

ILLINOIS POWER COMPANY



CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

July 21, 1986

Docket No. 50-461

Mr. James G. Keppler  
Regional Administrator, Region III  
U. S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Subject: Clinton Power Station (CPS)  
Emergency Response Data System  
Data Parameters and Protocol

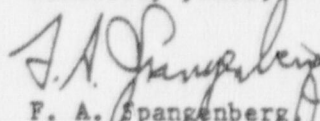
Dear Mr. Keppler:

The NRC's intent to establish emergency communications capability with CPS is documented in the NRC letter dated April 25, 1986. This capability, known as the Emergency Response Data System (ERDS), provides for the transmission of key plant parameters via computer communications link.

Illinois Power is in the process of evaluating the ERDS requirements for CPS. The purpose of this letter is to provide to the NRC Staff a preliminary list of plant data and communications protocol for the CPS Emergency Response Data System as determined from this evaluation to date. Attachment 1 contains the CPS computer data list for ERDS. Attachment 2 describes the CPS protocol for data transmission. Attachment 3 describes the format of the transmitted ERDS system. A final description of the CPS Emergency Response Data System will be provided to you following the NRC Staff's visit to CPS, per your April 25, 1986, letter.

If I can be of further assistance to you in this matter, please notify me.

Sincerely yours,

  
F. A. Spangenberg  
Manager - Licensing  
and Safety

TLR/pjr

8712230064 871210  
PDR FOIA  
SHOLLYB7-737 PDR

Attachment

cc: Mr. B. L. Siegel, NRC Clinton Licensing Project Manager  
NRC Resident Office  
Illinois Department of Nuclear Safety

~~Mr. B. L. Siegel, NRC Resident Office~~

JUL 23 1986

ATTACHMENT 1  
 CLINTON POWER STATION  
 ERDS DATA DESCRIPTION

<u>Parameter</u>	<u>Computer Point</u>
Reactor Pressure	RP-DA201 RP-DA202
Reactor Water Level	B21DA002 NB-DA401 NB-DA402 NB-DA403
Feedwater Flow (core flow)	B33-NA001
Neutron Flux-Startup Range (Source Range Monitors)	C51DA001 C51DA002 C51DA003 C51DA004
Reactor Coolant Isolation Cooling (RCIC) Flow	E51DA001
High Pressure Core Injection (HPCI) Flow	(Not applicable)
Core Spray Flow-High Pressure (HPCS)	HP-DA301
Core Spray Flow-Low Pressure (LPCS)	LP-DA301
Low Pressure Coolant Injection (LPCI) Flow	E12DA001 E12DA002 RH-DA301
Condensate Storage Tank Level	CY-BA401
Drywell Pressure	B21-DA008 B21-DA009
Drywell Temperature	CM-BA007 CM-BA008
Hydrogen & Oxygen Concentration	CM-BA901 ]-H <sub>2</sub> CM-BA902 ]  CM-BA903 ]-O <sub>2</sub> CM-BA904 ]
Drywell Sump Level	RF-BA301 Floor drain sump flow RE-BA301 Equip drain sump flow
Suppression Pool Temperature	CM-BA001 CM-BA002 CM-BA003 CM-BA004
Suppression Pool Level	SM-BA401 SM-BA402 SM-BA403 SM-BA404

Reactor Coolant Radioactivity Level (Not available in Plant  
Process Computer)

Primary Containment Radiation Level CM-BA905 ]- Drywell  
CM-BA906 ]- Containment  
CM-BA907 ]- Containment  
CM-BA908 ]- Containment

Process Radiation Monitors to be Supplied

Heating, Ventilating and Air Conditioning (HVAC) Flow Rate  
HVAC Noble Gas  
HVAC Iodine  
HVAC Beta  
Standby Gas Treatment System (SGTS) Flow Rate  
SGTS Noble Gas  
SGTS Iodine  
SGTS Beta  
Liquid Rad Waste Flow Rate  
Liquid Rad Waste Effluent, Gamma  
Plant Service Water Flow Rate  
Plant Service Water Effluent, Gamma

Meteorological Data to be Supplied

Wind Speed at 10 Meter and 60 Meter heights  
Wind Direction at 10 Meter and 60 Meter heights  
Temperature at 10 Meter and 60 Meter heights  
Dewpoint at 10 Meter height



ATTACHMENT 2  
CLINTON POWER STATION  
ERDS TRANSMISSION PROTOCOL

Communications Protocol

ASCII Asynchronous, 8 bit, no parity, 1 start bit, 1 stop bit  
1200 - 9600 Baud

Data Requisition

ERDS input would be obtained from the Plant Buffer Computer Data Link System, located in EOF and connected directly to Process Computer by Fiber Optical Data Link System.

