Pacific Gas and Electric Company
Gas Transmission

PG&E

Recommended Practice

Number: RP 4281
Revision: 1

Issuing Department: **GAS SYSTEM TECHNICAL SUPPORT**
Manager: **D. W. ANDERSON**

Effective Date: 1 Jan 1998
Review Date: 1 Jan 2000

SUBJECT: Procedure for Revising, Documenting, and Filing Application Software for Microprocessor-Based Controls Equipment

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Objective

This Recommended Practice establishes procedures to ensure that all revisions made to Application Software or Application Program are performed in a uniform manner and are properly documented and filed.

Scope

These procedures apply to Application Software or Application Programs for any electronic microprocessor-based control device that is programmed, owned, operated, and maintained by the Gas System Maintenance Department (GSM). Included are devices such as Programmable Logic Controllers (PLC), Flow Computers used for control or which interfaces with control systems, Operator Interface Terminals (OIT), Single and Multi-loop Controllers, etc.

These procedures do not apply to: (a) devices which only can be programmed by the Original Equipment Manufacturer (OEM) due to warranty or manufacturer restrictions (e.g. Woodward Unit Controls); (b) equipment having programs which cannot be downloaded to electronic storage disk (e.g. Panelmate OIT); (c) stand alone flow computers (e.g. TotalFlow flow computers used for well-head calculations); and (d) Application Software relating to SCADA or for other microprocessor-based devices that are programmed and maintained by other departments (e.g., GSO).

Definition

Application Software or Application Programs: Refers to the code developed (or supplied with) any electronic microprocessor-based device. This includes logic, configuration, field parameters, alarm limits, etc.

Originator

GS Technical Committee 23 on Instrumentation and Controls.

Business Risk

Not following the provisions of this Recommended Practice may result in malfunction of station equipment, causing a safety and/or gas reliability issue, and may delay resolving any control difficulty in a timely manner.

Contact for Further Information

█████████████ Senior Gas Engineer
SCADA & Controls, Station Engineering
Gas System Maintenance
Outside ███████████████████
LAN ID: ███████████

GTR0009165

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SUBJECT: Procedure for Revising, Documenting, and Filing Application Software for Microprocessor-Based Controls Equipment

Approvals and Authorizations

Don Anderson   *December 22, 1997*

Don Anderson, Manager, Gas System Technical Support   Date

███████████   *December 17,*

███████, Manager, Gas System Maintenance   Date

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Recommended Practice
Subject: Procedure for Revising, Documenting, and Filing
Application Software for Microprocessor-Based Controls
Equipment
Number: RP 4281   Effective Date: 1 Jan 1998
Revision: 1   Review Date: 1 Jan 2000

PROCEDURE FOR REVISING, DOCUMENTING, AND FILING OF APPLICATION SOFTWARE (PROGRAM) FOR MICROPROCESSOR-BASED CONTROL EQUIPMENT

1   RESPONSIBILITIES

1.1   The SCADA & Controls Section of GSM shall be responsible for revising the Application Software.

1.2   Changes to the Application Software may be made by the end users (district personnel, facility engineer, pipeline engineer, etc.) only in case of operational emergency. These changes shall be documented in accordance with Section 2.2 of this procedure.

1.3   For a non-emergency software revision, the end user (district personnel, facility engineer, etc.) is responsible for submitting a Revision Request (see Exhibit A) to the SCADA & Controls Section of GSM in accordance with Section 2 of this procedure.

1.4   Changes to the micro-processor device's field accessible parameters (e.g., alarm limits, tuning parameters, etc.) may be made by the end user. These changes shall be documented and the parameter values sent to the SCADA & Controls Section of GSM for record keeping.

2   PROCEDURE

2.1   REVISIONS MADE BY THE SCADA & CONTROLS SECTION

2.1.1   The Requester shall complete the "Application Software Revision Request" form, Exhibit A.

2.1.2   The "Application Software Revision Request" form shall include a description of the intent of the revision to the Application Software. The Requester may include a hard copy of the Application Software program code with the proposed changes marked in red.

2.1.3   The completed "Application Software Revision Request" form shall be sent to the responsible Facility or Pipeline Engineer for review. The Facility or Pipeline Engineer shall forward the Request to the SCADA & Controls Section following review.

2.1.4   The Request will be analyzed by the SCADA & Controls Section and the "Acknowledgment of Receipt" portion of the Request Form will be returned to the Requester with a cost estimate and an estimated completion date.

