

JUL 13 1981

MEMORANDUM FOR: Darrell G. Eisenhut, Director  
Division of Licensing

FROM: G.C. Lainas, Assistant Director  
for Safety Assessment  
Division of Licensing

SUBJECT: SUMMARY OF THE OPERATING REACTOR EVENTS MEETING  
ON JULY 8, 1981

On July 8, 1981, an Operating Reactor Event meeting was held to brief the Office Director, the Division Directors, and their representatives on events which occurred since the last meeting. The list of meeting attendees is included as Attachment 1.

The events discussed and the significant elements of these events are presented in Attachment 2. In addition to these events, the assignment of follow-up review responsibility was discussed. The assignments made during this meeting and the status of previous assignments are presented in Attachment 3.

The next Operating Reactor Events meeting is scheduled for July 15, 1981.

G.C. Lainas, Assistant Director  
for Safety Assessment  
Division of Licensing

Attachments:  
As stated

cc w/attachments:  
Meeting Attendees

- |              |              |
|--------------|--------------|
| ORAB Members | G. Zech      |
| H. Denton    | T. Novak     |
| E. Case      | G. Lainas    |
| R. Mattson   | R. Tedesco   |
| R. Vollmer   | J. Olshinski |
| S. Hanauer   | G. Holahan   |
| T. Murley    | H. Thompson  |

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OFFICE	DL:ORAB	DL:ORAB/ST	DL:ORAB/BC	DL:AD/SA		
SURNAME	PFrahm:sah	GHolahan:sah	JOlshinski	GLainas		
DATE	7/11/81	7/12/81	7/10/81	1/81		

MEETING ATTENDEES

L. Engle  
D. Garner  
G.C. Lainas  
R. Purple  
J. Martore  
F. Schroeder  
R. Woods  
B. Mills  
G. Holahan  
M. Chiramal  
R. Baer  
E. Jordan  
A. Holland  
V. Benaroya  
E. Imbro  
J. Olshinski  
E. Case  
J.P. Knight  
T. Novak  
R. Mattson  
R. Fitzpatrick  
I. Ahmed  
W. Lanning  
R. Frahm

OPERATING REACTOR EVENTS MEETING

JULY 8, 1981

● SALEM UNIT 2 - JUNE 22 THRU JULY 7 - 9 REACTOR TRIPS

- 6/22 RX TRIP - DURING STARTUP - UNKNOWN
- 6/23 RX TRIP - LOW LOW S/G
- 6/24 RX TRIP - MFP TRIP
- 6/24 PX TRIP - S/G SV OPEN - LOW LOW S/G
- 6/26 RX TRIP - HI HI S/G
- 6/26 RX TRIP - LOW LOW S/G
- 6/27 RX TRIP - LOW LOW S/G - S.I.
- 6/28 RX TRIP - LOW LOW S/G
- 7/07 RX TRIP - FEED PUMP TRIP

NOTE: SALEM HAD 25 (16 + 9) REACTOR TRIPS DURING STARTUP FROM  
MAY 20 TO JULY 7, 1981

● DAVIS BESSE UNIT 1, 6/24/81 - REACTOR TRIP/LOSS CONTROL ROOM  
ANNUNCIATORS/LOSS I&C (NNI), RP (75% DUE TO OPERATING WITH 3  
RCPs)

- LOSS OF 480 VAC BUS
- REACTOR TRIP
- LOSS OF CONTROL ROOM ANNUNCIATORS
- LOSS NNI-Y
- NO ABNORMAL PLANT TRANSIENT
- POWER RESTORED IN 12 MINUTES
- REVIEW OF EVENT IDENTIFIED WIRING ERRORS ON NNI AND SATURATION  
METER

