WOLF CREEK
NUCLEAR OPERATING CORPORATION

March 8, 1996
WO 96-0037

Otto L. Maynard
Vice President - Plant Operations

U. S. Nuclear Regulatory Commission
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Washington, D. C. 20555

Reference: 1) Letter CO 95-0010, dated July 29, 1994, from R. N. Johannes, WCNOC, to USNRC
2) Letter ET 95-0099, dated September 15, 1995, from R. C. Hagan, WCNOC, to USNRC

Subject: Docket No. 50-482: Response to Request for Additional Information Concerning the Revision to Technical Specification 3/4.8.1, "Electrical Power Systems - A.C. Sources"

Gentlemen:

This letter transmits additional information and revised technical specification pages previously provided in Reference 2 and requested during a telephone conference call on November 16, 1995 between Wolf Creek Nuclear Operating Corporation, Union Electric personnel and the NRC staff. The conclusions reached in the Safety Evaluation, No Significant Hazards Consideration Determination, and Environmental Impact Determination transmitted by Reference 2 are not affected by the changes in these revised pages

Attachment I responds to comments presented by the NRC. Attachment II provides revised Technical Specification pages.

If you have any questions concerning this matter, please contact me at (316) 364-8831, extension 4450, or Mr. Richard D. Flannigan, at extension 4500.

Very truly yours,

Otto L. Maynard

OLM/jra

Attachments

cc: G. W. Allen (KDHE), w/a
L. J. Callan (NRC), w/a
W. D. Johnson (NRC), w/a
J. F. Ringwald (NRC), w/a
J. C. Stone (NRC), w/a

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STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Otto L. Maynard, of lawful age, being first duly sworn upon oath says that he is Vice President Plant Operations of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Otto L. Maynard
Otto L. Maynard
Vice President
Plant Operations

SUBSCRIBED and sworn to before me this 7TH day of MARCH, 1996.

Mary E. Gifford
Notary Public

MARY E. GIFFORD
Notary Public - State of Kansas
My Appt. Expires 12/09/1999

Expiration Date 12/09/1999

Response to Request for Additional Information

The information in brackets [ ] is Technical Specification numbers/information specific to the Union Electric (UE) submittal.

NRC Comment 1: Proposed Technical Specification Bases 3/4.8 and 6.8g [6.8h] - Diesel Fuel Oil Testing Program. Wolf Creek Nuclear Operating Corporation (WCNOC) and UE should use "in accordance with" when referring to requirements in applicable ASTM standards.

Response: WCNOC and UE had proposed to delete the phrase "in accordance with" and replace it with "based on" to allow minor exceptions from a specific ASTM standard while still meeting the intent of the standard. These exceptions are sometimes necessary due to the impracticality of a test or due to an ASTM standard not being specifically meant for diesel fuel oil. In a telephone conference call with the NRC on June 16, 1995 it was agreed that these exceptions should be listed in the Bases. Since these exceptions will be listed in the Bases and are not required to be changed via a license amendment, acceptable flexibility is provided. Therefore, the wording in proposed Technical Specification Bases 3/4.8 and 6.8g[6.8h] have been revised to use the phrase "in accordance with."

NRC Comment 2. The new Administrative Controls Sections 6.5.1.6.i [6.5.1.6.q] and 6.5.2.8.m [6.5.2.8.l], which were submitted by Reference 2, refer to Standard Technical Specifications Sections 5.5.1.2 and 5.5.2.3 respectively, but these sections are not in, NUREG-1431, Revision 1, "Westinghouse Standard Technical Specifications."

Response: Item i [Item q] was being proposed to be added to Technical Specification 6.5.1.6 to require that the Plant Safety Review Committee [On-site Review Committee] be responsible for the review of the Diesel Fuel Oil Testing Program. This proposed change was consistent with Section 5.5.1.2 of NUREG-1431, Revision 0, "Westinghouse Standard Technical Specifications."

