Wisconsin Electric POWER COMPANY
231 W. MICHIGAN, P.O. BOX 2046, MILWAUKEE, WI 53201

January 3, 1985

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Attention: Mr. J. R. Miller, Chief
Operating Reactors, Branch 3

Gentlemen:

DOCKET NOS. 50-266 AND 50-301
APPENDIX R EXEMPTION REQUESTS
POINT BEACH NUCLEAR PLANT UNITS 1 AND 2

On June 30, 1982, Wisconsin Electric Power Company requested the following exemption for the 4160V switchgear room at the Point Beach Nuclear Plant:

> "Per the provisions of 10 CFR 50.48 (c)(6) and 10 CFR 50.12, Wisconsin Electric Power Company requests exemption from the specific requirements of Appendix R, Section III.G.2, i.e., from the requirements for separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet and from the requirements for enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1- hour rating."

Fire protection features for the 4160V switchgear room were discussed at a March 22, 1983 meeting with the Staff in Bethesda and in telephone conversations with Staff management on March 25 and March 31, 1983. As a result of agreements reached in these discussions, we proposed to implement fire protection modifications in addition to those presented in the March 1983 meeting. These additional modifications were submitted by our April 28, 1983 letter. The total scope of fire protection measures which was agreed to for the switchgear room as a result of the March 1983 meeting and subsequent discussions consisted of the following items:

A006
1/1

1. Existing separation of alternate 4160V switchgear which could be used to accomplish safe shutdown.

2. Limited fire damage could be assumed such that one half of the switchgear room is available for safe shutdown.

3. Provision of a single failure proof Halon automatic fire suppression system.

4. Provision of diverse means of fire detection and automatic Halon suppression system initiation by either cross zoned photoelectric smoke detectors or rate compensated heat actuated detectors.

5. Provision of an independent Halon automatic fire suppression system for each unit to discharge into each individual safeguards switchgear cabinet actuated by a photoelectric smoke detector in each cabinet.

6. Provision of conduit wraps to protect incoming power cables from the diesel generators.

7. Provision of flame impingement barriers beneath cable trays which could be exposed to a floor based exposure fire.

These agreements were also documented in our Final Report, Response to 10 CFR 50 Appendix R Alternate Shutdown Capability which was submitted to you in October 1983.

In a series of telephone discussions between the Staff and the licensee from May through September, 1984, the Staff indicated that the previously agreed-upon fire protection measures for the switchgear room were considered to be inadequate. The Staff suggested several additions and alternatives for our consideration and requested our evaluation of additional questions. In response to those suggestions and questions, we performed additional evaluations and proposed changes to the agreed-upon modifications. At the request of the Staff, a meeting was held on December 13, 1984 at Point Beach Nuclear Plant to discuss our proposed switchgear room fire protection measures, inspect the switchgear room, and to respond to further Staff questions.

During the December meeting the following fire protection measures for the switchgear room were proposed:

1. Existing separation of alternate 4160V switchgear which can be used to accomplish safe shutdown.

2. Limited fire damage could be assumed such that one half of the switchgear room is available for safe shutdown.

3. Provision of a single failure proof Halon automatic fire suppression system.

4. Provision of diverse means of fire detection and automatic Halon suppression system initiation by either cross zoned photoelectric smoke detectors or rate compensated heat actuated detectors.

5. Provision of an independent Halon automatic fire suppression system for each unit to discharge into each individual safeguards switchgear cabinet actuated by a photoelectric smoke detector in each cabinet.

6. Provision of wrapping for conduit within the room which contains one division of incoming safeguards power cable from one diesel generator.

7. Provision of wrapping for conduit within the room which contains one division of outgoing safeguards power cable necessary to power required safe shutdown equipment.

8. Provision of cable tray wrapping and pullbox enclosure of power cables for two service water pumps which are necessary to achieve safe shutdown.

9. Provision of wrapping of cable trays which contain incoming and outgoing non-safeguards power cables for one alternate set of switchgear which can be used to accomplish safe shutdown.

A copy of viewgraphs used in the presentation is enclosed for your information. Minor errors in certain of the viewgraphs have been corrected.

It is appropriate to review the requirements to Appendix R and the way in which Wisconsin Electric has specifically chosen to meet those requirements for a fire in the Electrical Switchgear Room, as follows:

Rule Requirements	WEPCO Compliance
One automatic detection system	One cross zoned photo-electric detection system and One rate-compensated heat detection system (any one of eight)
One automatic fixed suppression system	Two fully redundant automatic fixed suppression systems (using Halon 1301)

One-hour fire wraps or physical separation free of intervening combustibles	For cables, one-hour wraps on two divisions. For mechanical switchgear sections, 20 feet of physical separation with all intervening fixed combustibles within line of sight enclosed in the switchgear sections.

The table above clearly indicates that we have proposed modifications beyond the requirements of Appendix R.

Our presentation began with an explanation to the Staff that the electrical switchgear room has eight separate, fully capable switchgear section combinations which can power all necessary AC equipment required to achieve hot and cold safe shutdown. The greatest separation distance between switchgear sections is approximately 39 feet. The only line of sight intervening physical items are other enclosed switchgear sections containing negligible quantities of combustibles. Of these eight potential fully capable safe shutdown power sources, we proposed to protect the essential cabling associated with two sources. The regulation only requires that the cabling and associated switchgear segments of one 4160V power source need be protected.

Hence, we have provided not one but two detection systems, not one but two fully automatic full-room suppression systems, and not one but two safe shutdown power sources.

Subsequent to the discussion of fire protection measures, a tour of the switchgear room was conducted. During this tour, we provided a detailed description and discussion of the actions to be taken by an operator manually operating the 4160V switchgear. This discussion reached the conclusion that the operation of the switchgear can be easily accomplished in a timely fashion. We explained to the Staff that the switchgear could be both opened and reclosed without requiring recharging of the springs. The presentation in the switchgear room clearly indicated the levers and mechanism necessary to both open and close a breaker. We believe that the logic and consistency of our position with regard to taking limited post-fire manual actions in the switchgear room on the 4160V switchgear breakers was adequately demonstrated during the tour.

Following the tour of the switchgear room the meeting was reconvened in order to discuss specific Staff questions which had been provided by Mr. T. Colburn of your Staff prior to the meeting. These questions and our responses were as follows:

1. Discuss inadvertant operation of the Halon system on switchgear. Will it cause switchgear to trip?

Discharge of the Halon systems installed for protection of the switchgear will not cause switchgear to trip. Halon fire suppression systems are routinely installed to protect sensitive computer and other electronic equipment from fire damage and would not be expected to have any impact on the operation of the relatively massive and insensitive 4160 volt switchgear. In addition, we also noted that the Halon system installed for protection of the switchgear room was tested successfully using Freon gas during system acceptance tests. There were no effects on the switchgear as a result of these tests.