- NORTH ANNA POWER STATION, UNIT 1 & 2, JULY 3, 1981; TRANSFORMER FIRE, TURBINE/REACTOR TRIP, SPURIOUS SAFETY INJECTION-UNIT-2; UNIT 1 FP, UNIT 2 SD
  - B TRANSFORMER FAULT CAUSES FIRE
  - FIRE SPREADS TO COOLING OIL (69,000 LBS)
  - DAMAGE INTERRUPTS C TRANSFORMER SUPPLY TO 1C AND 2C SERVICE BUSES
  - INTERRUPT CAUSES LOSS-OF-POWER TO 1H AND 2J EMERGENCY BUSES
  - 2J AND 1H EMERGENCY DIESELS START AUTOMATICALLY
  - SI INJECTION RESULTED FROM REAL LOW-LOW-TAV COINCIDENT WITH SPURIOUS HIGH-STEAM-FLOW INITIATED BY UNDERVOLTAGE
  
- BROWNS FERRY, LEVEL INSTRUMENTATION PROBLEM (IE)
  - EQUALIZING VALVE LEFT OPEN
  - SCRAM ON TURBINE TRIP
  - HPCI AND RCIC DISABLED WITH ADDITIONAL SINGLE FAILURE
  
- PRATT PURGE VALVE ANALYSIS (IE)
  - RECOMMENDATION FOR PARTIAL OPENING OF THE VALVES
  
- FOLLOW-UP ON BRUNSWICK MSIV FAILURE (IE)
  
- MCGUIRE ELECTRICAL CONNECTOR TEST FAILURE (PM)

OFFICE OF INSPECTION AND ENFORCEMENT

Items of Interest

Week Ending June 26, 1981

1. The following Notification of Significant Enforcement Action was dispatched during the past week:
  - a. EN-81-07A Fort Hamilton-Hughes Memorial Hospital Center, Hamilton, OH - A Notice of Violation and Notice of Proposed Imposition of Civil Penalties in the amount of \$4,000 were previously issued to subject licensee (EN-81-07). The proposed penalties were based on alleged violations which involved: (1) failure to report a malfunction of the teletherapy unit; (2) an exposure of a teletherapy technician upon entering a high radiation area without personnel dosimetry, and (3) failure to have the required 5-year teletherapy maintenance performed. After consideration of the licensee's response, it was concluded that the first violation was not valid because of insufficient information. Therefore, the first violation was withdrawn and the associated civil penalty remitted. Since the proposed civil penalties for the remaining two violations were based on the first violation, the proposed civil penalties for these were also remitted. A revised Notice of Violation will be issued later, citing a violation relating to failure to follow emergency procedures.
2. Preliminary Notifications relating to the following actions were dispatched during the week:
  - a. PNO-I-81-67 Beaver Valley Power Station, Unit 2 - Construction Site Labor Disturbance
  - b. PNO-I-81-68 Peach Bottom Units 2 and 3 - Unplanned Noble Gas Releases
  - c. PNO-I-81-69 Millstone Nuclear Station, Unit 1 - Release of Radioactive Effluent to Unrestricted Area
  - d. PNO-I-81-70 Peach Bottom Units 2 and 3 - Update on Unplanned Noble Gas Releases, PNO-I-68
  - e. PNO-II-81-44 North Anna Unit No. 2 - Failure of Main Transformer
  - f. PNO-II-81-45 AMAX Specialty Metals Corporation - Apparent Zirconium Sponge Fire in Pit
  - g. PNO-II-81-46 Farley Unit No. 2 - Primary to Secondary Leak in "B" Steam Generator
  - h. PNO-III-81-56A Prairie Island, Unit 2 - Shutdown in Excess of 48 Hours - Inability to Manually Rotate Reactor Coolant Pump (Update of PNO-III-81-56)
  - i. PNO-III-81-57 D. C. Cook Unit 1 - Damaged Fuel Assembly

