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Director, Office of Nuclear Reactor Regulation
Attention: G. E. Lear, Director
PWR Project Directorate No. 1
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket 50-206
Generic Letter 83-28 Item 1.2 - Data and Information Capabilities
San Onofre Nuclear Generating Station
Unit 1

Reference: September 3, 1985 letter from J. A. Zwolinski, NRC, to K. P.
Baskin, SCE, regarding Generic Letter 83-28

Subsequent to NRC issuance of the referenced letter, discussions between SCE and NRC staff reviewers identified the need for additional information relating to the Post-Trip Review Data and Information Capabilities at San Onofre Unit 1. The specific information needed to complete the NRC review of this issue included a marked-up Events Recorder strip chart indicating time discriminations, the sampling frequency of parameters included in the post-trip review function of the FOX-III computer, and a discussion of the recording capabilities for the desirable PWR post-trip review parameters as identified in the referenced letter.

To illustrate the time discriminations on the Events Recorder strip chart an actual strip chart was provided to you by our letter of January 21, 1986. Discussions with staff reviewers indicated the time discriminations for the transition from normal to high speed operation of the strip chart were not readily apparent. To more clearly illustrate this transition a simulated Events Recorder strip chart was prepared and is enclosed as Figure 1. A trip signal is assumed to occur on the four channels shown at 8:00 p.m. Subsequent to the trip, the events recorder enters a high speed mode of operation (3600 times normal speed) for 24 seconds. In doing so, the time discrimination on the chart changes. For illustration purposes the new time discriminations are shown in parentheses and the pen traces after the trip are dashed. Although not shown in Figure 1, the high speed operation will continue for 24 seconds (i.e., until 8:00 p.m. again appears on the strip chart). Figure 1 is provided to simply illustrate the transition from normal speed to high speed

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operation of the strip chart. The figure is not designed to provide actual time discrimination since the time scale has been reduced in order to put an entire 24 hour section of the chart on a single sheet of paper. A section of an actual events recorder strip chart is provided as Figure 2. From this figure it is apparent that the necessary time discriminations to conduct a post-trip review are available during high speed operation of the strip chart.

The referenced letter identified a concern associated with the sampling interval for parameters on the FOX-III computer. As stated in our initial response to Item 1.2 by our letter of November 28, 1983, the parameters and sampling rates for the FOX-III were selected consistent with our commitments regarding recording capability for Post-TMI Category B requirements. No specific sampling intervals were provided for the FOX-III parameters in the November 28, 1983 submittal. The following discussion is provided to clarify the term "sampling interval" with respect to the FOX-III.

Two distinct types of data sampling occur on the FOX-III and are defined as follows:

- 1) Scan Rate - the rate at which the central processing unit (CPU) reads the analog/digital field inputs and converts the raw data into engineering units. The FOX-III raw analog and digital inputs are scanned at the following rates:
 - a) Digital Inputs - once per second
 - b) Fast Analog Inputs - once per second
 - c) Analog Inputs - once per five seconds

Computational values (variables derived from one or more raw inputs, such as T_{SAT} , T_{HOT} , etc.) are scanned at frequencies varying from 5 to 60 seconds.

- 2) Historical Data Collection Rate - the rate at which the CPU stores field input values on a mass storage device. The FOX-III has two historical data collection rates - one minute interval and one second interval. Most analog inputs (including fast analog inputs) are recorded in the one minute interval history files. The FOX-III retains the one minute historical data for 24 hours. The FOX-III hard disk drive maintains 30 minutes (25 minutes pre-trip to 5 minutes post-trip) of fast analog inputs gathered at one second intervals. This file acts as a circular buffer that overwrites the oldest data as new data is received. The parameters included in this file are noted in Table 1.

In conclusion, the FOX-III has a one second data collection rate for critical plant parameters, and a one minute data collection rate for these parameters plus the remaining plant process parameters.

It is also noted that nine of the fourteen desirable PWR parameters recorded on the FOX-III are also recorded by the Events Recorder or a control room data recorder. These recorders sample data continuously. Of the remaining parameters that do not have redundant recording capability and are not part of the post-trip review function of the FOX-III, discussions with staff reviewers indicated RCS flow is the only parameter of concern. This parameter has no direct recording capability. However, loss of RCS flow is indirectly indicated on the events recorder by the RCS reduced power low flow scram and full power low flow scram channels. Indication of these trips on the events recorder will provide sufficient information concerning RCS flow in performing a post-trip review.

