CENTERIOR ENERGY

PERRY NUCLEAR POWER PLANT
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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
ERDS Implementation Program Plan
Pursuant to 10CFR50, Appendix E

Gentlemen:

This letter satisfies the requirement to submit an implementation program plan for linking the Perry Nuclear Power Plant (PNPP) Unit 1, to the NRC's Emergency Response Data System (ERDS) pursuant to 10CFR50 Appendix E, Section VI.4.a. Perry's ERDS Implementation Plan is contained in Attachment 1. Attachment 2 contains the completed questionnaire from NUREG-1394, Rev. 1, for the Perry Plant.

Preliminary review indicates that the Perry Nuclear Power Plant can provide the majority of the requested parameters, with the exceptions of Drywell/Containment Oxygen Concentration (by design, Perry's containment is not inerted) and Intermediate Range Nuclear Instruments. However, the data is distributed on two computer systems which would be heavily utilized during Emergency Events. A satisfactory solution will require hardware modifications which have been factored into the implementation plan.

In addition, we have factored Perry's 1992 Refuel Outage into the schedule, as well as allotted time for modifying the Emergency Response Instructions and Software Control Procedures, and for training Emergency Response personnel prior to final implementation of ERDS at Perry. Nevertheless, adherence to the proposed ERDS Implementation Plan schedule contained in Attachment 1 is necessarily dependent on the NRC staff and its ERDS contractor with respect to timely review and approval of Perry's Data Point Library (DPL) and Plant Attribute Library (P , once submitted, and timely completion of ERDS acceptance testing.

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Our point of contact for ERDS, as provided in Attachment 2, is Mr. Keith J. Nelson. Mr. Nelson can be reached by telephone at (216) 259-3737 extension 5687. If you have any questions, please feel free to call.

Sincerely,

Michael D. Lyster

MDL:CJF:sc

Attachment

cc: NRC Project Manager
NRC Resident Inspector Office
NRC Region III
C. E. Norelius, NRC Region III

PERRY NUCLEAR POWER PLANT UNIT 1

ERDS IMPLEMENTATION SCHEDULE

Milestone Completion Date	Milestone Description
November 15, 1991	Engineering Design Change Request (EDCR) for hardware modifications submitted to Perry Nuclear Engineering Department for review and approval.
December 15, 1991	Data Point Library (DPL) and Plant Attribute Library (PAL) submitted to NRC and to NRC contractor.
April 1, 1992	Design Change Package (DCP) completed (hardware modifications installed).
September 30, 1992	Utility and NRC contractor software ready for testing.
October 15, 1992	Preliminary transmission testing.
October 30, 1992	Emergency Response Instruction changes and Software Control Procedure changes submitted for project review and approval.
November 30, 1992	Final test.
December 15, 1992	Procedure changes and Emergency personnel training complete and ERDS ON-LINE.

SC/CODED/3181

APPENDIX B

ERDS COMMUNICATIONS DESCRIPTION AND SURVEY QUESTIONNAIRE

The following is a questionnaire pertaining to the Nuclear Regulatory Commission's (NRC) Emergency Response Data System (ERDS). It consists of a series of questions concerning plant I/0 points, software protocols, data formats, transmission frequencies, and other plant computer specific information to be used in the ERDS computer database files. Also, included here are descriptions and examples of data streams that the NRC is expecting to see transmitted over the communication line.

The purpose of collecting the data is to develop a plant-specific database that will be retrieved into the ERDS once the system is activated by a utility. It will also be used to design and implement ERDS software that can receive the utility's data transmission. In essence, this information will provide the basis for building a profile of the plant in the ERDS database.

In some cases, the I/0 point data may be distributed over several computers. The ERDS considers this situation a multi-feeder site and Section IV must be filled out for each feeder.

I. Contacts

Note: Please provide name, title, mailing address, and phone number.

A. Survey Coordinator (i.e., contact for later clarification of questionnaire answers):

Keith J. Nelson (216) 259-3737 ext. 5697
Computer Engineer
Mail Stop SBB30
P.O. Box 97
Perry, Ohio 44081

B. Computer Hardware Specialist(s):

Clint Weirich (216) 259-3737 ext. 5263
Computer Engineer
Mail Stop SBB30
P.O. Box 97
Perry, Ohio 44081

C. Systems Software Specialist(s):

Keith J. Nelson

D. Application-level Software Specialist(s):

Keith J. Nelson

E. Telephone Systems Specialist(s):

Sharon Fleming (216) 259-3737 ext. 5553
Telecommunications Asst.
Mail Stop S210
P.O. Box 97
Perry, Ohio 44081

II. ERDS Communications Description

A. Hardware

The following hardware will be supplied:

- for a single-feeder site:

  Codex 2234 modem - V.22 2400 bps, asynchronous, auto-dialing, auto-answer, error-correcting, using the AT command set

- for a multiple-feeder site:

  Codex 6015 multiplexer,
  Codex 2260 modem - V.32 9600 bps, asynchronous, auto-dialing, auto-answer, error-correcting, using the AT command set

The modems are intended to be operated in the auto-reliable link mode (referred to as MNP in the modem manuals) with speed conversion and flow control enabled. Speed conversion allows the computer to communicate with the modem at a baud rate which is independent of the baud rate the modem is using to communicate with the remote modem. This feature is important because the modems have the ability to adjust their transmission rate downward if the remote modem is operating at a lower speed. However, in order to use speed conversion, the site computer must support some form of flow control. Three types of flow control are supported by the modems: XON/XOFF, RTS/CTS, and DTR/CTS. All of the above features are discussed in the modem manuals.

B. Software

1. Data Transmission

All transmissions, from both the site and the ERDS, will be terminated with a carriage return (<CR>).

a. Site will initiate a link request in ASCII using:

- the three-character site designator,
- the word LINK,
- local site time and date in the format MM/DD/YY/HH:MM:SS, and
- a <CR>.

If the site does not receive a response from the ERDS within one minute, it should send another link request message and continue sending them at one-minute intervals. If more than five minutes elapses without a response, site personnel should notify the NRC before disconnecting the line.

b. ERDS will respond in ASCII with:

- the three-character site designator,
- the word ACCEPTED or DENIED, and
- a <CR>.

If the ERDS responds with the denied message, the site should wait one minute and then send a link request message and continue sending them at one-minute intervals. If

more than five minutes elapses without a response, site personnel should notify the NRC before disconnecting the line.

c. When the ERDS is ready to receive data, it will send an initiate message in ASCII using:

- the three-character site designator,
- the word INITIATE, and
- a <CR>.

If the ERDS does not send an initiate message within one minute of the accept message, the site should send the link request message (described in Section II.B.1.a.).

d. Upon receipt of the initiate message, the plant begins transmission of data at a 15-second rate. The data string consists of:

- a header containing the three-character site designator and date and time in the format MM/DD/YY/HH:MM:SS,
- the data packet sequenced with point identifier, value, and quality tag,
- a trailer containing the checksum value of the data packet, and a <CR>.

e. When the site or ERDS wishes to terminate the connection, an ASCII message will be sent containing:

- the three-character site designator,
- the word TERMINATE, and
- a <CR>.

f. If a site is inadvertently terminated (due to loss of communications or receipt of terminate message) and the incident is still underway, the site should reconnect with the ERDS by redialing and using the reconnect link request message. This message is in ASCII and will contain:

- the three-character site designator,
- the word RECONNECT,
- local site time and date in the format MM/DD/YY/HH:MM:SS, and
- a <CR>.

Upon receipt of this message, the ERDS will respond with the accept and initiate messages as described in Sections II.B.1.b and II.B.1.c. If the ERDS responds with a link deny message (described in Section II.B.1.b), the site should stop trying to reconnect and send a link request message (described in Section II.B.1.a). If the ERDS does not respond to the site's reconnect request within one minute, the site should send another reconnect request and continue sending reconnect requests once a minute. If more than five minutes elapses without a response, site personnel should notify the NRC before disconnecting the line. It is the responsibility of the site to monitor the outgoing line for loss of communications.

2. Data Format

The following three delimiters have been identified:

(1) field delimiter (*),

(2) data set delimiter (\), and

(3) carriage return (<CR>).

Note: The length of the messages sent by the ERDS (e.g., ACCEPTED\, DENIED,* INITIATE, TERMINATE) are variable and it is recommended that the site software use the data set delimiter as the message delimiter for messages received from the ERDS.

a. Link requests will be in ASCII as described in II.B.1.a. with each field separated by a field delimiter and the request terminated with a data set delimiter. For example, PA1*LINK*01/12/89/11:48:50\<CR>.

b. The ERDS response will be in ASCII as described in II.B.1.b. with each field separated by a field delimiter and the response terminated with a data set delimiter. For example, PA1*ACCEPTED\<CR>.

c. When the ERDS is ready to receive data it will respond in ASCII as described in II.B.1.c with each field separated by a field delimiter and the response terminated with a data set delimiter. For example, PA1*INITIATE\<CR>.

d. Data streams will be in ASCII and will consist of three parts (header, data, and trailer) as described in II.B.1.d. with each field separated by a field delimiter and each of the three parts separated by a data set delimiter. For example,

Header: PA1*01/12/89/11:50:30\
Data: B21CP004*-0.1234E+00*3*.....(for each parameter)\
Trailer: 0000056000\<CR>

e. The point identifier may be up to 12 characters in length.

f. The value may be up to 20 characters in length.

g. The following quality tags will be accepted by the ERDS:

Good	= 0	Value is within range tolerance for discreet points or input points are within tolerance for composed points.
Off-scan	= 1	Point is currently out-of-service.
Suspect	= 2	Value is not bad yet should not be considered good. This quality will occur primarily on composed values when enough good inputs are present to allow the calculation to be made yet a bad quality on other inputs may make the result questionable.
Bad	= 3	Value is not within tolerance for discreet points or calculation of a composed point may not be made due to the qualities of its inputs.