2. Discuss the relationship of cables in the switchgear room to operation of the switchgear.

Our response to this question noted that only power cables to and from selected switchgear are necessary for safe shutdown in the event of fire in the switchgear room. These cables are proposed to be protected by wrapping, as discussed in the presentation of proposed modifications. Control cables are not necessary for safe shutdown since manual operation of the switchgear is assumed. Accordingly, no protection is provided for these cables.

In subsequent questions related to this subject, the Staff postulated a fire in the switchgear room such that main distribution panels and battery chargers would be destroyed with subsequent loss of DC power to the switchgear. We noted that this would not prevent safe shutdown since the loss of DC power does not prevent manual operation of the switchgear.

The Staff also postulated a fire which results in a short in unprotected DC power cables in the switchgear room. DC power would then be maintained to switchgear intended to be operated manually, even though DC power circuit beakers in the cable spreading room had been opened as part of the safe shutdown operator actions. Since the DC power is ungrounded at Point Beach, this would require the simultaneous shorting of four conductors in such a way that power is maintained with no short to ground. We note that, in SECY-83-269 issued in July 1983, the Staff states that such a condition is judged to be unlikely. However, even if this were to occur, the operator in the switchgear room can interrupt DC control power to each switchgear section by opening a knifeswitch in the appropriate bus tie auxiliary cabinets. Control power cables to individual breakers from the auxiliary cabinet are internal to the switchgear cabinets and damage to these cables which causes a four conductor short is even more unlikely.

Subsequent to our meeting, we reviewed further the control power cable routing to the switchgear. The normal control power for safeguards buses 1A05 and 1A06 is routed in an individual conduit from a common breaker in the cable spreading room to the knifeswitch in the bus tie auxiliary cabinet. Normal control power for buses 2A05 and 2A06 is also routed in individual conduit to the bus tie auxiliary cabinet. Alternate DC power for these sets of buses is routed in the same manner in conduits separate from the normal control power conduits. Thus, for safeguards switchgear, there is no potential for short circuits to maintain control power in the event of a fire. Normal and alternate control power for non-safeguards switchgear is routed in a common tray. However, as noted above, this power can be interrupted by opening a knifeswitch in the appropriate bus tie auxiliary cabinet.

We therefore conclude that a fire in the switchgear room which causes a loss of, or spurious presence of, DC control power to the switchgear will not prevent safe shutdown of the plant.

3. Describe actions that must be performed in the switchgear room after a fire. Indicate time sequence.

Our October 1983 submittal described actions to be performed and provided detailed time sequences for operator actions in the event of a fire requiring safe shutdown outside the Control Room which, from the standpoint of required operator actions, is the worst-case occurrence.

Operator actions in the event of a fire in the switchgear room would follow fire extinguishment and the time sequence would be similar to those described in our October 1983 submittal for the Control Room fire.

4. Discuss the prevention of damage to the switchgear if water is needed to back up Halon Suppression.

In response to this question, we emphasized that the redundant Halon system can be expected to extinguish a fire in the switchgear room without requiring a water backup. In addition to this system, we noted that an independent Halon system is proposed for individual safety related switchgear cabinets which provides protection for switchgear components in the event of a fire internal to the cabinet. However, we also noted during our discussions and the switchgear room tour that carbon dioxide and dry chemical extinguishers are available inside and outside the switchgear room and could be used in the unlikely event that backup to the Halon suppression system

is required. In addition to these extinguishers, fire hoses with fog nozzles are available and could be used if other means of extinguishment were unsuccessful. We pointed out that Point Beach Fire Brigade members have received training in the use of water to fight fires in and around electrical equipment and expressed our belief that, even if water mists were to enter the cabinets, no adverse effects on switchgear operation would be expected.

5. Discuss the potential for damage to all switchgear by combustion products transported during Halon suppression.

The Halon system installed for suppression of postulated fires in the switchgear room was tested successfully prior to acceptance using Freon gas. Room concentrations after discharge reached levels in excess of requirements. Design flow rates for the Halon system are in the order of 6000 cfm of gas for a period of approximately 15 seconds after initiation. We noted that this flow rate is less than twice the normal room ventilation rate and would not be expected to transport significant quantities of combustion products to the switchgear cabinets. Since the switchgear cabinets are not ventilated except by natural convection, it is not expected that significant quantities of combustion products would enter the cabinets even if they were present in the area. However, if smoke particles should enter the cabinets it is likely that the photoelectric detectors provided inside the cabinets with the proposed independent Halon system would initiate discharge of the system. The effect of this discharge would be to reduce the concentration of combustion products inside the cabinet and, thus, minimize any potential for adverse effects. Finally, we pointed out the extensive insulation provided for internal switchgear components which, in itself, provides substantial protection against effects of contamination due to smoke particles or other combustion products.

Thus, we concluded that the potential for damage to switchgear by transport of combustion products due to Halon system actuation was minimal and of no consequence.

6. Discuss the feasibility of providing an alternate shutdown capability around the switchgear room.

The provision of alternate shutdown capability such that portions of equipment in the switchgear room are not needed for safe shutdown has been considered. Such provisions would include an intermediate bus section with supply and output breakers powered from the gas turbine. This bus section would then be used to supply station service transformer 1-X11 through a transformer input breaker. Transformer 1-X11 supplies power to the 480V non-safeguards bus 1-B01. Safeguards

bus 1-BO3 could then be energized through a bus crosstie between buses 1-BO1 and 1-BO3 to provide power to the required safe shutdown equipment without use of equipment in the switchgear room. This modification would require, in addition to the intermediate bus section, breakers, and associated controls, the purchase and routing of large quantities of 5 Kv power cables from the gas turbine to the intermediate bus section and transformer 1-X11. It was estimated that equipment costs alone would be in the order of $500,000, excluding engineering and installation costs. When compared to the estimated installed cost of $90,000 to $120,000 for the proposed modifications which provide an equivalent level of protection, this alternative was rejected as economically unfeasible.

During our meeting, the Staff also postulated two further fire scenarios in the switchgear room. For either of these scenarios to occur the failure of the redundant Halon system to provide adequate suppression, the failure of the redundant and diverse fire detection system to provide indication of a fire, the failure of manual firefighting efforts, and loss of offsite power must be assumed. We emphasized during our responses that we considered the postulated scenarios to be far beyond those considered credible, in view of modifications already completed, further proposed modifications, and agreements reached with the Staff during our March 1983 technical presentation and appeal meetings.