- j. PNO-III-81-57A D.C. Cook Unit 1 - Damaged Fuel Assembly - Update
- k. PNO-III-81-58 Point Beach Plant, Unit 1 - Sodium Hydroxide Addition System Valved Out
- l. PNO-III-81-60 Davis-Besse Site - Reactor Scram
- m. PNO-III-81-60A Davis-Besse Site - Reactor Scram (Update)
- n. PNO-IV-81-15 Arkansas Nuclear One, Unit 2 - Destruction of "B" Main Feedwater System Turbine and Damage to Other Systems And/or Components and Injury to a Contractor Employee
- o. PNO-TMI-81-12 Three Mile Island, Unit 2 - Postponement of Polar Crane Inspection During Reactor Building Entry
- p. PNS-I-81-15 Indian Point, Unit 3 - Indian Point Station Bomb Threat

OFFICE OF INSPECTION AND ENFORCEMENT

Items of Interest

Week Ending July 2, 1981

1. The following Notifications of Significant Enforcement Action were dispatched during the past week:
  - a. EN-79-16A Consumers Power Company (Palisades Nuclear Power Facility) - An Order Imposing Civil Penalties in the amount of \$450,000 was previously issued to subject licensee on December 20, 1979 (EN-79-16). This action was based on three alleged items of noncompliance which involved violation of containment integrity over a period of about 17 months. The licensee requested a hearing and an agreement was reached whereby Consumers Power Company agreed to pay civil penalties in the amount of \$225,000. The settlement notes dispute over the length of time containment integrity was not maintained but notes that containment integrity was violated in excess of one day when the plant was in other than cold shutdown.
  - b. EN-81-22 Pharmaco Nuclear, Inc., Cleveland, OH - A Notice of Violation and Proposed Imposition of a Civil Penalty in the amount of \$2,800 was issued on July 1, 1981 to subject licensee. This action was based on an alleged violation involving loss of attache cases containing radiopharmaceuticals during transport and delivery to several local hospitals. The licensee took immediate steps to correct the problem, and immediately notified the NRC. It was therefore determined that a 30 percent reduction in the civil penalty from \$4,000 to \$2,800 was appropriate.
2. Preliminary Notifications relating to the following actions were dispatched during the week:
  - a. PNO-I-81-71 Indian Point Unit 2 - Overflow of Resin Cask
  - b. PNO-I-81-72 UNC Recovery Systems, Wood River Junction, R.I. - Breach of Plywood LSA Radioactive Waste Shipping Box
  - c. PNO-II-81-47 Crystal River Unit No. 3 - Unplanned Outage
  - d. PNO-III-81-59 Palisades Nuclear Power Plant - Diesel Generator and Shutdown Sequencer Inoperability
  - e. PNO-III-81-61 Davis Besse - Extended Shutdown Due to Immovable Control Rod
  - f. PNO-V-81-35 San Onofre Nuclear Generating Station, Unit No. 1 - SONGS 1 Allegations During SONGS 2/3 ASLB Hearing
  - g. PNO-V-81-36 U.S. Ecology, Inc., Beatty, Nevada Burial Site - Banning of Public Service Electric and Gas Company, Newark, New Jersey (NRC Licensee) for Radioactive Waste Shipment

- h. PNO-V-81-37 U.S. Ecology, Inc., Beatty, Nevada Burial Site - Banning of United Nuclear Corporation, Wood River Junction, Rhode Island (NRC Licensee) for Radioactive Waste Shipment
- i. PNO-TMI-81-13 Three Mile Island, Unit 2 - Epicor-II Liner Shipment
- j. PNS-V-81-06 San Onofre Nuclear Generating Station - Bomb Threat





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

AEOD/E116

JUL 14 1981

This is an internal, pre-decisional document not necessarily representing a position of AEOD or NRC.