The remaining information requested by the staff reviewers consisted of an itemization of the recording capabilities for the desirable post-trip review parameters. This information is provided as Table 1. It is noted that although no direct recording capability exists for Diesel Generator Status the diesels are automatically started on a safety injection signal. Therefore, indication for purposes of post-trip review can be determined from safety injection initiation as recorded on the FOX-III and the Events Recorder.

If you have any questions or require additional information, please let me know.

Very truly yours,



Enclosures

TABLE 1
POST-TRIP REVIEW PARAMETERS

<u>Parameter/Signal</u>	<u>Events Recorder</u>	<u>Control Room Data Recorder</u>	<u>FOX-III</u>
Reactor Trip	X		X
Safety Injection	X		X
Containment Isolation			X
Turbine Trip	X		
Control Rod Position ⁽¹⁾			
Neutron Flux, Power	X	X	X(6)
Containment Pressure			X
Containment Radiation ⁽¹⁾			
Containment Sump Level			X(6)
RCS Pressure	X	X	X(6)
RCS Temperature		X	X(6)
Pressurizer Level	X	X	X(6)
Reactor Coolant Pump Status ⁽¹⁾			
RCS Flow ⁽²⁾			
Safety Injection Flow		X(3)	X
MSIV Position ⁽⁴⁾			
Steam Generator Pressure		X	X(6)
Steam Generator Level	X	X	X(6)
Feedwater Flow	X	X	
Steam Flow	X	X	
AFWS Flow			X(6)
AC and DC System Status ⁽¹⁾			
DG Status ⁽⁵⁾			
PORV Position			X

(1) Parameter not recorded.

(2) RCS Flow is not recorded directly. However, loss of RCS flow is indirectly indicated on the events recorder by the RCS reduced power low flow scram and full power low flow scram channels.

(3) SI Pump bearing temperature (provides indirect indication of pump status).

(4) Parameter not applicable to San Onofre Unit 1.

(5) DG status is not recorded directly. However, the DG's are automatically started during a safety injection actuation. SI initiation is recorded on the FOX-III and the events recorder.

(6) Parameter included in the Post-Trip Review function of the FOX-III.