The first of these scenarios assumed that all cables above the switchgear cabinets were destroyed, except for cables which have been protected in accordance with our proposed modifications, and that switchgear remains undamaged. In response to this scenario, we noted that the required safe shutdown equipment would be available, given no loss of function of the switchgear and integrity of the protected cables.

The second of these scenarios postulated the loss of all switchgear located in the room with cables above the switchgear remaining intact. This, of course, would require some means of providing power to safe shutdown equipment from a point outside the switchgear room. We described, in general, two possible actions in the event of such an occurrence. The first could be to provide spare cables and termination points to route power around the switchgear room to the cable spreading room in order to provide power to required safe shutdown equipment through existing switchgear. The second, evaluated preliminarily during a past emergency plan exercise, would be to backfeed power from the gas turbine through the Unit 1 main power transformer to Bus 1-AO1, Bus 1-BO1, and Bus 1-BO3 to power required safe shutdown equipment. This would require disconnecting or cutting main generator leads and the bus tie between buses 1-AO1 and 1-AO3.

We believe that modifications proposed in our March 1983 meeting provided adequate levels of protection and ensured that safe shutdown of both units in the event of a switchgear room fire could be accomplished. However, we committed to additional levels of protection in response to Staff requests during that meeting. Further, we have revised our proposed modifications in response to Staff suggestions subsequent to that meeting. We are concerned that the Staff continues to postulate fire scenarios in the switchgear room which extend beyond those which can be considered credible and, indeed, are beyond those previously agreed to as bounding conditions for which we have proposed modifications. We have in good faith responded to continuing Staff requests for further information, even to the extent of providing responses to incredible events. We, therefore, request that you provide final resolution of this issue through approval of our proposed modifications as discussed in this submittal. Further, following your approval, we also request a meeting with you as soon as practicable to discuss a schedule for completion of our proposed modifications such that our mutual objectives can be met.

Very truly yours,

C. W. Fay

Vice President - Nuclear Power

C. W. Fay

Enclosure

Copy to NRC Resident Inspector

THIS MORNING'S PRESENTATION

- FOCUSES ON SWITCHGEAR ROOM
- REVIEWS PREVIOUS BASES FOR CONCURRENCE
- OUTLINES SUBSEQUENT DISCUSSIONS WITH CHMEB STAFF
- PRESENTS REVISED DESIGN MORE CLOSELY CONFORMING TO REGULATION AND CHMEB STAFF PERSPECTIVES

FIRE PROTECTION CONCEPT

- TOLERATES SUBSTANTIAL FIRE IN SWITCHGEAR ROOM AND STILL MAINTAIN SAFE SHUTDOWN CAPABILITY

PREVIOUS BASIS FOR NRC CONCURRENCE
MARCH 1983 MEETING

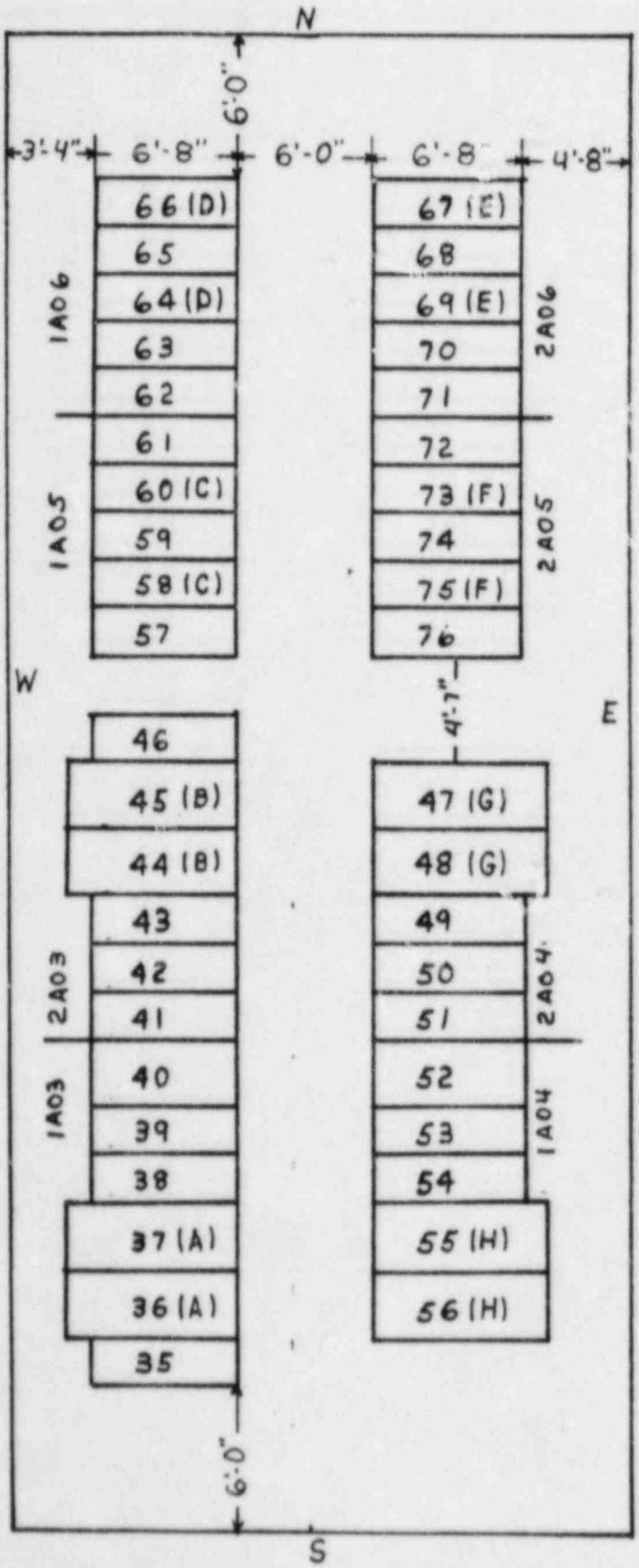
- EXISTING SEPARATION
- LIMITED DAMAGE TO ROOM ASSUMED
- SINGLE FAILURE PROOF GRADE SUPPRESSION (HALON) SYSTEM
- DIVERSE MEANS OF DETECTION
- IMPLEMENTATION OF INDEPENDENT SWITCHGEAR DETECTION AND SUPPRESSION SYSTEM
- PLUME IMPINGEMENT SHIELDS

SEPARATION

- SAFETY RELATED 4160 VAC SGR AT NORTH END
- NON-SAFETY RELATED 4160 VAC SGR AT SOUTH END
- EITHER CAN PROVIDE POWER TO REQUIRED 480 VAC SWITCHGEAR
- FIRE EFFECTS ON ONE HALF SWITCHGEAR ROOM WOULD NOT PRECLUDE SAFE SHUTDOWN
- EXISTING HORIZONTAL SEPARATION MEETS SECTION III.G.2.B