MEMORANDUM FOR: Carlyle Michelson, Director  
Office for Analysis and Evaluation  
of Operational Data *50-339*

FROM: Matthew Chiramal  
Office for Analysis and Evaluation of  
Operational Data

SUBJECT: TRIP REPORT TO NORTH ANNA-2 - FAILURE OF B PHASE  
MAIN TRANSFORMER AND SUBSEQUENT FIRE IN THE TRANSFORMER  
AREA

On July 9, 1981, I joined NRR staff members on a visit to North Anna-2 to view the extent of damage caused by the failure of B phase main transformer and subsequent fire. The failure of the transformer had occurred on July 3, 1981, while Unit 2 was at 17% power and Unit 1 was at full load (see enclosed memorandum from L. Engle to T. Novak for details of the event).

A fault in the transformer 500 KV bushing inside the transformer casing is suspected to be the cause of the failure (the manufacturer, Westinghouse, is investigating the failure). The short circuit in the transformer caused ruptures in the casing and the spilled oil (~9000 gallons) in the B phase transformer bay and the adjacent spare transformer bay caught on fire.

Observations

1. The 3 single phase transformers are located in a common bay separated from each other by concrete walls. The spare transformer bay is also part of the common bay. The spilled oil spread mainly in the B phase transformer bay and the spare transformer bay.
2. The B phase transformer suffered extensive damage. The casing was ruptured in several places and the shell was distorted. Most of the bushings, lightning arrestors, and auxiliaries were damaged.
3. The fire damage in the B phase transformer bay was not as severe as in the spare bay. This apparently is due to the fire protection sprinkler system actuation in the transformer bay.

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4. No damage was apparent in the A and C phase transformer sections (again apparently due to the sprinkler systems there).
5. Severe fire damage was seen in the spare transformer bay (which was empty at the time of the event). The spare transformer bay is not fitted with a fire protection system.
6. The fire in the spare bay caused severe damage to the turbine building wall and to overhead aluminium buses of the C Reserve Station Service Transformer (RSST-C). The cables associated with these buses, that were mounted on vertical cable trays on the turbine building wall, were also burnt. (RSST-C provides part of offsite power from the 34.5 KV switchyard to the onsite distribution system - see enclosed single line diagram).

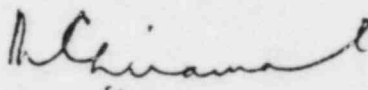
#### Conclusions

1. Transformer casings apparently are not designed to withstand severe electrical short circuits inside the transformer. Such short circuits can split the transformer casing and cause spillage of transformer fluid in the vicinity of the unit.
2. Fire protection deluge systems can effectively reduce damages due to oil fires.
3. At North Anna 1 and 2, the three reserve station transformers (RSST-A, B, and C) are located adjacent to each other away from the main and station service transformers. However, these transformers are not protected by deluge systems. An oil fire in the area could conceivably damage all three transformers and thus affect offsite power availability to both North Anna units.
4. Several operating nuclear plants have liquid filled transformers located inside the plant building (load center transformers for safety-related and nonsafety-related buses). These plants are not designed to contain or protect against ruptures of these transformers and consequent spillage and fires.
5. In view of the number of transformer failures at operating reactors, we should review the surveillance and preventive maintenance programs being practiced by the utilities to see how failures can be reduced and thus reduce challenges to the onsite power distribution systems.

Carlyle Michelson

- 3 -

6. In implementing GDC 17 requirements regarding physical and electrical separation of the preferred power source connections to the plant onsite distribution system, effects of transformer oil fires should be considered.



Matthew Chiramal  
Office for Analysis and Evaluation  
of Operational Data

Enclosures:  
As Stated

cc w/enclosures:  
TNovak  
RMattson  
GLainas  
EJordan  
LEngle  
VBenaroya  
RFerguson  
JOlshinski



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JUL 06 1981

MEMORANDUM FOR: Thomas M. Novak, Assistant Director for  
Operating Reactors, DL

THRU: Robert A. Clark, Chief *Robert A. Clark*  
Operating Reactors Branch #3, DL

FROM: Leon B. Engle, Project Manager  
Operating Reactors Branch #3, DL

SUBJECT: UPDATE ON TRANSFORMER FIRE AT NORTH ANNA POWER STATION,  
JULY 3, 1981

At 7:22 AM, Friday (July 3, 1981) a fire in the main-phase B transformer which was carrying power from Unit No. 2 initiated an automatic shutdown of Unit 2.

