Design Criteria

Ginna Station

TSC Batt - Vital Batt Intertie

Rochester Gas and Electric Corporation

89 East Avenue

Rochester, New York 14649

EWR 3398

Revision 2

November 10, 1982

Prepared by: John K. Smith — 11-11-82 (DATE)
Electrical Engineering

Reviewed by: C. R. Anderson — 11-11-82 (DATE)
Quality Assurance

Approved by: G. W. Daniels — 11-11-82 (DATE)
Manager, Electrical Engineering

Revision Status Sheet

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Design Criteria

1.0 Summary Description of the Design

1.1 Summary

The modification described below will provide a means to transfer either redundant vital DC load group ("A" or "B" train) to the Technical Support Center (TSC) battery. The system will consist of one manual, double throw, transfer switch, and cable to connect the vital 125V DC batteries to the 125V DC TSC battery. The transfer switch shall be provided with a key lock for the open position.

1.2 Functions

When a vital battery is unavailable either due to test, maintenance or failure, the load shall be manually transferred by means of a manual transfer switch to the TSC battery, and the vital battery isolated from the system.

1.3 Performance Requirements

The cables and switch used to connect the vital DC loads to the TSC battery shall be capable of supplying the full loading requirements of either load group.

1.4 Control

All control shall be manual.

1.5 Modes of Operation

The transfer system shall be capable of operation during all manual plant operations and after any battery failure, with the exclusion of fire in the battery room.

2.0 Referenced Documents

None.

3.0 Seismic Category

3.1 The fused disconnect switches located in the battery rooms and cable connections to the vital load groups shall be Seismic Category I.

3.2 All other structures and equipment associated with this modification shall be designated non Seismic Category I but shall be designed so that no seismic failure can degrade Class 1E systems.

4.0 Quality Group

Not applicable.

5.0 Code Class

Not applicable.

6.0 Codes, Standards and Regulatory Guides

6.1 The following codes, standards, and regulatory guides will be used as guidelines in the design of this addition and where required by regulatory guide will conform to that applicable standard or guide.

6.2 Nuclear Regulatory Commission (NRC)

6.2.3 Regulatory Guides

6.2.3.1 Regulatory Guide 1.75 - Physical Independence of Electric Systems (Rev. 1 - 1/75).

6.3 Institute of Electrical and Electronics Engineers (IEEE)

6.3.1	IEEE-383 (1974)	Guide for Type Test of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations.
6.3.2	IEEE-384 (1977)	Standard Criteria for Separation of Class 1E Equipment and Circuits.

6.4 Insulated Power Cable Engineers Association (IPCEA)

6.4.1	IPCEA P-54-440 (1975)	Ampacities - Cables in Open - Top Cable Trays.
6.4.2	IPCEA S-19-81 (1969)	Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
6.4.3	Interim Standard No. 1	Cables Rated 0-35,000 Volts and Having O Zone-Resistant Ethylene Propylene Rubber Insulation

6.4.4 IPCEA S-66-524 (1971) Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

6.5 American National Standard Institute (ANSI)

6.5.1 ANSI-N45.2.2 (1978) Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants.

7.0 Design Conditions

7.1 The transfer system will be such that the "A" and "B" 125V DC batteries cannot be tied together.

7.2 The cables and transfer switch will be designed to supply the full load of either "A" or "B" vital DC system, separately and not simultaneously.

8.0 Load Conditions

None.

9.0 Environmental Conditions

Ambient Temperature (°F)	40-120°F
Ambient Pressure (psig)	ATM
Relative Humidity (%)	60% nominal
Radioactivity (rads)	negligible

10.0 Interface Requirements

10.1 The proposed modification will interface with the existing 125V DC vital battery systems. The design of this modification shall be such that it does not degrade the ability of these systems to function according to their original design requirements.

11.0 Material Requirements

None.

12.0 Mechanical Requirements

None.

13.0 Structural Requirements

None.

14.0 Hydraulic Requirements

None.

15.0 Chemistry Requirements

None.

16.0 Electrical Requirements

16.1 Power cable used in this modification shall meet the following requirements.

16.1.1 Minimum voltage rating 600 volts.

16.1.2 Insulation and jacket shall be qualified in accordance with IEEE 383-1974.

16.1.3 Conductor sizes shall be selected to assure a negligible voltage drop in the feeder cable to the transfer switch at full load.

17.0 Operational Requirements

17.1 The Emergency Procedures should be reviewed, considering potential operator actions based on loss of vital 125V DC batteries.

18.0 Instrumentation and Control Requirements

Not applicable.

19.0 Access and Administrative Control Requirements

19.1 The double throw transfer switch shall be locked in position with the key controlled by the Shift Supervisor.

20.0 Redundancy, Diversity, and Separation Requirements

20.1 Cable routing shall meet the separation criteria of IEEE-384 (1977) to the extent practical given the existing plant configuration. Where IEEE-384 (1977) separation cannot be met the separation criteria of section 8.2.2 of the Ginna Station FSAR shall apply.