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FIGURE 1
SIMULATED EVENTS RECORDER
STRIP CHART

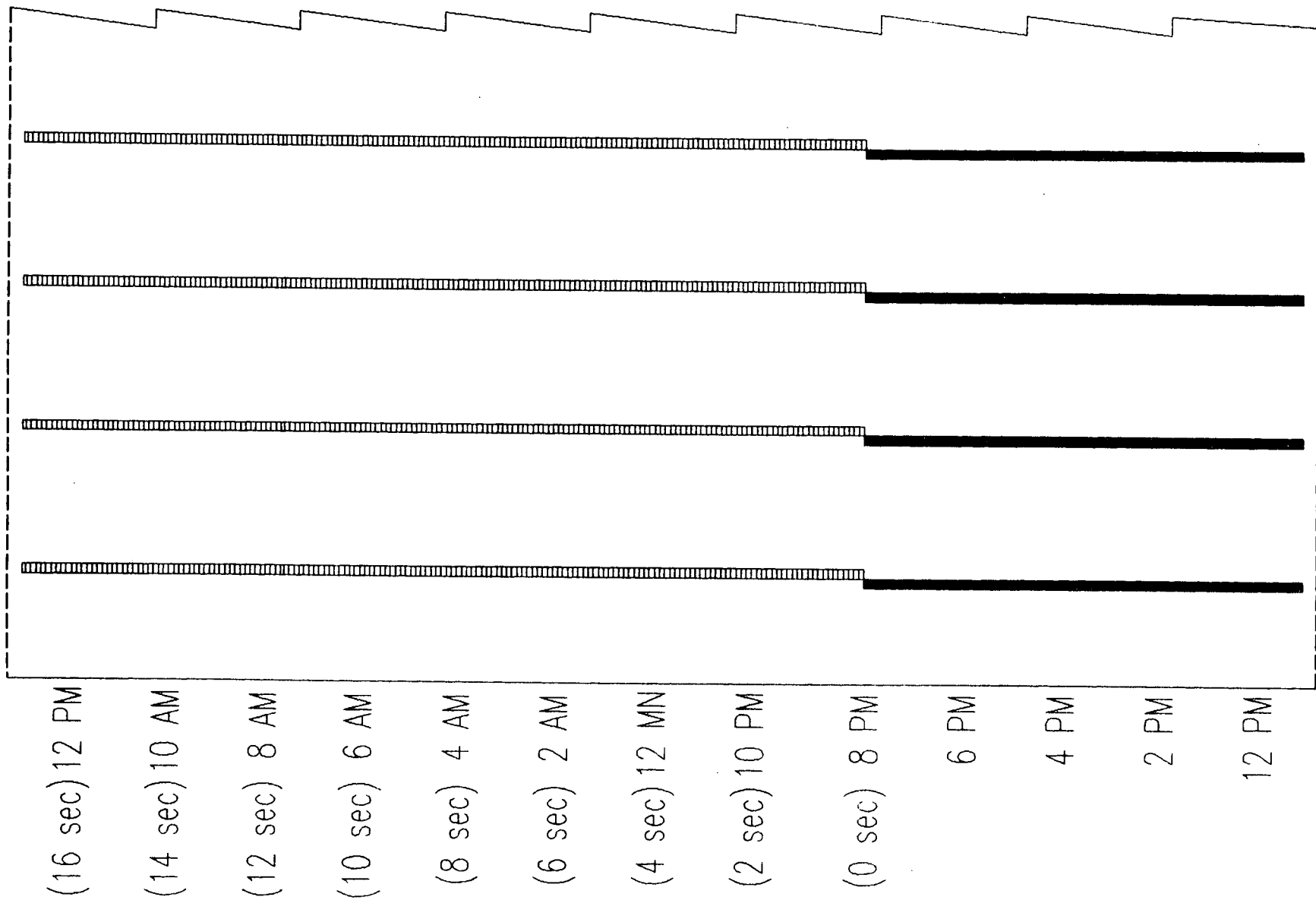
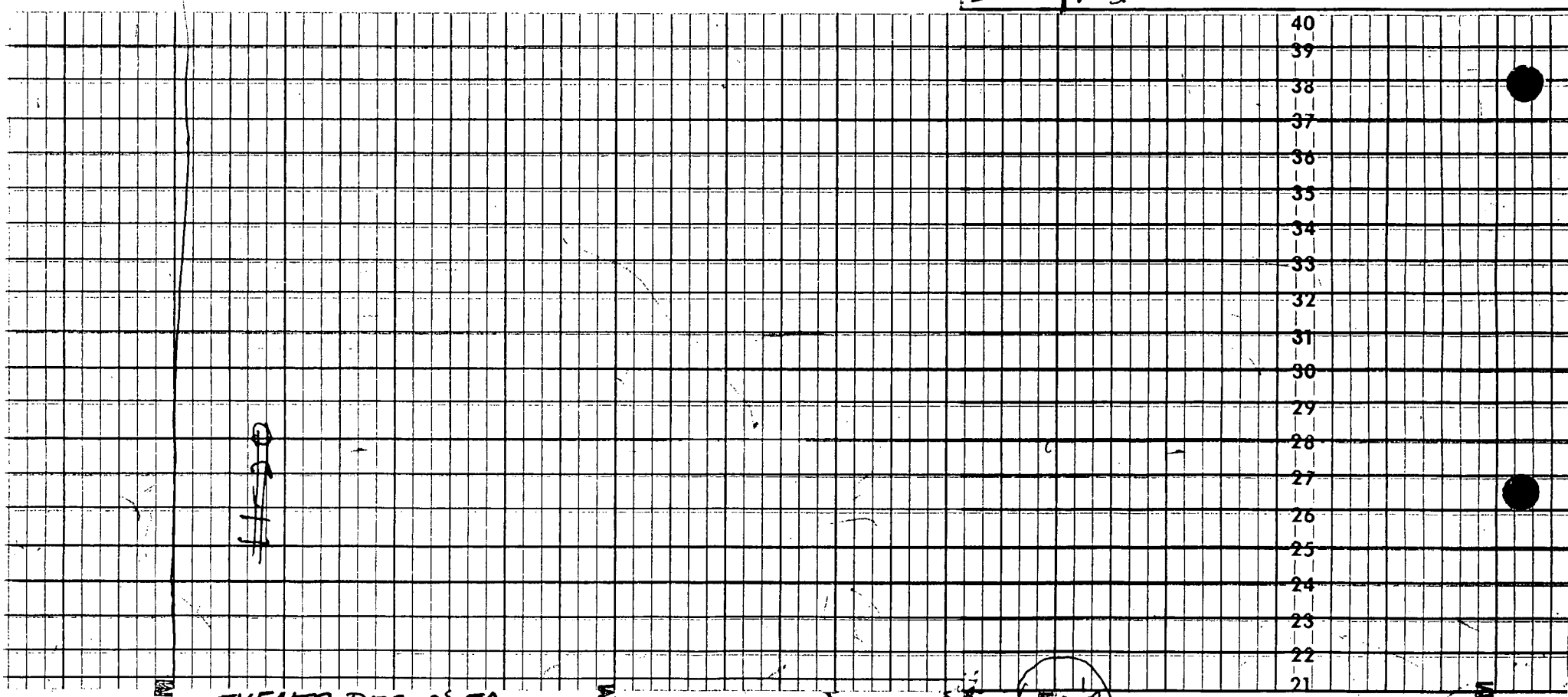


FIGURE 2
ACTUAL EVENTS RECORDER
STRIP CHART

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RECORDING CHARTS GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK

HIGH SPEED SHAFT



EVENTS RECORDER

4 AM
1/2/80

3/5

FIGURE 2 (continued)

83 FEET LEFT
SEAFLOW
BUFFALO, NEW YORK

PRINTED IN U.S.A.