The cause of the fire was an electrical fault in the B transformer. The fire ruptured the transformer and spread to cooling oil (~69,000 gal. rated capacity) which spilled through the rupture. Heat from the oil-fire caused nitrogen bottles serving the transformer to explode.

The loss of load (B transformer) initiated a turbine-reactor trip, at approximately 7:22 AM for Unit 2. As a precautionary measure, plant operators tripped two Reactor Coolant Pumps (Unit-2) to reduce hotel-load on Unit 2.

At about 7:40 AM, the fire melted open bus bars that receive power from the reserve C transformer. These open bus bars were physically located over B transformer in their connection from C transformer to the turbine building. These bus bars supply emergency power to both Units and the melting of the bus bars caused reserve transformer C to relay out and the initiation of diesel generator power.

Because of the already occurred reactor trip at Unit 2 and cutoff of the two reactor coolant pumps, a low-low TAV signal was locked in on the ESFAS. At the time reserve C transformer relayed out, a spurious high steam flow signal registered on the ESFAS logic which when combined with the already present low-low TAV signal initiated Safety Injection. Safety Injection was terminated within 2 minutes by operator action.

Prior to initiation of these events, Unit No. 2 was at about 8% power and Unit No. 1 at 100% power. Unit No. 1 was reduced to 30% power as a precautionary measure and placed in a 72-hour Limiting-Condition-Of-Operation regarding two independent off site power sources. Unit No. 1 was later (about 3:00 PM) removed from the LCO and began increasing power for 100%.

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Because this fire held the potential for degradation of station safety levels, the station emergency director declared a station alert in accordance with VEPCO's Corporate Emergency Response Plan. State and Federal agencies were notified by the station emergency director in accordance with the Emergency Response Plan. VEPCO's emergency response managers monitored the alert from VEPCO's emergency response center in the Richmond headquarters.

The fire was extinguished at about 8:25 AM and the station alert was terminated at about 9:20 AM. The fire was contained on-site by the station fire brigade and was extinguished with the help of fire crews from Louisa County, Spotsylvania County and the town of Mineral.

The event occurred at a fortunate time since the day shift was just arriving to relieve the mid-shift still at stations. The Station Superintendent and Assistant Superintendent were both on site during the event.

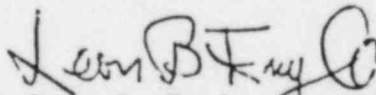
Two NRC inspectors from Surry and another two I&E inspectors (Region 2) arrived on site about noon and 3:00 PM, respectively.

Citizen concern was caused to a great extent by the copious, black smoke rising over the plant site. Numerous calls were received by VEPCO indicating concern.

It is presently estimated Unit No. 2 will be shutdown for three weeks until a spare-modified transformer arrives from the Surry Station.

I&E (Reg. 2) is presently preparing a Preliminary Notification of these events.