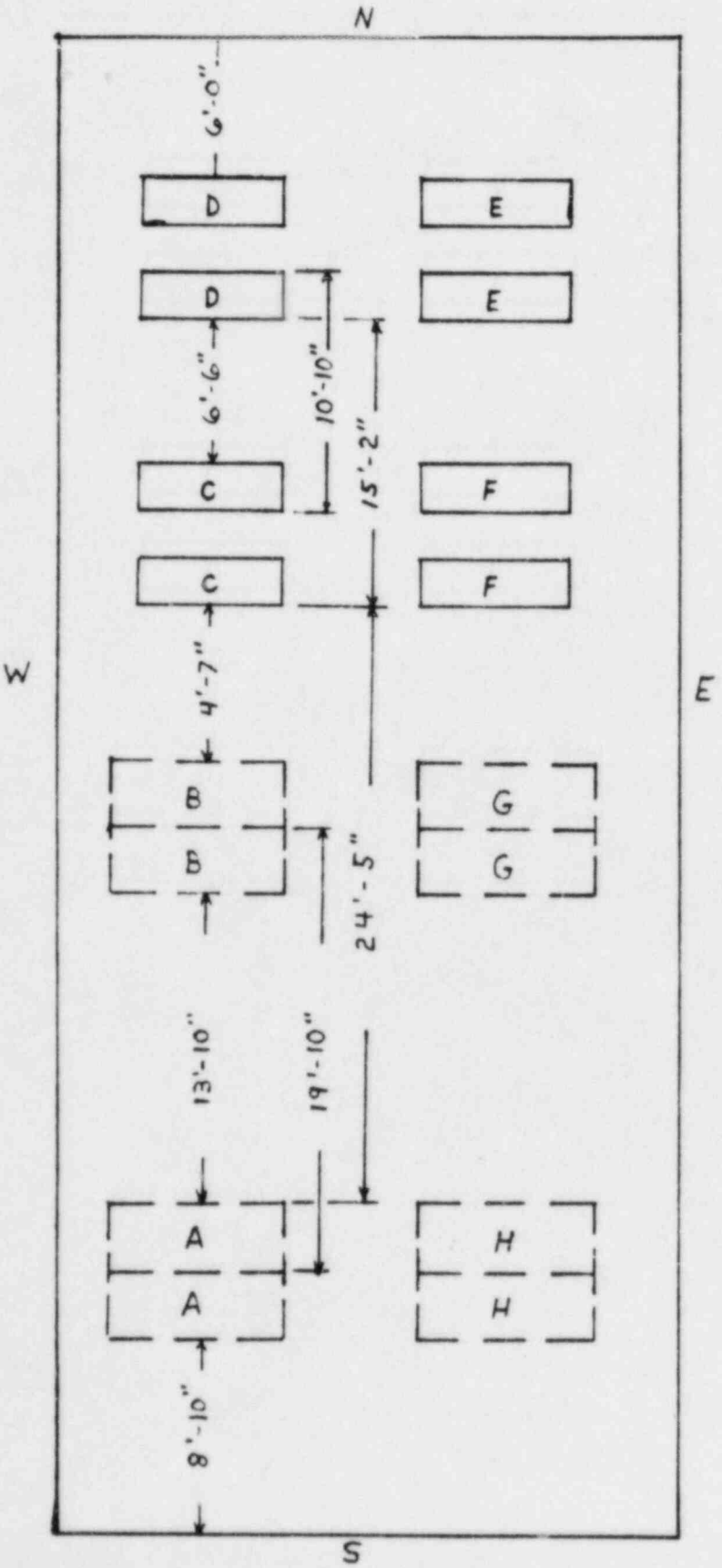
4160 VAC SWITCHGEAR ROOM

CABINET LOCATIONS



CABINET	SERVICE
35	AUXILIARY COMPARTMENT
36 (A)	1X04 - 1A03 POWER SUPPLY
37 (A)	1A03 - 1A01 BUS TIE
38	1A03 - 1A05 BUS TIE DUMMY BRKR.
39	SPARE
40	1A03 - 2A03 BUS TIE BRKR
41	1A03 - 2A03 BUS TIE AUXILIARY
42	SPARE
43	2A03 - 2A05 BUS TIE DUMMY BRKR
44 (B)	2A03 - 2A01 BUS TIE
45 (B)	2X04 - 2A03 POWER SUPPLY
46	AUXILIARY COMPARTMENT
47 (G)	2X04 - 2A04 POWER SUPPLY
48 (G)	2A04 - 2A02 BUS TIE
49	2A04 - 2A06 BUS TIE DUMMY BRKR
50	SPARE
51	1A04 - 2A04 BUS TIE AUXILIARY
52	1A04 - 2A04 BUS TIE BRKR
53	SPARE
54	1A04 - 1A06 BUS TIE DUMMY BRKR
55 (H)	1A04 - 1A02 BUS TIE
56 (H)	1X04 - 1A04 POWER SUPPLY
57	1A05 - 1A03 BUS TIE BRKR
58 (C)	1A05 - 1B03 POWER SUPPLY
59	1A05 - "1A" SAFETY INJ. PUMP
60 (C)	DIESEL GEN 1 - 1A05 POWER SUPPLY
61	1A05 - 1A06 BUS TIE BRKR
62	1A05 - 1A06 BUS TIE AUXILIARY
63	1A06 - 1A04 BUS TIE BRKR
64 (D)	1A06 - 1B04 POWER SUPPLY
65	1A06 - "1B" SAFETY INJ. PUMP
66 (D)	DIESEL GEN 2 - 1A06 POWER SUPPLY
67 (E)	DIESEL GEN 2 - 2A06 POWER SUPPLY
68	2A06 - "2B" SAFETY INJ. PUMP
69 (E)	2A06 - 2B04 POWER SUPPLY
70	2A06 - 2A04 BUS TIE BRKR
71	2A05 - 2A06 BUS TIE AUXILIARY
72	2A05 - 2A06 BUS TIE BRKR
73 (F)	DIESEL GEN. 1 - 2A05 POWER SUPPLY
74	2A05 - "2A" SAFETY INJ. PUMP
75 (F)	2A05 - 2B03 POWER SUPPLY
76	2A05 - 2A03 BUS TIE BRKR.