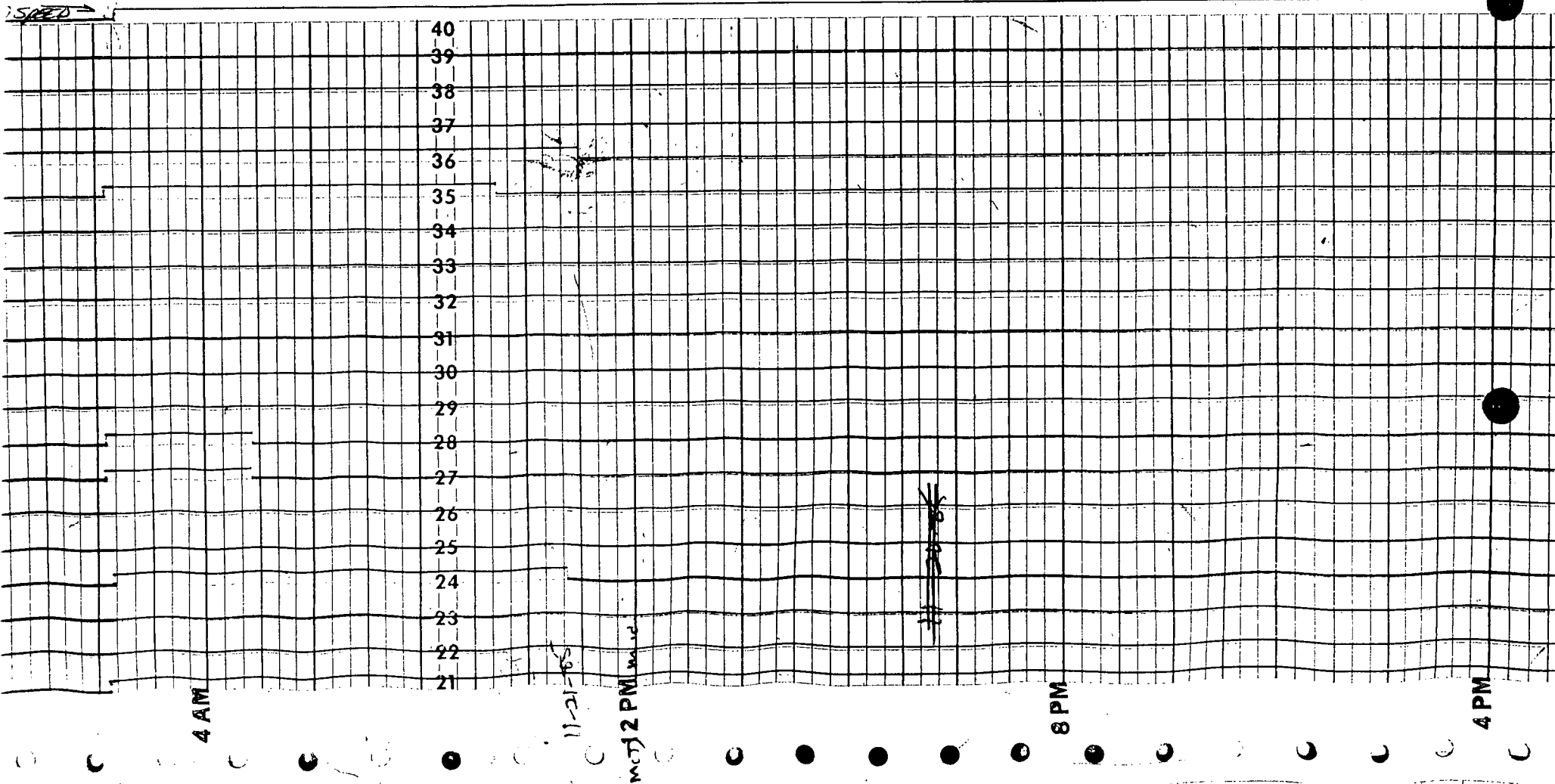


FIGURE 2 (continued)

No. 37040-A

RECORDING CHARTS GRAPHIC CONTROLS CO