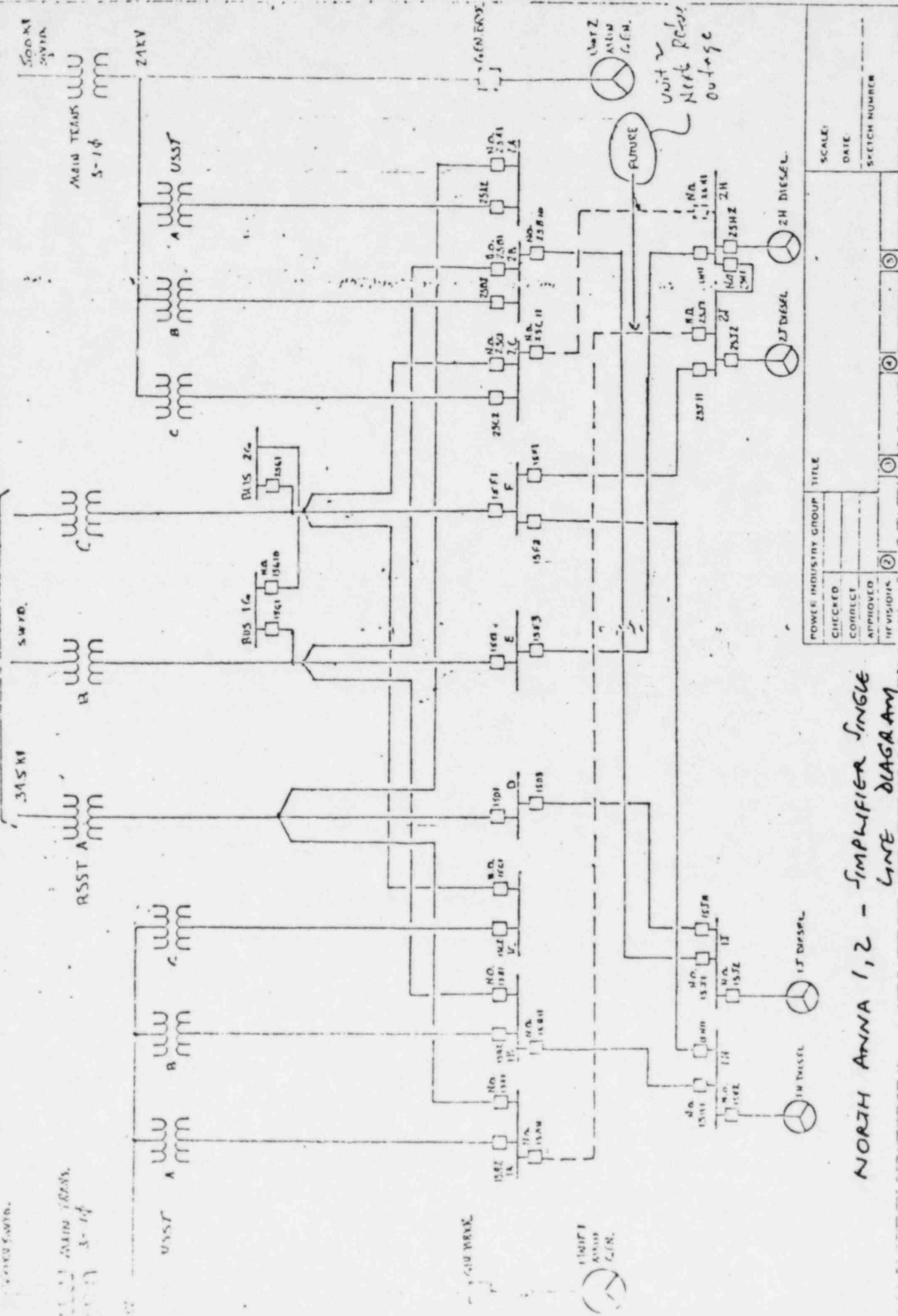
Note: The description of this event as described above may change as further information is received.



Leon B. Engle, Project Manager  
Operating Reactors Branch #3, DL

cc: H. Denton  
J. Carter  
D. Eisenhut  
R. Purple  
G. Lainas  
R. Tedesco  
S. Hanauer  
R. Vollmer  
R. Mattson  
T. Murley  
J. Sniezek  
J. Olshinski  
E. Case  
R. Clark

STOHL & WISBIR ENGINEERING CORPORATION



SCALE: \_\_\_\_\_  
DATE: \_\_\_\_\_  
SKETCH NUMBER: \_\_\_\_\_

NORTH ANNA 1, 2 - SIMPLIFIER SINGLE LINE DIAGRAM