4160V SWITCHGEAR ROOM
SAFE SHUTDOWN CABINET
LOCATION



SWITCHGEAR ROOM

HALON SUPPRESSION SYSTEM DESIGN

- REDUNDANT ROOM SUPPRESSION SYSTEMS
- FOUR OUT OF FIVE DESIGN (ONE SPARE BOTTLE PER SYSTEM)
- SYSTEM SUBSTANTIALLY OVERDESIGNED
  - CONCENTRATION EXCEEDS NFPA REQUIREMENTS
  - TEST RESULTS INDICATE 8 - 9%

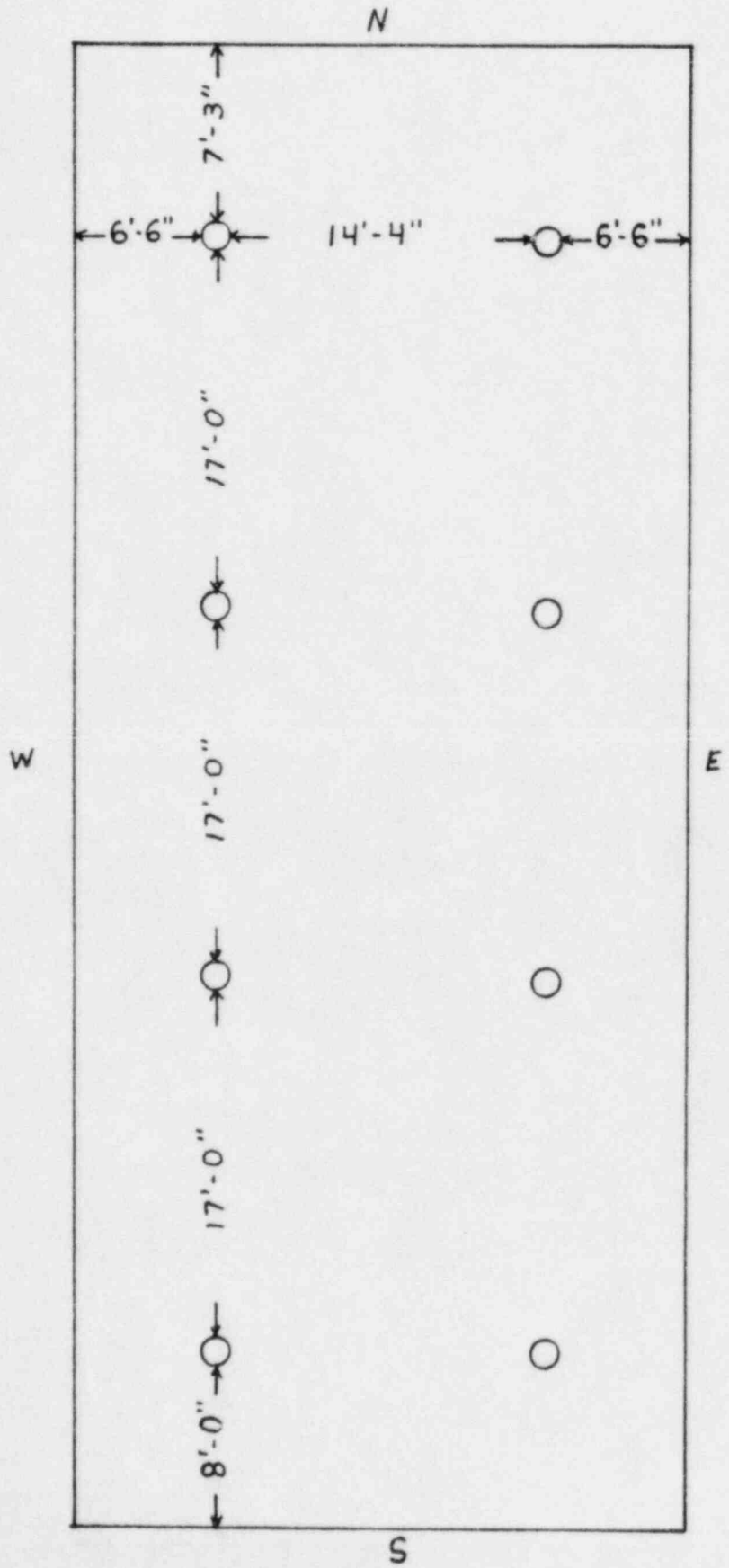
DETECTION SYSTEM DESIGN

- o CONFORMS TO NFPA 72D & 72E
- o REDUNDANT AND DIVERSE ACTUATION
- o DETECTOR PLACEMENT BASIS IN EXCESS OF NFPA 72E
- o SMOKE DETECTOR PLACEMENT ACCEPTANCE BY BROOKHAVEN NATIONAL LABORATORIES
  - INDEPTH REVIEW BY DR. BOCCIO OF BNL
  - MARCH 3, 1980 & MARCH 30, 1980
- o HEAT DETECTOR SPACING CLOSER THAN REQUIRED BY FACTORY MUTUAL APPROVAL GUIDE

". . . . WE CONSIDER THE APPROACH ADOPTED BY WISCONSIN ELECTRIC POWER COMPANY IN THEIR REPORT "FIRE DETECTION SYSTEM SELECTION CRITERIA" TRANSMITTED TO NRC BY LETTER DATED DECEMBER 20, 1979 TO BE THE MOST SUITABLE. WE HAVE FOUND THE APPROACH ADEQUATE SINCE IT CONTAINS A VIABLE MIX OF SOUND ENGINEERING JUDGEMENT, PRESENT DAY STATE-OF-THE-ART SMOKE DETECTOR SITING TECHNOLOGY, AND THE USE OF VISUAL SMOKE FOR SITING ASSESSMENT. ALL OF THE FACTORS LISTED ABOVE ARE EITHER CONSIDERED DIRECTLY OR THEIR CONSIDERATION IS INFERRED. THIS INDICATES TO US THAT WELL INFORMED INDIVIDUALS, COGNIZANT OF THE PROBLEMS ASSOCIATED WITH DETECTOR SITING TECHNOLOGY, HAVE PREPARED THE NOTED DOCUMENT. ALSO, THEIR FIRE DETECTOR LOCATION PLAN AND THE PROCEDURES USED FOR GENERATING SUCH A PLAN, SHOULD BE INSTITUTED BY OTHER UTILITIES THAT ARE CONTEMPLATING A FIRE DETECTOR ANALYSIS."

