

STANDARD PROCEDURE INSTRUCTION

Title		SPI
Electronic Controllers		# 30-11
Department	Supersedes SPI	Effective Date
Divisional	Dated	1993
	Dec. 21/90	

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1. PURPOSE

- 1.1 To provide guidelines for establishing a chain of command to control the access to all electronic controllers in the Manitoba Division.
- 1.2 To establish the procedure for the security of operating programs and data for electronic controllers.
- 1.3 To establish the procedure for adequate documentation of electronic controller systems.

2. BACKGROUND

- 2.1 Electronic controllers are used extensively in our industry to control and monitor our

processes. They exist today in all Surface Plants, Office and Mines in the Manitoba Division.

- 2.2 Each operating area has electronic controllers of their own selection and is responsible for their operation and upkeep.
- 2.3 A policy for the care and operation of electronic controllers has evolved in each of the operating areas as working knowledge of them has expanded.

3.0 SCOPE

- 3.1 To be used by all Plant Managers to control the access to electronic controllers in their operating areas.
- 3.2 To be used by all Plant Maintenance Supervisors in the on-going daily upkeep of the electronic controllers.
- 3.3 To be used by all Engineering groups who are involved in the design and implementation of electronic controllers used for process control and monitoring.

4. DEFINITION OF TERMS

- 4.1 Electronic Controllers: A programmable electronic device which is microprocessor based and is used in the process operations of the Manitoba Division; ie: PLC, Videospec, OSCA, SAFE, Chamelion, etc.
- 4.2 Program: Coding which causes an electronic controller to operate in a designed manner; ie: manufacturer's operating system or fortran/etc. programs written by Vale Personnel to monitor or control a specific process in a predetermined manner.
- 4.3 Data: Information about the process which is gathered and stored by the electronic controller; ie: operating data gathered at predetermined time intervals and stored electronically.
- 4.4 Create: Write a program code which does not exist.
- 4.5 Modify: The addition or deletion of program code in an existing program.

- 4.6 Maintenance: The field manipulation of program parameters or variables that are allowed by program code to be made at the standard operators input device; ie: timer settings, forces, PID tuning parameters, etc.
- 4.7 Backup: A duplicate of the existing program code and data, recorded on magnetic media, suitable for massive, quick restoration into an electronic controller.

5. CHAIN OF COMMAND

- 5.1 Access to electronic controllers must be strictly controlled to safeguard personnel, equipment and quality of production. Only those persons identified below shall have access to electronic controllers that would have an impact on the way a process is controlled.
- 5.2 Level 1: Each Plant Manager shall appoint a System Coordinator who shall be the level 1 person for that plant.
- 5.3 Level 2: Program Designer on an appointed basis and acceptable to level 1 person.
- 5.4 Level 3: Each Plant Manager in cooperation with their Service Management shall appoint the level 3 person for that plant.
- 5.5 Level 4: Individually appointed on a process basis by level 3 person.
- 5.6 Level 5: Trainee in the field of electronic controllers.

6. RESPONSIBILITIES

- 6.1 Level 1 shall be technically competent, is the system coordinator and shall be responsible for the programming for a given plant. It will be his responsibility to maintain programs and provide initial and/or on-going training for the lower levels as required. Some or all of these duties may be delegated as required.
- 6.2 Level 2 shall be responsible for programming and/or supervising programming for a given plant, as designated by level 1. He supplies initial documentation and provides initial training to lower levels, as required by level 1.
- 6.3 Level 3 shall be responsible for administering the maintenance of existing process controls

(this would normally be a maintenance Supervisor). There is a possibility that the field supervisor may not be fully familiar with all his equipment and processes. In this case, he would seek the assistance of level 1 or in some cases a level 4. The Supervisor must be given the opportunity to obtain adequate training on electronic controllers and plant processes.

- 6.4 Level 4 has been given adequate training in the specific equipment and process operation and shall be responsible for maintaining the equipment or processes as delegated to him by level. 3
- 6.5 Level 5 shall be in a position of trainee of any one of the higher levels.
- 6.6 The number of personnel in each level will be determined by the size and complexity of a system and will be established by Plant Management or their designates.

7. DOCUMENTATION REQUIREMENTS

- 7.1 Lack of documentation produces an extremely volatile state where changes, techniques, algorithms and intent may be lost with the loss of one employee. For this reason, an extensive documentation process must be established.
- 7.2 Documentation shall be maintained during construction, commissioning and operation of any electronic control system. It shall consist of any or all of the following:
 - 7.2.1 Current program coding and data back-ups.
 - 7.2.2 Maintenance manuals and troubleshooting guides.
 - 7.2.3 Easy-to-read operating instructions and procedures.

7.2.4 Program print-out.

7.2.5 I/O and register listing.

7.2.6 Engineering drawings, schematics, PID's and cabling diagrams.

7.2.7 Easy-to-read functional description of the process being controlled.

B. PROGRAM AND DATA BACK-UPS

- 8.1 It is the responsibility of the person who creates or who modifies a program to make a back-up of the entire operating program at the time the program is installed or modified. An up-to-date, back-up copy shall be kept on the plant site, in a location known to the responsible people in the plant. A second back-up copy shall be kept away from the plant site; ie: General Engineering, neighbouring plant, your home, etc. The exact location of the off-site back-up copy will be as authorized by the level 1 person.
- 8.2 Data collected by the electronic controllers must be backed up if it is to be used for historical, legal, operating or analytical record keeping purposes. The frequency of data back-ups is to be determined by the Level 1 person, keeping in mind the value of the data and the ease with which it can be reproduced. It is highly recommended to perform regular data back-ups in whatever format necessary to allow recovery under most imaginable breakdowns of the electronic hardware.
- 8.3 The archive control of program coding and data back-ups shall be under the authority of the level 1 person.

9. MAINTENANCE AND OPERATING AND INSTRUCTIONS AND PROCEDURES

- 9.1 It shall be the responsibility of the Program Designer and Operations Personnel to create the documentation required in Article 7.2 above.
- 9.2 The documentation required under Article 7.2 above shall be distributed throughout the plant site as instructed by Plant Management.

10. ENGINEERING DRAWINGS

10.1 Engineering drawings shall consist of at least the following documents:

10.1.1 Equipment location drawings.

10.1.2 Program schematics.

10.1.3 Cabling diagrams.

10.1.4 Connection diagrams.

10.1.5 Equipment specification/identification sheets.

10.1.6 Process flow/control diagrams.

10.2 All of the above items shall be maintained "on-site" during installation and commissioning. On completion and at any time thereafter, any changes shall be submitted to General Engineering for record updating.

APPROVED _____ (VICE-PRESIDENT, MANITOBA DIVISION)

DATE

APPROVED _____ General Manager – Manitoba Operations

DATE _____