Unknown	= 4	No quality indicator available.
Operator Entered	= 5	Value has been manually entered, overriding the discreet or composed value.
High Alarm	= 6	Value is in high alarm.
Low Alarm	= 7	Value is in low alarm.

h. The checksum which accompanies each update set will be an integer value calculated by summing each of the bytes of the transmission, up to and including the dataset delimiter following the body of the update set (the body of the update set being the portion containing the parameter, value, and quality indications). This integer checksum value will then be encoded into the update set as a 10-digit value, left-padded with zeros as required to fill the 10-digit field. The checksum is the sum of the transmitted bytes.

i. The reconnect link request message will be in ASCII as described in Section II.B.1.f with each field separated by a field delimiter and the request terminated with a data set delimiter. For example, PA1*RECONNECT*01/12/89/11:48:50\<CR>.

3. Protocol

a. ERDS will use XON/XOFF to stop, resume, or suspend data transmission for the site.

b. Communication parameters:

- eight data bits
- 1 stop bit
- parity = none

4. Exceptions

Please note any exceptions which must be taken to Section II and explain why.

ERDS data from Perry will be transmitted at a 60 second rate due to the current loading of the Computer Systems at Perry.

III. Selection Of Data Feeders

A. How many data feeders are there (six maximum)?

ONE

This data feeder will collect data from 2 plant computers and then transmit the plant data to the NRC via a modem.

B. Identify the selected data feeders and provide the following for each:

(1) a short description of the categories of data points it will provide (e.g., met, rad, or plant data points, by unit) and

(2) the rationale for selecting it if another system can also provide its categories of data points.

(1) All required points except Oxygen Concentration and Intermediate Range Nuclear Instruments.

(2) Only plant computer with sufficient CPU capacity to handle communication program.

C. Which data feeder is the site time determining feeder? This should be the feeder which is providing the majority of the data points.

ERIS (Emergency Response Information System) will provide the time stamp on plant data.

IV. Data Feeder Information

Note: A new Section IV must be filled out for each feeder system selected.

General Questions

1. **Identification of Data Feeder**

   a. What is the name in local parlance given to this data feeder (e.g., Emergency Response Information System)? Please give both the acronym and the words forming it.

      Aladin

   b. Is this the site time determining feeder?

      No

   c. What is the update frequency of this feeder (in seconds)?

      Data will be updated every 60 seconds.

2. **Hardware/Software Environment**

   a. Identify the manufacturer and model number of the data feeder hardware.

      VAX 11/780

   b. Identify the operating system.

      VMS 4.4

   c. What method of timekeeping is implemented on this feeder system (Daylight Savings, Standard, Greenwich)?

      Daylight Savings

   d. In what time zone is this feeder located?

      Eastern

3. Data Communication Details

a. Can this data feeder provide asynchronous serial data communication (RS-232-C) with full-modem control?

Yes

b. Will this feeder transmit in ASCII or EBCDIC?

ASCII

c. Can this feeder transmit at a serial baud rate of 2400 bps? If not, at what baud rate can it transmit?

Yes

d. Does the operating system support XON/XOFF flow control?

Yes

1. Are any problems foreseen with the NRC using XON/XOFF to control the transmission of data?

No

e. If it is not feasible to reconfigure a serial port for the ERDS linkup (i.e., change the baud rate, parity, etc.), please explain why.

N/A

f. Can the serial port dedicated to the ERDS be configured so that the NRC need not emulate a specific brand of terminal (i.e., can it be configured to be a "vanilla" terminal)?

Yes

g. Do any ports currently exist for the ERDS linkup?

Yes

1. If not, is it possible to add additional ports?

N/A

2. If yes, will the port be used solely by the ERDS or shared with other non-emergency-time users? Give details.

Only for ERDS.

4. Data Feeder Physical Environment and Management

a. Where is the data feeder located in terms of the TSC, EOF, and control room?

TSC

b. the data feeder protected from loss of supply of electricity?

Yes

c. Is there a human operator for this d a feeder?

Yes

1. If so, how many hours a day is the feeder attended?

Mon - Fri 10 hrs/day (7:00 - 17:30)