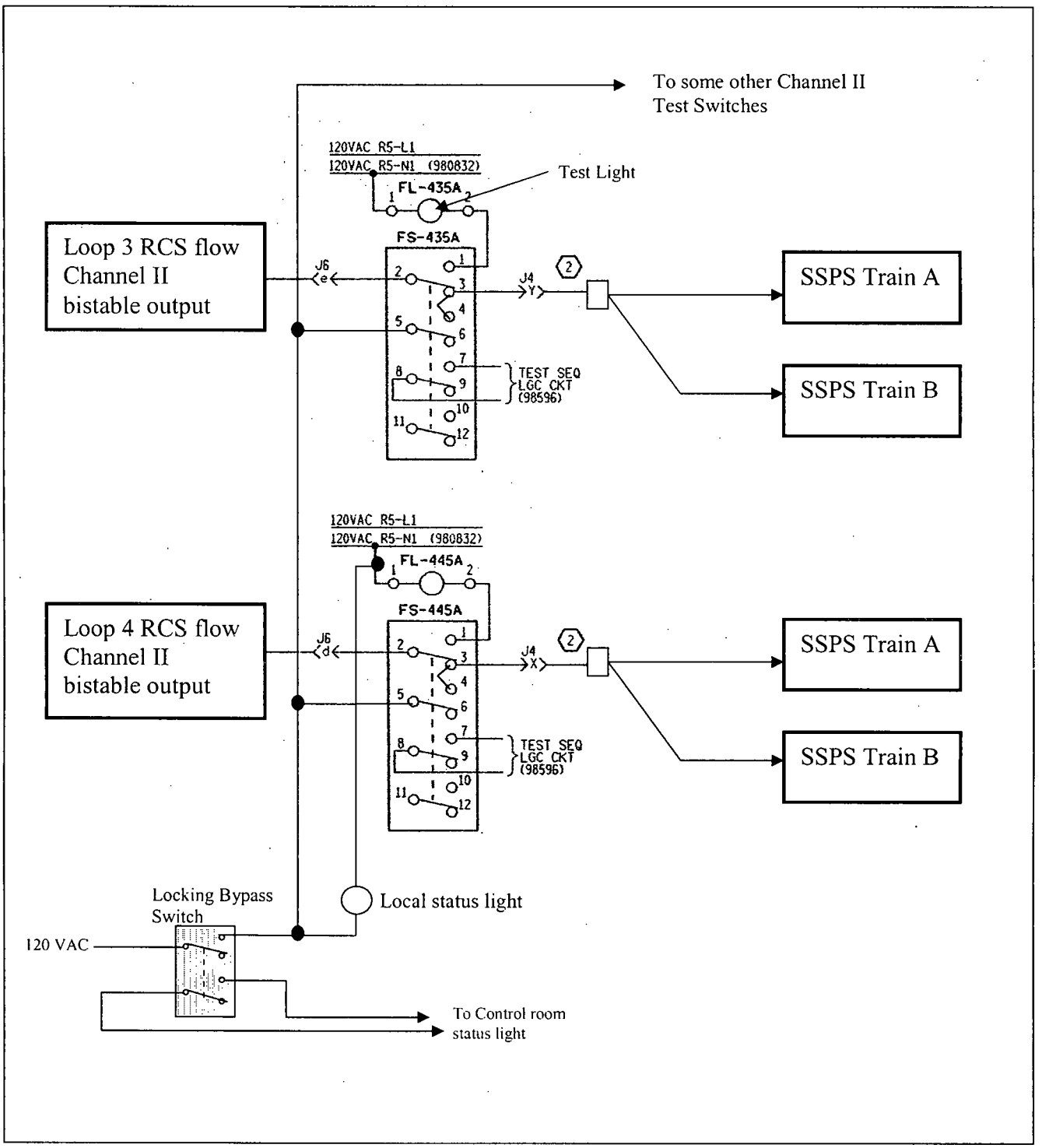


Figure 3