20.2 Internal separation of vital load group wiring in the transfer switch shall conform to IEEE-384 (1977).

21.0 Failure Effects Requirements

21.1 No failure of the transfer system shall degrade the vital 125V DC system.

22.0 Test Requirements

None.

23.0 Accessibility, Maintenance, Repair and Inservice Inspection Requirements

23.1 All enclosures shall be designed to allow easy access to the extent practical for maintenance, repairs and inservice inspection.

24.0 Personnel Requirements

None.

25.0 Transportability Requirements

Not applicable.

26.0 Fire Protection Requirements

26.1 Where cable installation requires cable insertion through a silicone foam fire stop or seal, care must be taken to prevent loss of seal integrity. Since the seal is established by the pressure of the silicone foam on the cable, rather than by adhesion, a new cable may be inserted if there is sufficient space available. After the cable has been fully inserted, the seal must be visually inspected on both sides to assure that the seal is still fully intact. If visual inspection reveals any damage to the seal it shall be repaired or removed and replaced.

26.2 The transfer system shall be designed to prevent a single fire from degrading both vital DC load power supplies or degrade the TSC battery when either vital DC power supply is isolated.

27.0 Handling Requirements

27.1 Cables shall be shipped and handled in accordance with Level C requirements of ANSI N45.2.2 (1972).

28.0 Public Safety Requirements

Not applicable.

29.0 Applicability

29.1 Materials and equipment purchased shall be specified such that they meet the intended requirements of this addition.

30.0 Personnel Safety Requirements

30.1 Due to the nature of this addition it is necessary that all electrical work be under the direction of a qualified electrician and that existing holding procedures be followed.

31.0 Unique Requirements

Not applicable.

A Quotation from... EXIDE POWER SYSTEMS DIVISION

ESB INCORPORATED

38 CARMAS DR
ROCHESTER NY 14626 ROCHESTER, N.Y.
TEL. (716) 225-7145 (ROCHESTER)
(716) 634-6111 (BUFFALO)

To: ROCHESTER GAS &ELECTRIC
89 EAST AVE
ROCHESTER NY

Date 10/17/80

Reference VERBAL-GEORGE DANIELS

WE ARE PLEASED TO QUOTE THE FOLLOWING BATTERIES FOR INSTALLATION AS A STATIONARY BACK-UP SYSTEM:

# CELLS	CELL TYPE	TOTAL AMP-HR CAPACITY	PRICE/CELL
60	GU- 23	2420 AMP HOURS	$670.00

ABOVE BATTERIES ARE THE LONG DURATION CALCIUM FLAT PLATE DESIGN
ABOVE PRICES INCLUDE:FLAME ARRESTORS,ALL INTERCELL CONNECTORS, HYDROMETER AND HOLDER,CELL LIFTING DEVICE,ONE SET OF CELL NUMBERS, TERMINAL PLATES,LUGSAND FASTENERS,FULL SET OF OPERATING AND INSTALLATION INSTRUCTIONS.

THE RECOMMENDED RACKS FOR THE ABOVE BATTERIES ARE AS FOLLOWS:

QUANTITY	LENGTH	CATALOG#	PRICE/EACH
6	84"/EACH	84797	$1800.00

ABOVE RACKS ARE OF THE SEISMIC TYPE FOR ZONES 2,3,&4(SPECIFICATIONS ARE INCLUDED)

