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Saul Levine, Assistant Director for Reactor Technology, DRL  
THRU: Voss Moore, Chief, Instrumentation & Power Technology Branch, DRL

MINUTES OF MEETINGS WITH CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.,  
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2, DOCKET NO. 50-247

Summary

Meetings were held with Consolidated Edison Company (Con Ed) on December 10 and 30, 1969. Attendance lists are attached.

The purpose of the meetings was to review the schematic diagrams of the instrumentation and power systems. Where the schematics were not self-explanatory, an explanation of the circuit's operation was requested. In general, these explanations were given by Westinghouse rather than Con Ed. Other items discussed concerned areas where the schematics appeared to be incorrect, disagreed with information in the FSAR, or the design appeared not to meet IEEE 279. Where errors do exist, the applicant has agreed to submit corrected schematic diagrams and/or to revise the FSAR. The applicant stated that the revisions to the FSAR will be limited to correction of existing errors and that no additional information will be added to the FSAR unless it is formally requested. In cases where the diagrams are correct but the design appears not to meet IEEE 279 criteria, Con Ed stated that they would review the design and be prepared to discuss it in the future.

While we expect these actions to resolve most of the problem areas, we remain concerned about errors in schematic diagrams. Schematics revised as recently as December 10, 1969, and labeled "Revised per as built changes," contain errors. Westinghouse stated that they are sure the actual equipment is not wired incorrectly and that the errors are only drafting ones. Further, Westinghouse stated that they probably never would have found some errors had we not found them. We stated that, for the purpose of our review, we must assume that the schematics are an exact representation of the plant equipment. We informed Con Ed that we will schedule our next meeting, to complete the drawing review, approximately one week after receipt of correct schematic diagrams.

Details of the discussions are given below. Unresolved items are identified by an asterisk and will be discussed at our next meeting.

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1. Offsite Power

- \*a. Con Ed stated that they saw no safety significance in the fact that the Buchanan substation is not under the control of the Indian Point operators and that faults are alarmed in the West End Avenue (New York City) office and not at the site.
- b. Con Ed stated that, because of low hydrogen generation, natural convection provides adequate ventilation for the switchyard batteries.
- c. The trip coils of switchyard breakers are supplied via automatic transfer switches from either of the two switchyard batteries. Breakered feeders are provided for each transfer switch and each switch supplies only one load.
- d. The applicant stated that he takes no credit for backfeed through the main Unit 2 transformers as a source of offsite power.

2. Onsite Power

- a. As a result of the design changes made to the automatic breaker sequencing, several statements in the FSAR are now incorrect. The pages which will be revised include: 7.2-8, 7.2-9 and 8.2-4.
- b. Fuel oil storage capacity is sufficient for operation of two diesels for 80 hours. If commercial resupply is not immediately available, Con Ed can use their own tank trucks to bring in fuel or to move the gas turbine fuel to the diesel fuel storage tanks.
- c. The diesels are automatically started by an UV condition on either bus 5 or bus 6 or by a SI signal. After one automatic start cycle, the starting sequence is locked out to insure sufficient starting air remains for several manually initiated starts. FSAR Pages 7.2-9 and 8.1-3 will be corrected and Pages 8.2-10 and 8.2-12 will be clarified.
- \*d. D-C control power for buses 5A, 2A, 3A and 6A switchgear is supplied via automatic transfer switches from the two unit batteries. Unlike the switchyard transfer switches, all four switches are supplied via the same two d-c feeders. We pointed out that a fault in one switch could cause both feeder breakers to trip and result in a loss of control power to all 480 vac switchgear.

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- e. Figure 8.2-5 of the FSAR shows that all three diesel generator crank case exhausters are powered from one bus. This figure will be revised since the three exhausters now receive power from three different sources.
- f. Although only one damper is provided specifically for diesel combustion air supply, failure of this damper to open would not be a problem since at a differential pressure of 1" water there will be sufficient air leakage into the diesel building for all three diesels. The remaining dampers are temperature controlled.
- \*g. Several problems associated with the load shedding and SI loading sequence circuitry (U.E. & C. Dwg. Nos. 9321-LL-3117 and 9321-LL-3118) were discussed:
  - (1) Modification to the circuitry has resulted in several relay coils being disconnected; contacts of these relays remain wired into the circuits. Con Ed will investigate.
  - (2) These circuits are normally de-energized. There appear to be no provisions for detecting a loss of power to these circuits.
  - (3) Two redundant, but not independent, sequencing circuits are provided. Because of the interconnections, the circuits do not appear to be readily testable. Con Ed stated that they intend to be able to test the circuits at power but no test procedures have been developed yet.
- h. Portions of the diesel generators' control circuitry is supplied via three automatic transfer switches. Although the three switches are supplied from two common d-c feeders, the loads appear to be sufficiently protected by fuses to preclude the loss of control power to all diesels from a single fault.
- i. The applicant agreed to update FSAR Figure 9.6-1 with respect to diesel cooling water.
- j. Page 8.1-2 of the FSAR, "Emergency Power Criterion," uses the words "failure of a single active component." The applicant agreed to delete the word "active."

