1991 IEEE Cement Industry Technical Conference XXXIII

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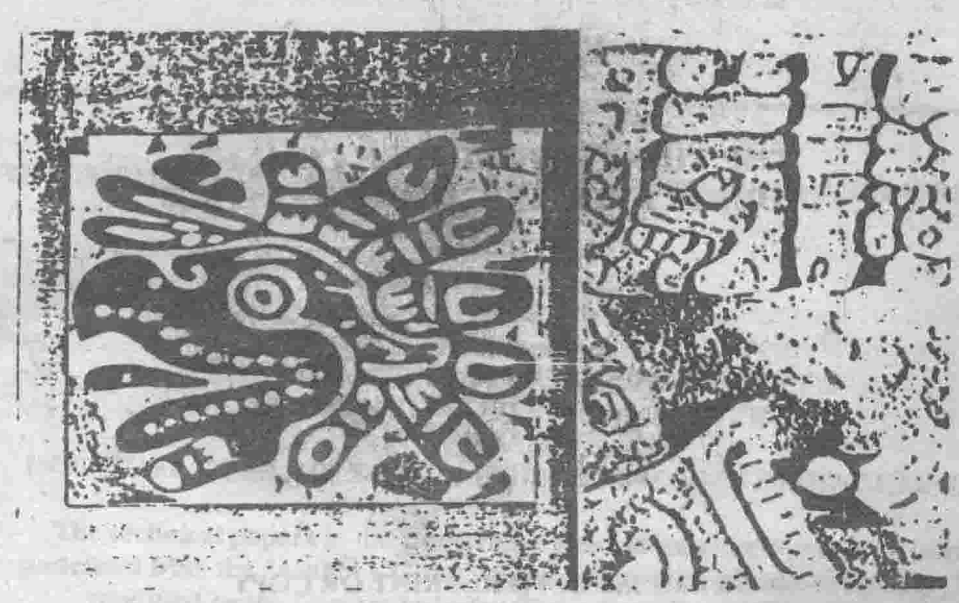

IEEE Cement Industry Technical Conference XXXIII
Mexico City, Mexico May 21-23, 1991

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THE THIRTY-THIRD IEEE CEMENT
INDUSTRY TECHNICAL CONFERENCE

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FOREWORD

THE THIRTY-THIRD IEEE CEMENT INDUSTRY TECHNICAL CONFERENCE

May 21-23, 1991
MEXICO CITY,MEXICO.

Sponsored by
THE INDUSTRY APPLICATIONS SOCIETY'S
CEMENT INDUSTRY COMMITTEE
OF THE
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

The technical papers in the Conference Record have been prepared using guidelines from the "Author's Guide" of the Industry Applications Society (IAS) modified by the Cement Industry Committee. The IAS is comprised of twnety-eight Technical Committees including the Cement Industry Committee.

This year's Annual IEEE Cement Industry Technical Conference completes thirty-three years of such Conferences. This is the second time that Mexico has been selected as the site, the first being in 1974.

The papers included in this Record are written and are presented to comply with the scope for the Cement Industry Committee which has been established by the IEEE Industry Applications Society. In substance, this scope is:

"The development and application of electrical systems, apparatus, devices, and controls to the processes and equipment for which the emphases or dominant factors specifically relate to the cement manufacturing industry; the promotion of safe, reliable, and economic installations; the encouragement of energy conservation; and the creation of voluntary engineering standards and recommended practices."

The dedicated work by many Cement Industry Members supporting the activities of the Institute (IEEE) is appreciated. Thanks also to the many cement industry related firms & employees and others who attend this Thirty-third IEEE Cement Industry Technical Conference.

J:R. Treviño Salinas
Conference Chairman

N.W.Biege
National Committee Chairman

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1991 - Mexico City
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1992 - Dallas
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1993 - Toronto
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IEEE CEMENT INDUSTRY TECHNICAL CONFERENCE HISTORY