A new item m [item l] was proposed to be added to Technical Specification 6.5.2.8 to require audits of the Diesel Fuel Oil Testing Program be performed under the cognizance of the Nuclear Safety Review Committee [Nuclear Safety Review Board]. This proposed change was consistent with Section 5.5.2.3 of NUREG-1431, Revision 0.

In a telephone conference call with the NRC on June 16, 1995 it was recommended that WCNOC and UE follow what had been submitted and approved for the Florida Power and Light, Turkey Point Units (letter dated October 20, 1994). The above changes were consistent with what had been approved for Florida Power and Light. WCNOC and UE have reviewed NUREG-1431, Revision 1 and concur with the NRC that these requirements are not in Revision 1 of the Standard Technical Specifications. Based on this information and the latest discussions with the NRC Staff, WCNOC and UE have revised

these pages to delete 6.5.1.6.i [6.5.1.6.q] and 6.5.2.8m [6.5.2.8l].

NRC Comment 3. Provide additional justification for removal of Surveillance Requirement 4.8.1.1.2g.2, single-load rejection test, from Technical Specifications.

Response: Provided below is additional justification to support deletion of the single-load rejection test. This justification takes into account diesel generator responses to previously performed full-load rejection and single-load rejection tests as well as plant events that have occurred during this testing. The single-load rejection test is an insignificant transient compared to the other transient tests being performed and is a duplication of the testing of the generator and engine capabilities to handle a transient.

- **Enveloping the Single-Load Rejection Test**

A. The single-load rejection test is enveloped by the full load rejection test since the proposed change revises the frequency criteria to 60 ± 5.4 Hertz which is the current frequency for the single largest load rejection test. Figure 1 provides a strip chart recording for the Callaway Plant for a typical full-load rejection test. Figure 2 provides a recording for Wolf Creek Generating Station (WCGS) of a typical full-load rejection test.

B. The single-load rejection test is enveloped since the initial diesel generator loading sequencing produces a voltage and frequency swing much larger than that caused by rejection of the single largest load. This is because the locked rotor currents and torque changes of the starting motor have a larger effect than that of the same motor being rejected. The diesel generator returning to steady state values, indicates that the governor is working to handle load changes both positive and negative (frequency swings) and the voltage regulator is handling both positive and negative changes (voltage swings). When the largest load is sequenced onto the diesel generator with the majority of the other loads already sequenced on, the governor, the engine, and the regulator/exciter are tested and sufficient margin is shown to handle a transient at least equivalent to the loss of the single largest load, if recovery to steady state values occur.

The voltage and frequency swings for the single-load rejection test at WCGS and Callaway Plant stay within steady state values at all times in the transient. The voltage and frequency swings that occur during the load sequencing are much greater than the swings during the rejection and indicate that the connected loads can handle the transient of the single-load rejection. Figure 3 provides a strip chart recording for the Callaway Plant that is typical of the "Blackout Load Sequencing the ESW Pump Load Rejection Tests." It indicates that the sequencing load transients are of a much greater magnitude than the Essential Service Water (ESW) pump load rejection. The voltage and frequency swings shown on page 4 of Figure 3 for the ESW pump start, show a minimum of 3323 Vac to a maximum of 4600 Vac for the voltage transient and a minimum of 58.2 Hertz to a maximum of 61.1 Hertz for the frequency transient. The

duration of the transient to steady state was 1.7 seconds for the voltage transient and 3.0 seconds for the frequency transient. The ESW pump rejection shown on page 7 of Figure 3 indicates no minimum voltage transient and a rise from the steady state voltage of 4155 Vac to a maximum of 4234 Vac with a duration of 0.2 seconds. The frequency transient shows no minimum frequency transient and a rise from the steady state frequency of 60.2 Hertz to a maximum of 60.6 Hertz with a duration of 1.1 seconds. Figure 4 provides a recording of voltage and frequency during a typical single-load rejection test (pump trip followed by a pump start). During the single-load rejection test, initial voltage was established at 3990 Vac and frequency was 60 Hertz. When the ESW pump was tripped, the maximum transient voltage was 4042 Vac (52 Vac swing) and the maximum frequency was 60.4 Hertz (0.4 Hertz swing). The transient caused by starting the pump was much greater. Voltage ranged from 3307 Vac to 4357 Vac (1050 Vac swing). Frequency ranged from 58.7 to 60.7 (2 Hertz swing). This demonstrates that the single-load rejection test is not significant to demonstrating operability of the diesel generator.