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2.1.5   Upon completion of the revisions and acceptance tests by the SCADA &
         Controls Section, copies of the new revision of the Application Software
         will be prepared and distributed as described in Section 3 of this
         procedure.

2.1.6   Questions and discrepancies that arise during the analysis will be
         discussed and resolved with the Requester and the Facilities or Pipeline
         Engineer prior to revising the Application Software.

2.2   REVISIONS MADE BY END USERS

2.2.1   Prior to making changes, ensure that the calendar and the clock of the
         computer used for revising the Application Software are current.

2.2.2   Prepare a copy of the current revision of the Application Software
         following the naming conventions described in Section 2.3 of this
         Procedure.

2.2.3   Upon completion of the revision, submit the following items to the
         responsible Facility or Pipeline Engineer and the SCADA & Controls
         Section of GSM:

         2.2.3.1 A completed "Software Revision Request" form, Attachment A.
                  (Include a written description of the intent of the change. The
                  "Acknowledgment of Receipt" form will be returned to the
                  Requester.)

         2.2.3.2 A hard copy of the Application Software program code with
                  changes highlighted.

         2.2.3.3 Diskette(s) with the revised Application Software.

2.3   SOFTWARE NAMING CONVENTIONS

2.3.1   Each Application Software for each PLC, single loop controller, or any
         other hardware at each facility shall have a unique name associated with
         the hardware, the facility name, or both. The name shall be as descriptive
         as possible within the limitations of the hardware and software used. The
         following are examples of the file or folder names for some of the
         facilities:

         2.3.1.1 Delevan Compressor Station, Station PLC 1, GE Series 6:
                  DL_PLC1

         2.3.1.2 Bethany Compressor Station, Unit PLC 2, GE Series 90-70:
                  BT_UNT2

         2.3.1.3 Hinkley Compressor Station, Station Controls, GE PCM Module:
                  HK_PCM

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2.3.2   Prior to making software or program modifications, a "fall-back" copy of the current version of the Application Software shall be made. The "fall-back" copy shall have a unique name associated with the facility and the date on which the software is to be modified. For instance, if PLC 1 software for Delevan Compressor Station is to be modified on June 10, 1997, the current version of the software DL_PLC1 shall be copied to a file named DL061097 prior to making changes. After preparing a "fall-back" copy, modifications can be made to the file DL_PLC1.

2.3.3   The first line of annotations of the modified program must contain: 1) the name of a person making modifications, 2) the date on which the modifications have been made, and 3) a detailed description of the modifications.

3   SOFTWARE DISTRIBUTION

3.1   The following personnel shall keep a separate set of floppy disks with the back-up copies of all Application Software for their respective facilities:

3.1.1   Facility Technician

3.1.2   District Foreman or Operating Supervisor

3.1.3   Responsible Facility or Pipeline Engineer

3.1.4   SCADA & Controls Section of the GSM (for all California Gas Transmission facilities)

3.2   Two versions of the Application Software shall be maintained by all back-up copy holders:

3.2.1   The current version (the revision used by the control system presently)

3.2.2   The "fall-back" version (the revision used by the control system prior to the latest modification)

3.3   Distribution of disks will be made by the SCADA & Controls Section of the GSM in accordance with Section 3.1 above.

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PG&E GAS SYSTEM MAINTENANCE DEPARTMENT

APPLICATION SOFTWARE REVISION REQUEST FORM

<u>Note</u>: This form shall be used when requesting changes to the Application Software for electronic microprocessor-based devices, such as programmable logic controllers, flow computers, operator interface terminals, etc., owned and operated by GSM. (Refer to Recommended Practice RP 4281).

To: **GSM, Station Engn.**   From: _____

SCADA & Controls   Company phone: _____

375 N. Wiget Lane   Outside phone: _____

Walnut Creek, CA

94598

Facility / Pipeline Engineer: _____

Company phone: _____

Outside phone: _____

Date:

Changes Requested: _____
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_____

(Use additional sheets if necessary. Indicate the number of additional sheets ___)

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If changes have been made by field personnel, please, provide the following information:

Enclosed is: _____ Hard Copy _____ 3.5" disk

Device(s) (i.e. Series 6 PLC, Moore Controller, Daniel Flow Computer, PCM module, etc.):

_____

Program Name: _____

Description of Changes: _____

_____

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_____

_____

(Use additional sheets if necessary. Indicate the number of additional sheets __)

Date changes made: _____

Changes made by: _____

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Facilities / Pipeline Engr Approval: _____ Date: _____

Request Received by: _____ Date: _____

Estimate Cost of Completion: _____ Est. Completion Date: _____

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