DELIVERY TIME ON BATTERIES IS@14 WEEKS
" " " RACKS IS @ 10 WEEKS

ALL PRICES ARE FOB RICHMOND KENTUCKY

PROPOSAL SUBMITTED BY

Mike Bohan

MIKE BOHAN

THIS QUOTATION IS MADE SUBJECT TO THE TERMS AND CONDITIONS ON THE BACK OF THIS PAGE

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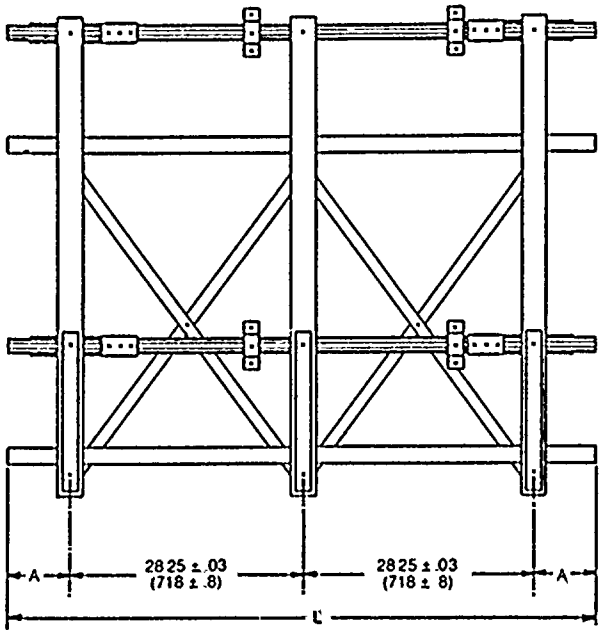
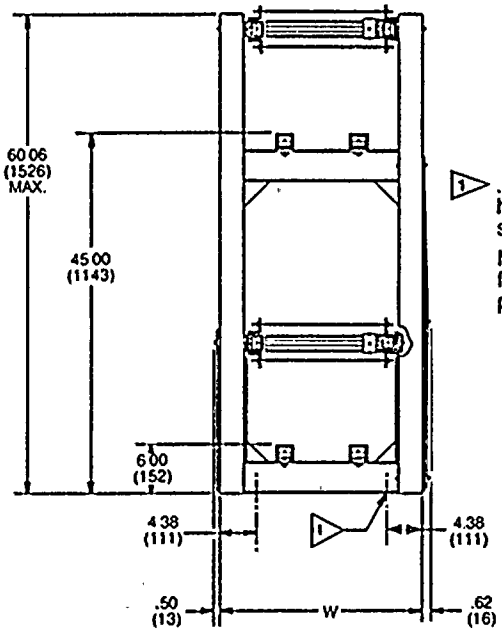
Exide

Zone 2, 3 and 4 (Seismic) Battery Racks

2 Tier 3 FRAME RACK SHOWN

FOR LEAD ACID BATTERIES: TYPE G ONLY





1 .56 in. (14 mm) diameter holes, (2) per-frame, for securing rack to floor.

Maximum overall height from floor to top of cell posts: 72.00 in (1829 mm)

INCHES—in.
(MILLIMETERS—mm)

RACK CATALOG NO.			CELL TYPE				NUMBER OF FRAMES PER RACK	L		APPROXIMATE A		APPROX. SHIPPING WEIGHT	
W = 24.75 (629)	W = 22.00 (559)	W = 26.25 (667)	GA/GC-9 to 15 GA/GC-25 to 33 GT/GU-9 to 21 GX-5 to 17 GN-11 to 15 GW-17 to 29	GA/GC-17 to 23 GX-19 to 25 GN-17 to 23	GX-26 to 34 GN-26 & 30	GA/GC-35 to 45 GT/GU-23 to 45 GN-34 to 46 GX-38 to 50		In	(mm)	In	(mm)	lbs	(kg)
			MAX. NUMBER OF UNITS PER RACK										
84784	84773	84795	8	6	6	6	3	60.00	1524	1.75	44	547	248
84785	84774	84796	10	8	8	8		72.00	1829	7.75	197	565	256
84786	84775	84797	12	-	10	10		84.00	2134	13.75	349	583	264
84787	84776	84798	14	10	12	12	4	96.00	2438	5.62	143	744	337
84788	84777	84799	16	12	-	-		108.00	2743	11.62	295	762	346
84789	84778	84800	18	-	14	14	5	120.00	3048	3.50	89	923	419
84790	84779	84801	20	14	16	16		132.00	3353	9.50	241	941	427
84791	84780	84802	22	16	18	18	6	144.00	3658	0.00	0.00	1102	500
84792	84781	84803	24	18	-	-		156.00	3962	7.38	187	1120	508
84793	84782	84804	26	-	20	20		168.00	4267	13.38	340	1138	516
84794	84783	84805	28	20	22	22	7	180.00	4572	5.25	133	1299	589

2 Tier Battery Rack

Notes:

1. Zone 2, 3, and 4 (seismic) battery racks are designed to be installed and used according to the methods described by ANSI N41.24-1976 and IEEE Standard 484-1975.
2. Each rack employed must stand alone. No racks are to be butted end to end. Minimum clearance between the rack and any object, e.g., walls or other racks, must be 4.00 in (102 mm).
3. Each frame within a rack must be anchored to the floor with ½ in (12 mm) diameter bolts, SAE Grade 5 or ASTM A-499 or better. The threaded portion of each bolt must extend 1.12 in (28 mm) to 1.75 in (44 mm) above the floor surface. Determination of the method to be used to secure the anchor bolts to the floor is the responsibility of the customer.
4. The entire rack is painted with two coats of acid-resisting ASA #61 gray paint.
5. Assembly instructions: See Catalog Section 58.09.
6. For additional information about selecting the proper rack type, see "Rack Selection Guide" — Catalog Section 55.01.

EXIDE INDUSTRIAL BATTERY DIVISION
ESB INCORPORATED
HORSHAM, PA 19044

FORM 8122 7-79

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