The voltage regulator action is based on error from the desired voltage setting and the error signal is given a gain. This action is the same in both positive and negative directions and there are no dead bands in this process.

- **Performance of the Single-Load Rejection Test Represents Potential Risk to Other Safety Related Systems.**

The ESW pump provides cooling water for the diesel generator. The pump must successfully be restarted within five minutes after shutdown or the emergency diesel generator must be shutdown. Stopping and restarting the ESW pump can produce water hammer events which are undesirable occurrences and can cause damage to the system. These water hammer events are caused by the system producing vacuum areas at high points and the partial draindown of the system when the pump is stopped.

NRC Inspection Reports 50-483/9209, 50-482/9131, and 50-482/9136 provide documented concerns about water hammer events that have occurred at the Callaway Plant and WCGS. NRC Information Notice 92-81 documents the NRC's concerns associated with industry water hammer events. And at least five water hammer events have occurred on the ESW System at Callaway Plant and are documented on internal corrective action documents.

- **Rejection of a Combination of Other Loads Equivalent to the Single Largest Load.**

It would not be feasible to use a combination of other loads equivalent to the ESW pump as a replacement for the single-load rejection test. The ability to reject these loads simultaneously from the diesel generator and to produce any meaningful data currently does not exist at WCGS or Callaway Plant. In order to perform this test using equivalent loads, plant system modifications would have to be made to be able to simultaneously reject these loads such that the data obtained would represent a meaningful test. These modifications could introduce failure mechanisms into the affected systems that would otherwise not have been there, thus impacting the ability of these systems to perform their intended safety functions.

NRC Comment 4. Surveillance Requirement 4.8.1.1.2g.8 [4.8.1.2f.8] - verification that auto connected loads do not exceed 6201 kW. The NRC Staff requested additional information as to if this surveillance was being deleted or relocated to another document. Additionally, the staff requested information concerning how this surveillance was performed.

Response: WCNOC and UE requested Surveillance Requirement 4.8.1.1.2g.8 [4.8.1.2f.8] be eliminated from technical specifications. Based on a telephone conversation with the NRC the surveillance requirement will be relocated to Chapter 16 of the Updated Safety Analysis Report [Final Safety Analysis Report] and evaluated in accordance with 10 CFR 50.59.

Total diesel generator kW load is determined using surveillance procedures STS KJ-001A [ISP-SA-2413A], "Integrated D/G And Safeguards Actuations Test Train A," and STS KJ-001B [ISP-SA-2413B], "Integrated D/G And Safeguards Actuations Test Train B." The requirements of these procedures take into account indicated amp load, indicated voltage, and power factor. These procedures require that the kW load must be $\leq$ 6201 kW. The results of these tests are trended consistent with the Emergency Diesel Generator Reliability Program.

NRC Comment 5. Surveillance Requirement 4.8.1.1.2h [4.8.1.1.2g] - simultaneous starting of both diesel generators after any modification which could affect diesel generator interdependence. The NRC Staff requested a discussion of how the modification process detects and tracks concerns relating to the interdependence of the diesel generators.

Response: WCNOC and UE had proposed to revise surveillance requirement 4.8.1.1.2h [4.8.1.1.2g] to eliminate the performance of this surveillance requirement after any modifications which could affect emergency diesel generator interdependence. WCNOC and UE are withdrawing the proposed change as it will be addressed as part of the conversion to the Improved Standard Technical Specification.

NRC Comment 6: Technical Specification 4.8.1.1.2g.7 (proposed 4.8.1.1.2g.6) [4.8.1.1.2f.7] - 2 hour overload test. The Technical Specifications should still require the diesel generator to operate for greater than 2 hours in an overloaded condition with a footnote indicating that this portion of the surveillance need not be performed provided the auto-connected loads remain below the 6201 kW continuous rating of the diesel generator.

