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THE THIRTIETH IEEE CEMENT INDUSTRY TECHNICAL CONFERENCE

May 24 – 26, 1988

HILTON HOTEL, QUEBEC CITY, CANADA

Sponsored by
The Industry Applications Society's
Cement Industry Committee
of the
Institute of Electrical and Electronics Engineers, Inc.

This year, we are celebrating 30 years of continuous activity. This accomplishment has been made possible by the will, dedication and professionalism of the Cement Industry Committee Members, the Annual Program Committee Members and to those members we give our thanks and gratitude.

The Technical Papers contained in this Conference Record have been prepared using guidelines from the «Authors Guide» of the Industry Applications Society (IAS) modified by the Cement Industry Committee. We hope these papers concerning the various subject matters will be useful to you and help in giving added valuable information related to your areas of responsibilities.

We wish to take this opportunity to thank you for attending our Conference and may you have as much enjoyment in Quebec City as we have in hosting you.

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UTILITY USER INTERFACE

ABSTRACT

Cement plants being large users of electricity they are normally supplied by high voltage power lines. The security must be increased and the money involved by both parts, the client and distributor, justify a close relation to assure that the power interruptions be limited to the minimum possible and also the time required to make a safe switching operation.

BY

YVES VÉZINA

CHARLES TARDIF

GRATIEN BOULIANNE

HYDRO-QUEBEC

FOR PRESENTATION AT THE I.E.E.E. CEMENT INDUSTRIE CONFERENCE

MAY 1988

QUEBEC

CANADA

ABSTRACT

Cement plants being large users of electricity they are normally supplied by high voltage power lines so the security must be increased and the money involved by both parts, (the client and distributor), justify a close relation to assure that the power interruptions be limited to the minimum possible and also the time required to make a safe switching operation.

The quality of customer service is an ever-increasing concern for public utilities, under adverse and variable weather conditions, this concern is particularly acute and the complexity of its distribution system with various load densities only adds to the challenge.

Acceptable levels on service quality cannot be attained without highly reliable lines and apparatus, optimum protection criteria together with line and sectionalizing configurations. These topics are covered in this paper, starting with a general description of the distribution system, the customer protection, the line and sectionalizing configurations, and, finally, the main electrical characteristics of the equipment.

You will find below what should be done before during and after the establishment of electricity supplied by utility to a new Cement Plant plus a coordinated procedure of maintenance of the equipments.

UTILITY USER INTERFACE
DURING INITIAL START-UP
INTRODUCTION

This paper describes utilities approach to the security required to feed cement plants, normally fed by high voltage power lines and the economics involved by limiting the power interruptions to a minimum through better maintenance coordination, by the customer and the utility company.

The procedure to initially feed a new cement plant would look like this:

- 1.- Before initially feeding the cement plant, a visit is made to the customer by the utility personal to make sure that the customer's installation meets the characteristics of the diagram submitted by the customer and accepted by the utility. They will jointly determine the date, the required time and the persons involved in the switching operations. They will then make sure that the customer's equipment is clearly indentified with indentification plates.
- 2.- During the initial switching operation, a utility coordinator will be at the plant to assure a good coordination of the switching operations for the initial test of the customer's substation.
- 3.- Thereafter, the collaboration of the customer and the utility is necessary to coordinate the maintenance of each other's equipment.
- 4.- The customer must at this point check his protection as soon as the substation is fed.
- 5.- The customer has to check the voltage at different points in his substation and the motor rotation verified.

ABSTRACT

UTILITY USER INTERFACE

BEFORE SUPPLYING ELECTRICITY

A visit at the customer's electrical substation must be done by utility's employees to make sure that it meets the characteristics of the diagrams accepted by the utility and to identify the electrical equipment of the substation in order to make a single line diagram, (annex 1) and identification plates for that equipment.

A verification of the customer's electrical protection is made to insure that it coordinates with the utility's. The procedure of connecting the customer's substation to the utility's power lines will be explained and the employees involved by both parts designated.

The security rules applied by utility and operational language used during the work will be explained. A tentative time and date of electricity supply at the connection point will be determined.

UTILITY USER INTERFACE

DURING INITIAL START-UP

A utility specialist will be at the cement plant to assist the customer during the initial start-up test and he will be responsible for establishing the communication between the system operator and the customer's electrician.

A verification is made to insure that all the electrical substation disconnects and high voltage breakers are in the open position and the protections are operational. A step by step test of the customer's equipments will be made using with the following procedure:

- 1.- 743 line will be de-energized to permit closing of the 743-2 disconnect by the customer.
- 2.- 743-2 disconnect is closed to prepare B743 circuit breaker test.
- 3.- 743 line is energized by the utility to test B743 circuit breaker.
- 4.- The same procedure will be used to test the bus bar, transformers and other circuit breakers by operating the customer's circuit breaker 743.
- 5.- The phase displacement will be checked between 743 and 753 lines by utility employees with phasing sticks.
- 6.- The customer must at this point, check his protection as soon as the substation is fed.
- 7.- The customer has to check the voltage at different points in his substation and the motor rotation verified.

UTILITY USER INTERFACE

AFTER INITIAL TEST

A visit to the electricity distributor system operation office by the cement plant employees should be arranged to let the people involved in switching operations get acquainted for better communication.

The maintenance of customer & distributor equipment should be well coordinated to minimize the frequency and length of interruptions. Cement plant, suffering naturally from dust pollution, should be cleaned up regularly to prevent power interruptions. The distributor will also benefit of these interruptions to do its maintenance on the power lines feeding the client.

The customer should realize that unscheduled interruptions can easily double in time compared to schedule power outages due to the time involved in finding the personal, finding the problem that caused the interruptions and gathering the material necessary to make the repair.

We should consider that the minimum time required to do a small and safe maintenance work on a power line, will be about 6 hours because of:

- The communications to be established between the utility system operator and the customer to start the switching operations.
- The switching operation to be done by the mobile operating staff to isolate the line
- The security measures that are required (locking and tagging of all the disconnects on the power line) to insure the security of the linemen and the other maintenance personal.
- The issuing of the work permits by the system operator to the personal working on the line.
- And finally the application of ground sticks on the work site before any work can begin.

When the work is completed on the line, all of the above mentioned steps have to be done in reverse.