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- k. Considerable discussion on cable routing took place. It is apparent that although Con Ed has checked the routing of many cables against the cable run lists, no one has checked to ensure redundant cables are routed separately. The computer program initially used to provide the cable lists was not programmed to reject on redundant cables assigned to the same tray. U.E. & C had to discontinue use of the computer for routing of cables outside containment and has been preparing the cable lists manually.
  - l. Con Ed stated that two more gas turbines are to be installed on the Indian Point site. We requested that they be prepared to supply the starting history of the gas turbine presently installed on the site at our next meeting.
  - m. To aid in evaluating the consequences of the Unit 1 stack falling on the Unit 2 control room, we requested that the applicant be prepared to discuss the extent to which local control of the diesels would be affected by loss of the control room.
3. Engineered Safety Features (Westinghouse Dwg. Nos. 110E089 and 499B444).
- a. FSAR Page 6.2-6 incorrectly states the Containment Spray actuation logic and will be revised.
  - b. Boron Injection Tank (BIT) discharge valves.
    - (1) FSAR Page 6-2-7 and Figure 6.2-1 disagree regarding tank level instrumentation and will be revised.
    - \* (2) Two of the three motor-operated valves receive power from a common source. A power failure between the time SI is actuated and the BIT empties will result in loss of suction to all three SI pumps.
    - \* (3) Con Ed agreed to supply schematic diagrams of the BIT level instruments when available. The partial valve control schematics presently available do not support the conclusion that the circuitry meets the single failure criterion.
  - c. FSAR Figure 6.3-1 does not incorporate recent changes to the sodium hydroxide tank valves and incorrectly states the automatic actuation logic. These changes will be incorporated in a revised figure.

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- d. Westinghouse stated that the SI logic test lights (Dwg. 110E089) are not visible to the operator and, therefore, will not confuse the operator. There are other lights which enable the operator to determine the cause of the SI signal.
  - e. Westinghouse Dwg. 499B444, which show the ESF equipment controllers, are in error because of changes to the sequencing circuitry. Revised diagrams will be submitted.
  - \*f. The design of the instrument bus power supplies is such that a SI signal or an UV condition on bus 2A results in the loss of one instrument bus. (MCC 24 which supplies the bus is in the load shedding sequence). While the reasons for this design are not apparent, it appears that the design will meet IEEE 279 provided that the three containment pressure instruments receive power from three other sources.
  - \*g. The ESF logic circuit design allows the operator to reset the master actuating relays. Since the reset operation blocks subsequent automatic actuation of the system until the original initiating signal clears, we questioned the applicant and Westinghouse about the criteria used in this design. Westinghouse stated that it is not necessary to perform the reset operation until the system is to be stopped or the SI system is changed to the recirculation mode.
  - \*h. Test procedures and acceptable resistance values have not yet been specified for the continuity checks of the master and slave relay coils. We also pointed out to the applicant that these continuity tests do not check relay contact operation.
4. Reactor Protection System (Westinghouse Dwg. Nos. 110E073).
- a. FSAR Page 7.2-25 and Table 7.2-2 are incorrect with respect to P-7 interlock logic and will be revised.
  - b. FSAR Table 7.2-1 is incorrect regarding low feedwater flow trip and containment spray actuation; it will be revised.
  - c. Dwg. 110E073, Sheet 2, has contacts in the IR reactor trip circuit labeled incorrectly.
  - d. The reactor trip bypass breakers will be interlocked to prevent both bypass breakers being closed simultaneously. FSAR Page 7.2-19 will be revised.

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- \*e. Westinghouse stated that the SI reactor trip relays are independent and redundant (110E073, Sheet 5). We pointed out that the SI schematics (110E089, Sheet 4) assigned only two contacts to the reactor trip circuits which implies that this circuitry is common to both reactor trip chains.
- f. We pointed out several areas where references on Drawings 110E089 do not agree with Drawings 110E073. Revised drawings will be submitted.
- g. Manual reactor trip (1/2) circuits cannot be tested at power since each circuit trips both main and both bypass reactor trip breakers.
- \*h. Opening of any RPS cabinet door is annunciated at the control board by a common alarm. Previous designs have provided an individual annunciator for each of the four protection channels. Westinghouse stated that, since the cabinets are located in the control room, no alarms are necessary. In fact they believe that the existing alarm should be removed.

Original  
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R. D. Pollard  
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RT-959A  
DRL:I&PTB:RDP/ODP

- Enclosures:
1. Attendees 12/10/69
  2. Attendees 12/30/69

bcc: V. Moore  
O. Parr  
R. Pollard

Distribution:  
Suppl.  
DRL Reading  
AD/RT Reading  
I&PTB Reading

- cc w/encl:
- P. A. Morris
  - F. Schroeder
  - R. S. Boyd
  - D. J. Skovholt
  - R. C. DeYoung

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SURNAME ▶		RPollard <i>RP</i>	OParr <i>OP</i>	V Moore <i>VM</i>		
DATE ▶		1/8/70	1/8/70	1/12/70		

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INDIAN POINT NO. 2 MEETING - 12/10/69

ATTENDEES

W

V. V. Kirilloff  
R. Cooney  
B. Nelson  
H. Skow  
R. F. Druine  
A. S. Simmons  
Peter L. Walker

Con Edison

J. Blake  
F. G. Flugger  
Frank E. Fischer  
William C. Dumper

U.E. & C

W. P. Robinson  
J. G. Kritikson

CO:HQ

V. D. Thomas

DRL

Robert Pollard  
Dom Tondi  
O. D. Parr  
\*Karl Kniel  
\*M. McCoy

\*Part-time attendance

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INDIAN POINT NO. 2 MEETING - 12/30/69

ATTENDEES

W

V. V. Kirilloff  
O. M. Hauge  
H. N. Skow  
J. J. Dombrowski  
E. J. Staffel  
A. A. Simmons (Pitts.)

Con Edison

F. Flugger  
J. J. Blake  
Charles Jackson  
Frank E. Fischer  
William C. Dumper

U.E. & C

W. P. Robinson  
J. G. Kritikson

CO

G. L. Madsen  
V. Thomas

DRL

R. Pollard  
O. D. Parr  
\*C. F. Miller  
D. Tondi  
\*K. Kniel  
\*M. McCoy

\*Part-time attendance