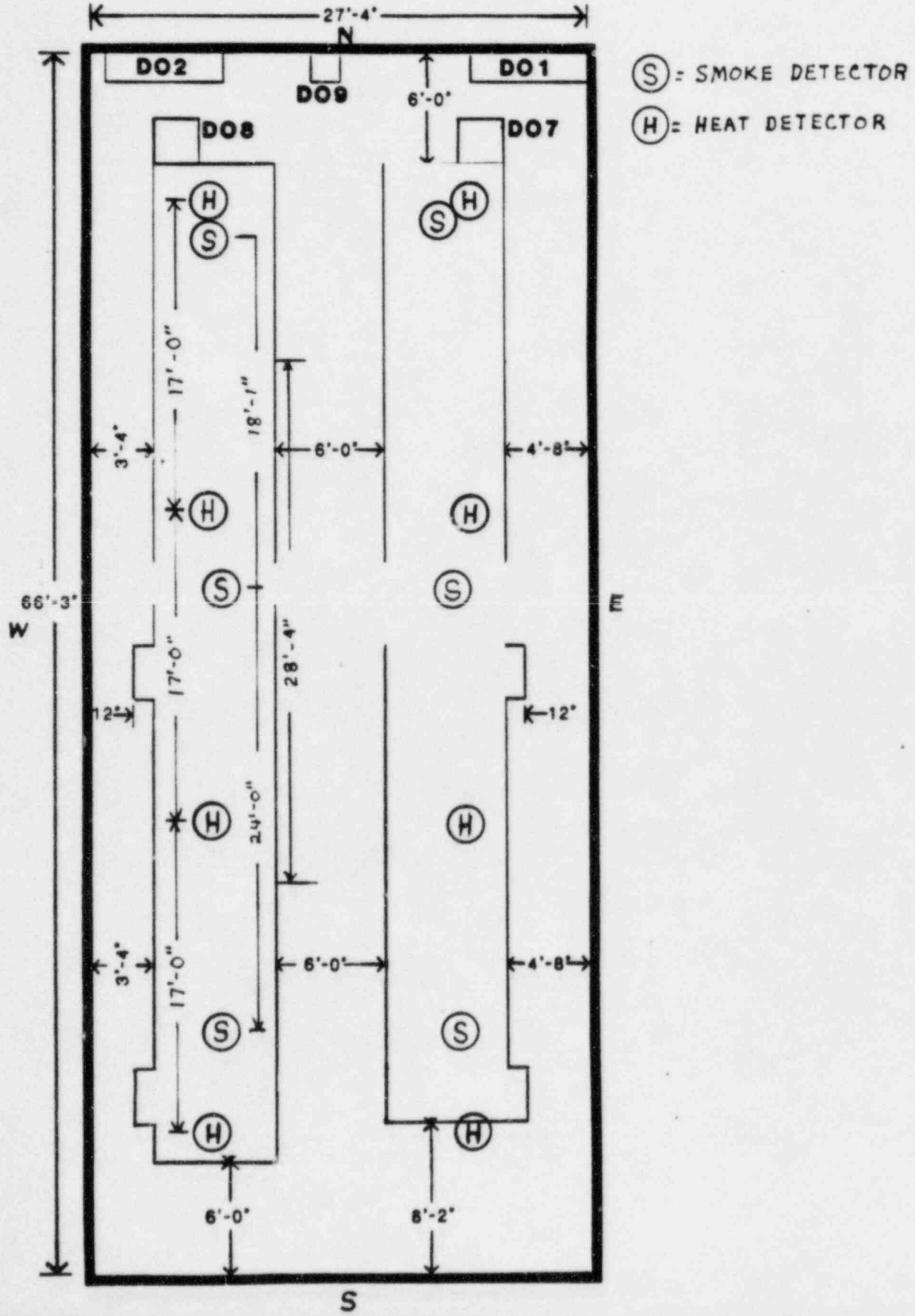
J. BOCCIO TO R. L. FERGUSON
MARCH 23, 1980

4160V SWITCHGEAR ROOM
HEAT DETECTOR LOCATION



SMOKE AND HEAT DETECTOR LOCATION

SWITCHGEAR ROOM



SPECIAL SWITCHGEAR SUPPRESSION AND DETECTION SYSTEMS

- TWO INDEPENDENT HALON SUPPRESSION SYSTEMS
  - One System For Each Unit's Safety Related Switchgear
- IN ADDITION TO EXISTING, REDUNDANT ROOM SYSTEMS
- INDEPENDENT DETECTION SYSTEM
- PROVIDED FOR EACH SAFETY RELATED SWITCHGEAR CUBICLE
  - Halon Nozzle
  - Photoelectric Detector

PLUME IMPINGEMENT SHIELDS

- o PROTECTION OF EXPOSED TRAYS
  - From Floor Based (Aisle) Fires
  - Effective, Practical Reduction of Combustibles
- o SELECTED LOCATIONS
  - Low Trays
  - Over Aisles

WEPCO/STAFF
SUBSEQUENT DISCUSSIONS

- IMPLIED CONCERNS RE PREVIOUS CONCURRENCE
- SUGGESTION OF ADDITIONAL ALTERNATES
- INDICATION OF POTENTIAL REVISED ACCEPTANCE BASIS
  - III.G.2.B FOR SEPARATION OF SWITCHGEAR CABINETS
  - III.G.2.C FOR REQUIRED CABLES
- WEPCO STUDIES
  - DETAILED AMPACITY STUDIES
  - REVIEWED EFFECTS OF AND THE FEASIBILITY OF WRAPS

CONFORMANCE METHODS

- o COMBINATION OF III.G.2.B & C TECHNIQUES
  - SEPARATION > 20 FT.
  - WRAPS ON TRAYS & CONDUIT
- o DIVERSE MEANS OF
  - DETECTION
- o SINGLE FAILURE CRITERIA APPLICABLE TO:
  - SUPPRESSION