Data Transmission

Commercial/or dedicated line

Data Collection

Data to be sent every 10 minutes on the 5 minute mark.

Control

Located in EOF building, system is up all the time, modem could be switched on when required and system transmission initiated.

Data Validation/Signal Processing

Analog Signals

- Hardware Checking
- Offset Correction
- Gain Compensation
- Digital Filtering
- Reasonableness Limit Check
- Data Compression
- Calibration Correction
- Drift Testing
- Conversion to Engineering Units

Digital Signals

- Input Status Change
- Group Failure
- Change of State

Radiation Monitors

Ten of the Radiation monitor signals have back-up signals that can be transmitted.

ATTACHMENT 3  
CLINTON POWER STATION  
ERDS DATA FORMAT

Each message will consist of the following 4 groups of information, in the order specified:

a. 16 characters of header information:

1 start of header character '/'  
2 station identification characters 'CP'  
1 reactor number character '1'  
1 decimal point character '.'  
6 date characters (YYMMDD)  
1 decimal point character '.'  
4 24-hour clock time characters (HHMM)

Example: Header for Clinton 1 on June 1, 1986 at 0410  
hours: /CP1.860601.0410

b. a fixed number of analog point data strings, in a prespecified order (not necessarily alphabetical). Each string will contain 22 characters, as follows:

8 point ID characters forming a unique string  
10 point value characters (+9.000E+99)  
4 point status characters (bitmapped -- see below)

Example: Analog point RX-PR008 at a value of +925,000 with normal status: RX-PR008+9.250E+050000

c. a fixed number of digital point data strings, in a prespecified order (not necessarily alphabetical). Each string will contain 12 characters, as follows:

8 point ID characters forming a unique string  
4 point status characters (bitmapped -- see below)

Example: Digital point RC-BC801 in alarm, open contact: RC-BC8010001

d. 1 character of trailer information:

1 End of Message character '\'

All analog and digital points sent from Clinton Power Station's process computer will include 2 bytes of status information. No status information can be sent for those points originating from the Eberline system. The status bytes will consist of 16 bits, numbered 0 through 15 from right to left.

The meanings of the process computer analog status bits are as follows:

<u>Bit</u>	<u>Meaning (if bit set)</u>
0	Point in alarm
1	Analog-to-digital conversion overflow
2	Open thermocouple
3	Sensor low limit exceeded
4	Sensor high limit exceeded
5	Scanner failure
6	Significant alarm
7	-- Not used --
8	Low variable limit calculation on
9	High variable limit calculation on
10	Substituted value (bit 14 will also be set)
11(*)	1: High limit exceeded; 0: Low limit exceeded
12	Direction of last point value change
13	Point alarm acknowledged
14	Point deleted from processing
15	Point bad

(\*) Has meaning only when bit 0 is set.

The meanings of the process computer digital status bits are as follows:

<u>Bit</u>	<u>Meaning (if bit set)</u>
0	Point in alarm
1	Value of digital point (1 = closed contact)
13	Point alarm acknowledged
14	Point deleted from processing



Cluster SPDS meeting

BWR6 / "Nucleart".

"Plant Summary Display" originally planned, was developed into the SPDS, using ~~more~~ <sup>planned</sup> CRT.

Also has a "Performance Monitoring System"

SPDS info is also available in TSC & EDF.

Availability = 95 → 98%

DCS utilizes 4 computers (Requires 2 computers to make full set of displays available) (Redundant trains)

Having trouble with data validation algorithms.

Major issue with NRC reviews.

\* No communication between ARM/PRM computers and DCS/PMS computers.

PMS and ARM/PRM both go to terminals in EDF & TSC.

SPDS come from DCS

Run off site terminals for SPDS.

TSC & EDF Terminals can call up any DCS display for the control room CRT's.

PARTICIPANTS

FACILITY:

DATE:

NAME	ORGANIZATION	PHONE
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A.K. LOPOSER	NRC/comex corp	206-692-1010



Clinton

Terry Riley (217) 935-8351 x 328

x 3409

Will get back to me.

Will meet @ EOF (inside fence)