	YEAR	WHEN	WHERE	NATIONAL CHAIRMAN	PROGRAM COMMITTEE CHAIRMAN	APPROX. REG.
1st	1959	4/15-16/59	Allentown, PA	W.A. Allan	A.H. Huelsman	298
2nd	1960	5/17-19/60	Milwaukee, WI	W.A. Allan	V.B. Murdock	316
3rd	1961	4/18-20/61	Detroit, MI	J.F. Hower	L.E. Swanson	307
4th	1962	4/3-5/62	St. Louis, MO	J.F. Hower	J.B. Woodward	437
5th	1963	4/23-25/63	Cleveland, OH	R.J. Jager	G.E. MacDonald	304
6th	1964	4/14-17/64	Pasadena, CA	R.J. Jager	D.B. Carson	433
7th	1965	5/11-13/65	Allentown, PA	H.P. Cassel	C.A. Zimmerman	601
8th	1966	5/17-19/66	Denver, CO	H.P. Cassel	W.A. Walkling	436
9th	1967	5/16-19/67	Albany, NY	L.E. Swanson	J.R. Kelley, Jr.	479
10th	1968	5/20-24/68	St. Louis, MO	L.E. Swanson	A.C. Lordi	515
11th	1969	5/13-15/69	Toronto, Ontario	A.C. Lordi	J.A. Allan	501
12th	1970	5/12-14/70	Indianapolis, IN	A.C. Lordi	G.F. Messinger	453
13th	1971	5/10-13/71	Seattle, WA	J.A. Allan	F.J. Bauer	370
14th	1972	5/16-18/72	Detroit, MI	J.A. Allan	L.E. Swanson	464
15th	1973	4/30-5/3/73	Miami, FL	R.P. Kistler	L.W. Copple	503
16th	1974	5/13-16/74	Mexico City, Mexico	R.P. Kistler	R.J. Plass	676
17th	1975	5/5-8/75	Montreal, Quebec	F.J. Bauer	M.S. Jackson	583
18th	1976	5/17-20/76	Tucson, AZ	F.J. Bauer	J.A. Vidergar	587
19th	1977	5/16-19/77	Omaha, NE	R.C. White	F.E. Staples & R.F. Palmer	570
20th	1978	5/15-18/78	Roanoke, VA	R.C. White	K.C. Wiles	677
21st	1979	5/20-24/79	Tarpon Springs, FL	Jay Warshawsky	F.W. Cohrs	829
22nd	1980	5/19-22/80	Toronto, Ontario	Jay Warshawsky	M.E. Wrinkle	839
23rd	1981	5/12-14/81	Lancaster, PA	L.L. Warner	N.W. Biege	841
24th	1982	5/24-26/82	Vancouver, BC	L.L. Warner	B.T. Price	595
25th	1983	5/22-27/83	San Antonio, TX	N. Roistacher	U. Alsguth	622
26th	1984	5/22-24/84	Anahemim, CA	N. Roistacher	J.A. Vidergar	563
27th	1985	5/20-22/85	New Orleans, LA	R.J. Krekel	L.C. Cockrell	595
28th	1986	5/19-22/86	Salt Lake City, UT	R.J. Krekel	R.W. Riegel	490
29th	1987	5/26-28/87	San Francisco, CA	R.F. Palmer	C.D. Maars	557
30th	1988	5/24-26/88	Quebec City, Quebec	R.F. Palmer	A. Morneau	560
31st	1989	5/15-17/89	Denver, CO	Ib Bentzen-Bilkvist	Ed Parker	546
32nd	1990	5/22-24/90	Tarpon Springs, FL	Ib Bentzen-Bilkvist	E.A. Buehler	
33rd	1991	5/21-23/91	Mexico City, Mexico	N.W. Biege	Jose R. Treviño S.	
34th	1992		Dallas,Tx	N.W. Biege	Patton Caldwell	

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AUTOMATION SYSTEM AND INTEGRATED CONTROLS USED AT DAVENPORT CEMENT COMPANY BUFFALO PLANT

by

Steven L. Bassler
George J. Fergades

DAVENPORT CEMENT COMPANY

FOR PRESENTATION AT THE
IEEE CEMENT INDUSTRY CONFERENCE
MAY 26 - 30, 1991
MEXICO CITY, MEXICO

AUTOMATION SYSTEM AND INTEGRATED CONTROLS USED AT DAVENPORT CEMENT COMPANY BUFFALO PLANT

ABSTRACT

The type of control system that is used to operate a modern cement plant can be obtained and installed in many different configurations.

This paper will describe the automation system with its integrated controls presently in use at the Buffalo plant of Davenport Cement Company. Following a brief description of the plant itself, the focus of the following discussion will be to describe the hardware and software control strategies being used.

The conclusion will indicate the success obtained at the Buffalo plant by using the main distributed control system, in combination with programmable controllers, to control every aspect of the cement manufacturing operation.

INTRODUCTION

There are many computer based control systems available on the market today. During the design of a new facility or the upgrading of an older one, selection of the control system is of utmost importance.

Some of the major criteria during consideration of a control system should be:

1. System reliability and performance history.
2. Control philosophy to be utilized at the facility.
3. System Master/Reserve fail-over capability.
4. Type of operator interface.
5. Ease of system programming, with flexibility to make changes while on line.
6. Equipment environmental considerations.
7. Training and vendor support.

After conquering some initial hardware and software problems, the distributed control computer system as it exists today was found to be both reliable and easy to work with.

AUTOMATION AND CONTROL SYSTEM

A. Plant Overview

The existing Davenport Cement Company plant located at Buffalo Iowa, had its origins in a plant that was built in the 1920's. At that time it was called Dewey Portland Cement Company.

The preliminary engineering for a new facility was started in 1978 (figure 1). Construction was also started in that same year, with an estimated project completion by late 1981. The primary crusher was run in April of 1981 and the first clinker was produced on December 28, 1981. The facility (which is a preheater, precalciner plant) was designed to produce 850,000 TPY of finished cement using the following major equipment:

Primary Crusher
The limestone and clay raw materials are crushed in a 1750 hp impactor type crusher rated at 1300 TPH of minus 3 1/2" diameter rock.

Raw Grinding
The crushed rock is then ground using a 1500 hp roller mill that has a capacity of 230 tons per hour.

Kiln And Preheater
The kiln measures 197 ft by 13 ft. It is fed from a four stage preheater/precalciner that rises to a height of 320 ft.

Finish Mill
Finish grinding is accomplished by means of a 51 ft long, 15 ft diameter two compartment ball mill. The 7000 hp mill has a capacity of approximately 150 tons per hour.

Automation And Control System
The main process control system is a L&N CODIL VI distributed control system.

The balance of this paper will outline and discuss the distributed control concept presently in use at our manufacturing facility.