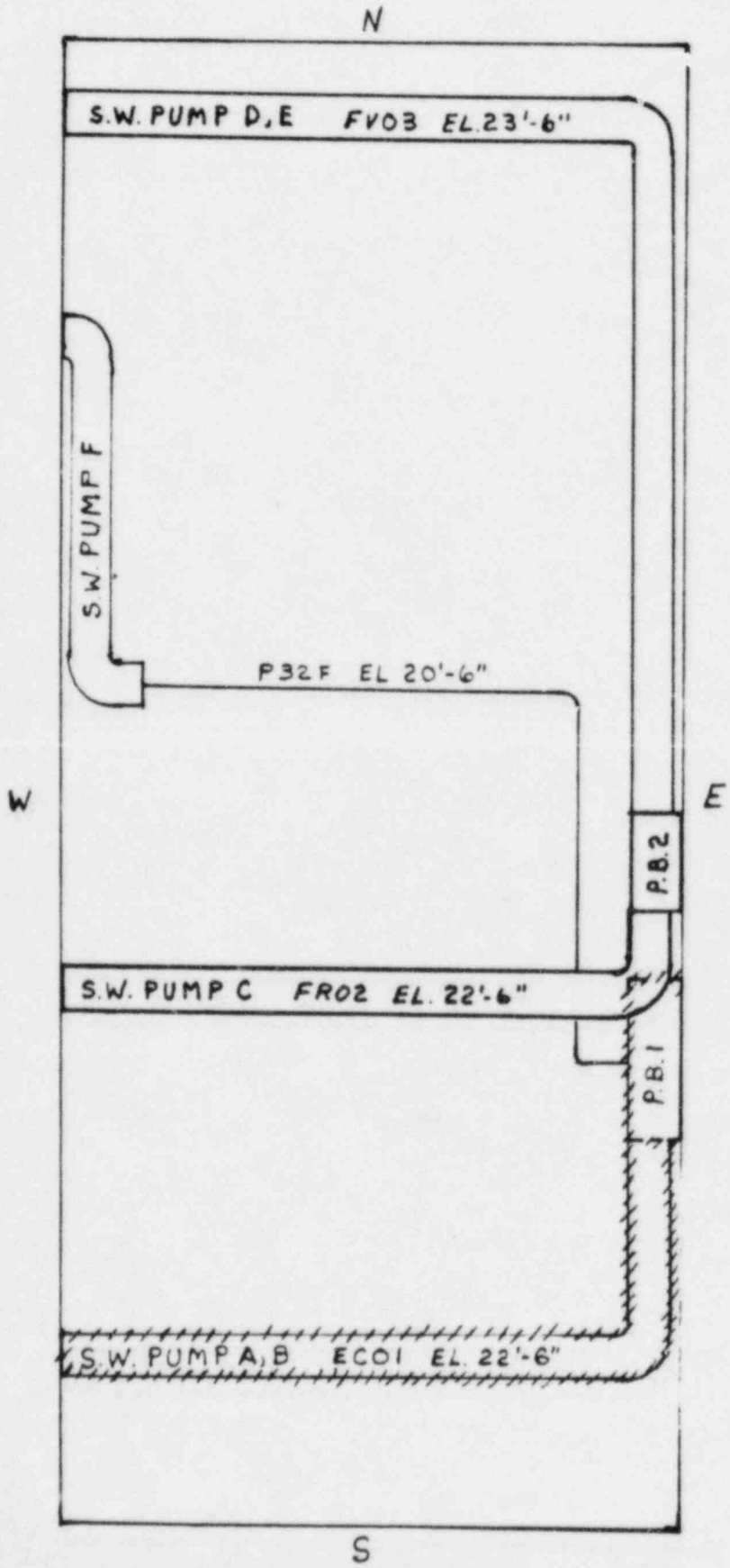
SWITCHGEAR ROOM WRAPS

- o EXCEEDS INTENT OF RULE
- o WRAPS ON
  - 1 DIVISION OF NECESSARY SAFE SHUTDOWN POWER FEEDS
    - 1 DG POWER FEED
    - 1 FEED TO 480 VAC
    - 1 TRAY TO SERVICE WATER PUMPS

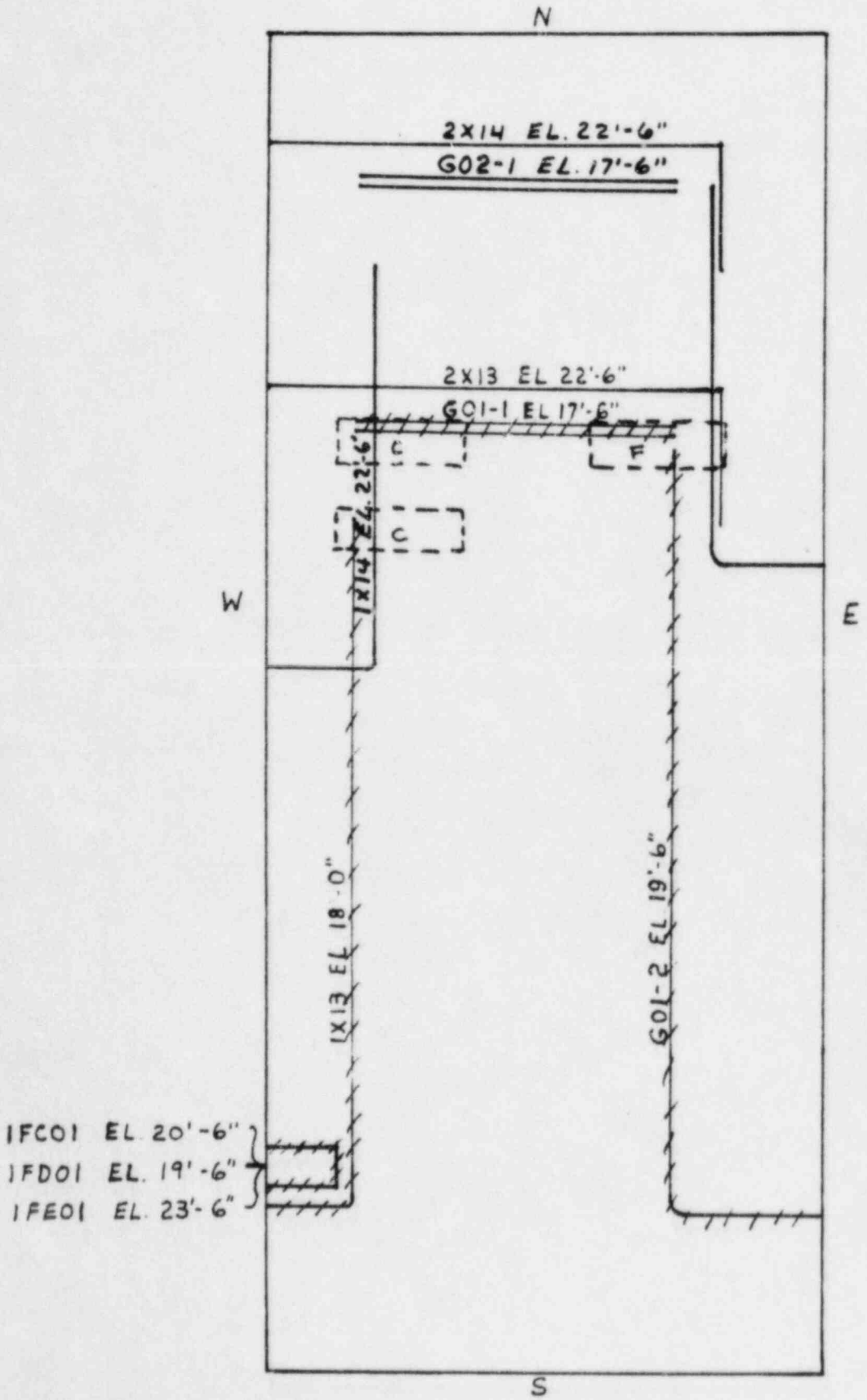
  AND....
  - 1 BOP 4160 Vac POWER TRAIN FROM GAS TURBINE
    - 1 FEED TO 480 VAC
- o THIS REPRESENTS EQUAL OR GREATER PROTECTION OF POWER FEEDS THAN REQUIRED BY RULE

