

Section No.: 5.1

CEA: 1800

Date: January 2, 1968

Author: H.B. Dygert/
K.J. Johnston

Approved by: R.B. West

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Revision 1 January 25, 1968

ELECTRICAL DESIGN BASIS

for the

ELECTRICAL FACILITIES

within the

PROJECT BATTERY LIMITS

Project: Aroclor Expansion

Division: Organic

Plant: Wm. G. Krummrich

Plant Location: Sauget, Illinois

Electrical Design Section
Central Engineering Department
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

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TOWOLDMON0045767

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1. References

Project Scope Report	8/29/67
Project Organization and Procedure	9/22/67
Estimate Work Sheet 03-0.82	9/1/67
Equipment List	4/10/67
Scope of Work	8/28/67
Master Project Schedule Area 01	12/8/67
" " " " 02	12/19/67

2. Introduction

This Electrical Design Basis describes the inbattery limits electrical systems (bonding, control, communications, grounding, instruments, lighting and power) that will be designed by the members of the Electrical Design Section for the Aroclor Expansion project.

The appropriation for the Electrical facilities is as follows:

<u>Code Category</u>	<u>Amount</u>
01	\$16,730
04 (Electrical Only)	10,000
10	0
13	<u>62,000</u>
Total Capital for Equipment, Material and Labor	\$88,730
80 (Cost Center 45)	10,000
90, 92, & 93 (Expense)	1,700

3. General Description of the Electrical Facilities

Installation in the process area includes lighting in operating area of 15-400 square feet bays, one 15 foot by 15 foot CONTROL ROOM, and one 15 foot by 15 foot FOREMAN'S OFFICE. Approximately thirty motors are to be installed and wired with remote pushbuttons and alarms for approximately 15 of them. The starters for all motors on this project will be part of a new M.C.C. Installation in Sub. No. 17 consists of a new 600 ampere breaker and fans on the existing transformer. One 600 ampere feeder will be installed from Sub #17 to Bldg. CF, and one 400 ampere feeder will be installed from Sub #8 to the new MCC.

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In the storage area approximately 4 motors with local and remote pushbuttons, plus approximately 8 street lights will be installed. Approximately 8 additional light fixtures will be installed over the tank farm area.

4. Project Risk

No risk involved.

5. Electrical Equipment and Material Removal

2 motors on underground tanks, equipment numbers 66-0853, 66-1501.

6. Schedule - Area 01

Electrical Design Completion	Feb. 19, 1968
Electrical Drawing Completion	March 4, 1968
Start Construction on Project	March 18, 1968
Startup Date on Project	July 1, 1968

Area 02

Electrical Design Completion	July 1, 1968
Electrical Drawing Completion	July 29, 1968
Start Construction on Project	July 1, 1968
Startup Date on Project	Dec. 2, 1968

7. Drawings Electrical

There will be approximately 25 new drawings and revisions to approximately 4 existing drawings. See attached list.

8. Electrical Purchasing

CED will purchase motors, motor control centers, pushbuttons, relays, panels, lighting fixtures, power transformers, circuit breakers, and feeder cables. Instrument Group will specify thermocouple wire. The contractor will provide all wire, conduit, conduit fittings, hangers, lamps and fuses.

9. Construction and Startup Assistance Provided or Arranged for by the Electrical Design Section.

No vendor assistance is anticipated. Electrical Design personal assistance should be minimal and is available at the request of the Project Manager.

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10. Completion Criteria

This project will be considered to be electrically complete when all electrical equipment that was scheduled for removal has been removed, and all new electrical equipment has been properly installed and the operation of the new electrical equipment has been demonstrated to be satisfactory to the Project Manager and to the Plant Manager or his designee.

11. Electrical Codes

All electrical installations shall be in accordance with the latest National Electrical Code.

12. Electrical Standards

This project will use those electrical items and materials that are covered by the CED Electrical Standards as applicable to the Krummrich Plant.

13. Hazard Classification

All project areas are non-hazardous.

14. Special Corrosive or Dust Conditions

PVC conduit will be used because of the corrosive atmosphere. A cable tray to the building will reduce the amount of conduit required.

15. Power Supply Requirements and Source of Power

	Estimated Demand	Installed
440 volts 3 Phase 60 Hertz power for motors	150 KVA	290 HP
440 volts 3 Phase 60 Hertz power for heaters	0	0
440 volts 3 Phase 60 Hertz power for lighting	15 KVA	15 KVA
120 volts 1 Phase 60 Hertz power for Instruments	5 KVA	5 KVA
	270 KVA	20KVA+290HP

In Sub #17 cooling fans will be installed to uprate the transformer and a 600 amp breaker will be installed to supply Bldg. CF, presently fed by Sub 8. The replaced circuit (8-1) will feed the new Motor Control Center.

16. Wiring Systems

All wire will be copper and stranded. No conductor smaller than #14 will be installed. Control wire will be #14, lighting conductors will be #12 and above. Type THW 600 volt insulation is specified.

17. Supports for Conduit and Equipment Mounting

In the Tank Farm area conduit will be supported by beam clamps connected to steel members of the pipe bridges. In the production area beam clamps and trapeze type hangers connected to the building steel will support the conduit.

18. Motors

Approximately 33 motors will be installed for this project. See attached list.

19. Motor Control Centers

The Motor Control Center will be a front access NEMA 1A enclosure with Type B wiring and fusible disconnect switch combination starters. The Motor Control Center shall consist of approximately 17 size 1 starters, 11 size 2 starters, one size 3 starter, 3-60 amp disconnect switches, and 4 size 1 two speed starters.

All starters will have 480 to 120 volt control transformers.

20. Motor Control Circuit Requirements

Approximately 15 Motors require local and remote pushbutton stations with alarms on shutdown.

The chlorine feed will be interlocked with the circulating pump, and low temperature in the chlorinator circulating line will alarm and shut off air cooler fan. The remaining motors require local pushbutton stations only. The tank farm pumps will have remote pushbuttons at the loading stations.

21. Conductor Identification

Control circuit conductors will be labeled at all terminal blocks and devices using Brady 500 Wire Markers with the numbers and/or letters, that are indicated on the appropriate electrical drawings.

22. Lighting Systems

This project will provide lighting for 15-20' x 20' bays for manufacturing at 20-25 foot candles, loading docks and tank farm area at 10-20 foot candles, a motor control Room at 30 foot candles and a foreman's office at 70-90 foot candles.

23. Bonding and Grounding (Earthing) Systems

Power Systems: All noncurrent carrying parts of Electrical equipment will be connected to the Motor control Center grounded buss through the conduit system with grounding type bushings at the equipment.

The Building addition shall be grounded with ground rods located near and bonded to every other build column. In the Tank Farm area individual ground rods will be located near and bonded to the tanks for grounding. Tanks inside the building will be sufficiently grounded through mounting connections to structure and inter connecting piping.

24. Unit Heaters, Heating and Ventilating Equipment

Approximately 2 electric space heaters will be used in the Motor control room and Foreman's office.

25. Annunciator Alarm System

There will be alarms on approximately 15 motors.

26. Equipment Nameplates

Supplied by CED

27. Interlocks

The interlocking required is described in paragraph 20.