FIGURE 5

SERVICE WATER PUMP CABLES

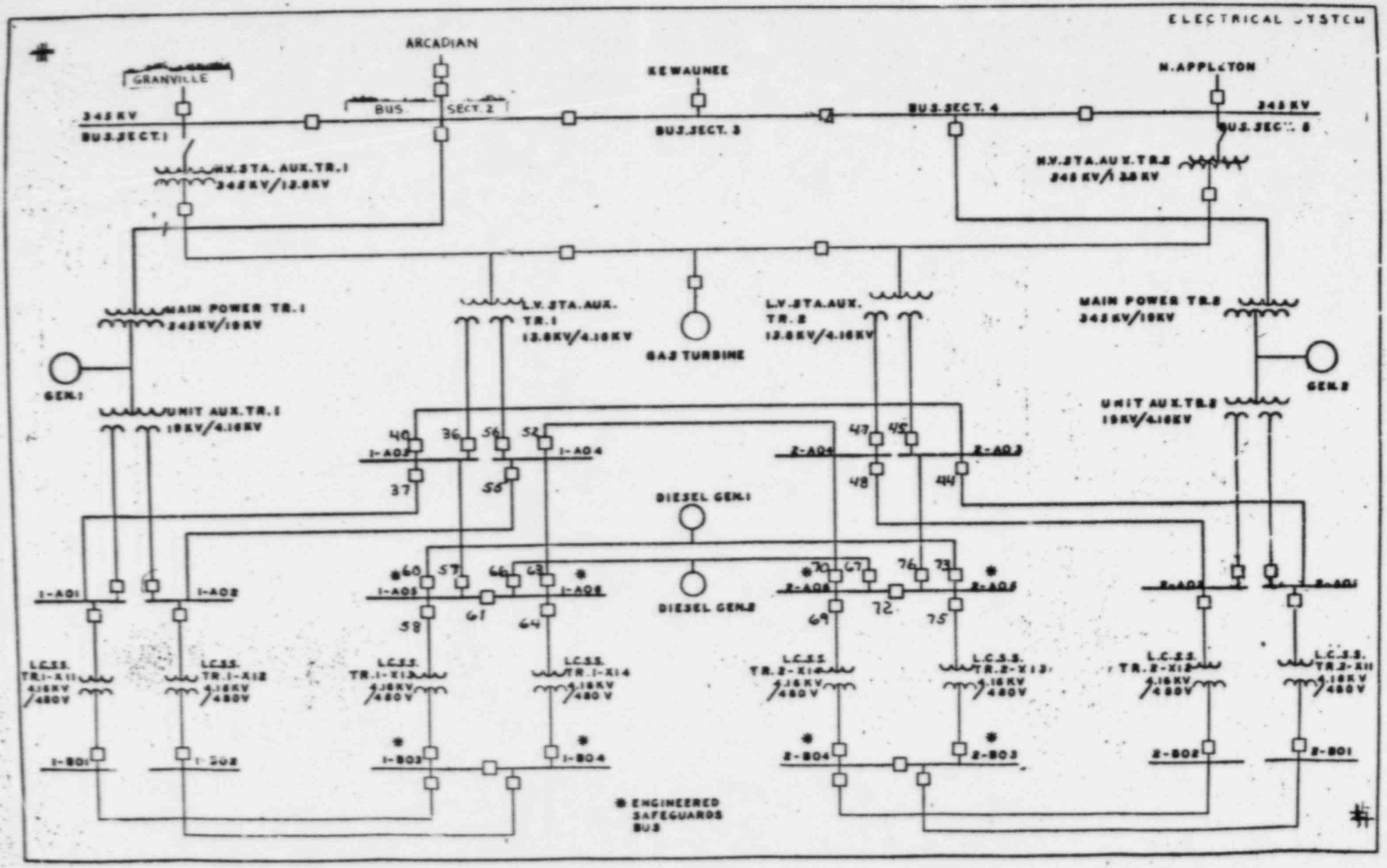


4160V SWITCHGEAR ROOM
POWER SUPPLY CABLE
LOCATION



REVISED SWTICHGEAR ROOM DESIGN BASIS

- o CONFORMS WITH STAFF SUGGESTIONS
- o VERY CLOSELY MATCHES INTENT OF RULE
- o ACHIEVES EQUIPMENT PROTECTION BY SIMULTANEOUSLY MEETING APPROPRIATE PARTS OF III.G.2.B & C
- o MAINTAINS BEST ATTRIBUTES OF PREVIOUS PROPOSED DESIGN CONCEPTS
- o COST EFFECTIVE RESOLUTION
- o MINIMIZES MAGNITUDE OF PLANT MODIFICATIONS
- o CONSTRUCTION IMPACTS
  - REDUCED
  - CONFINED
  - MANAGEABLE
  - MINIMAL IMPACT ON PLANT OPERATION


ELECTRICAL SYSTEM
ARCADIAN
GRANVILLE
KEWAUNEE
N. APPLETON
345 KV BUS SECT. 1
BUS SECT. 2
BUS SECT. 3
BUS SECT. 4
345 KV BUS SECT. 5
H.V. STA. AUX. TR. 1 345 KV/13.8 KV
H.V. STA. AUX. TR. 2 345 KV/13.8 KV
MAIN POWER TR. 1 345 KV/19 KV
L.V. STA. AUX. TR. 1 13.8 KV/4.16 KV
GAS TURBINE
L.V. STA. AUX. TR. 2 13.8 KV/4.16 KV
MAIN POWER TR. 2 345 KV/19 KV
GEN. 1
GEN. 2
UNIT AUX. TR. 1 19 KV/4.16 KV
UNIT AUX. TR. 2 19 KV/4.16 KV
40
36
56
52
1-A03
1-A04
37
55
2-A04
47
45
2-A03
48
44
DIESEL GEN. 1
DIESEL GEN. 2
1-A01
1-A02
*60
57
46
43
1-A05
1-A06
58
61
64
*70
67
76
73
2-A06
2-A05
69
72
75
2-A01
LCSS TR. 1-X11 4.16 KV/480 V
LCSS TR. 1-X12 4.16 KV/480 V
LCSS TR. 1-X13 4.16 KV/480 V
LCSS TR. 1-X14 4.16 KV/480 V
LCSS TR. 2-X14 4.16 KV/480 V
LCSS TR. 2-X13 4.16 KV/480 V
LCSS TR. 2-X12 4.16 KV/480 V
LCSS TR. 2-X11 4.16 KV/480 V
1-B01
1-B02
1-B03
1-B04
2-B04
2-B03
2-B02
2-B01
* ENGINEERED SAFEGUARDS BUS