Response: Proposed Technical Specification 4.8.1.1.2g.6 has been revised to verify the diesel generator operates for greater than or equal to 2 hours loaded to an indicated 6600 to 6821 kW if auto-connected loads increase above 6201 kW. Additionally, WCNOC and UE have retained the existing footnote to provide guidance to avoid routine overloading of the engine.

STS KJ-0014
SMF 5.3.13
10/16/94

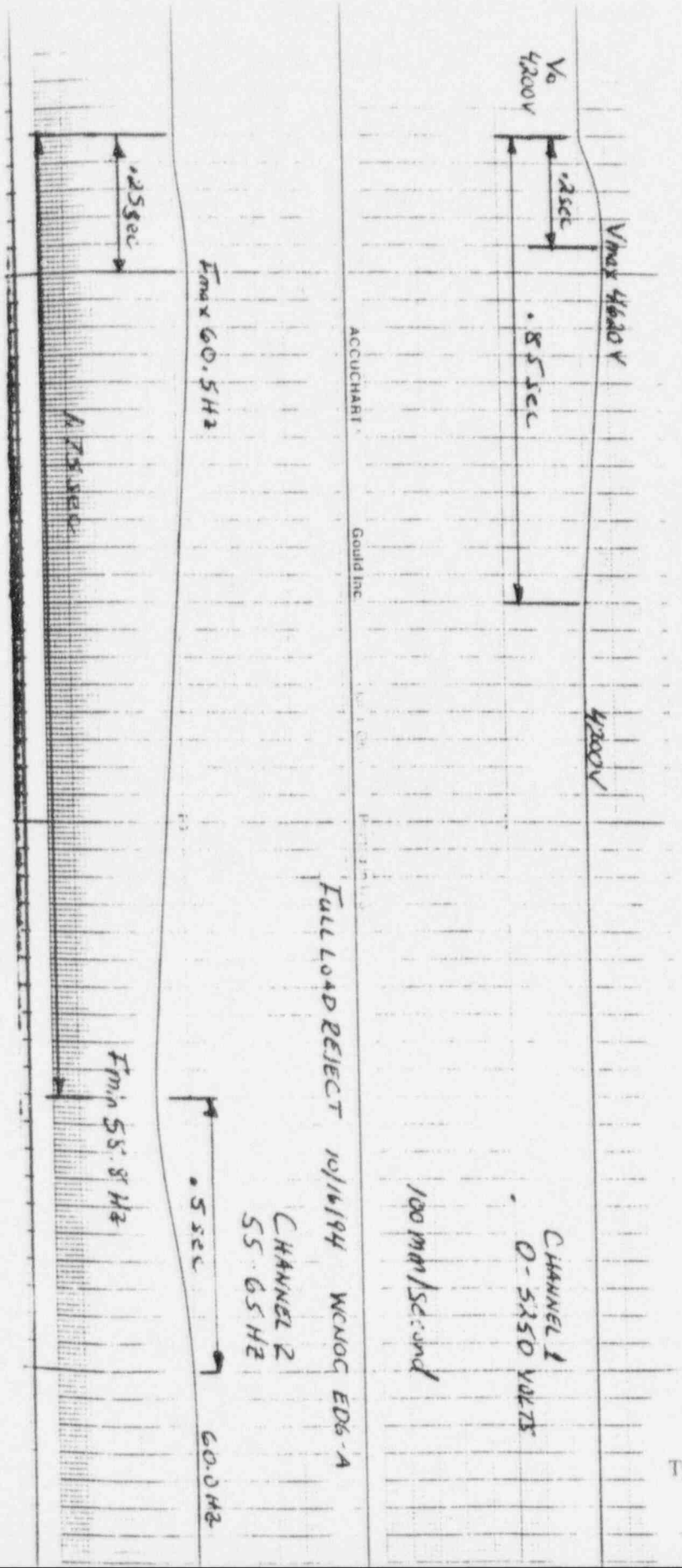

Figure 2
Typical Full-Load Rejection Test
(Page 1 of 1)

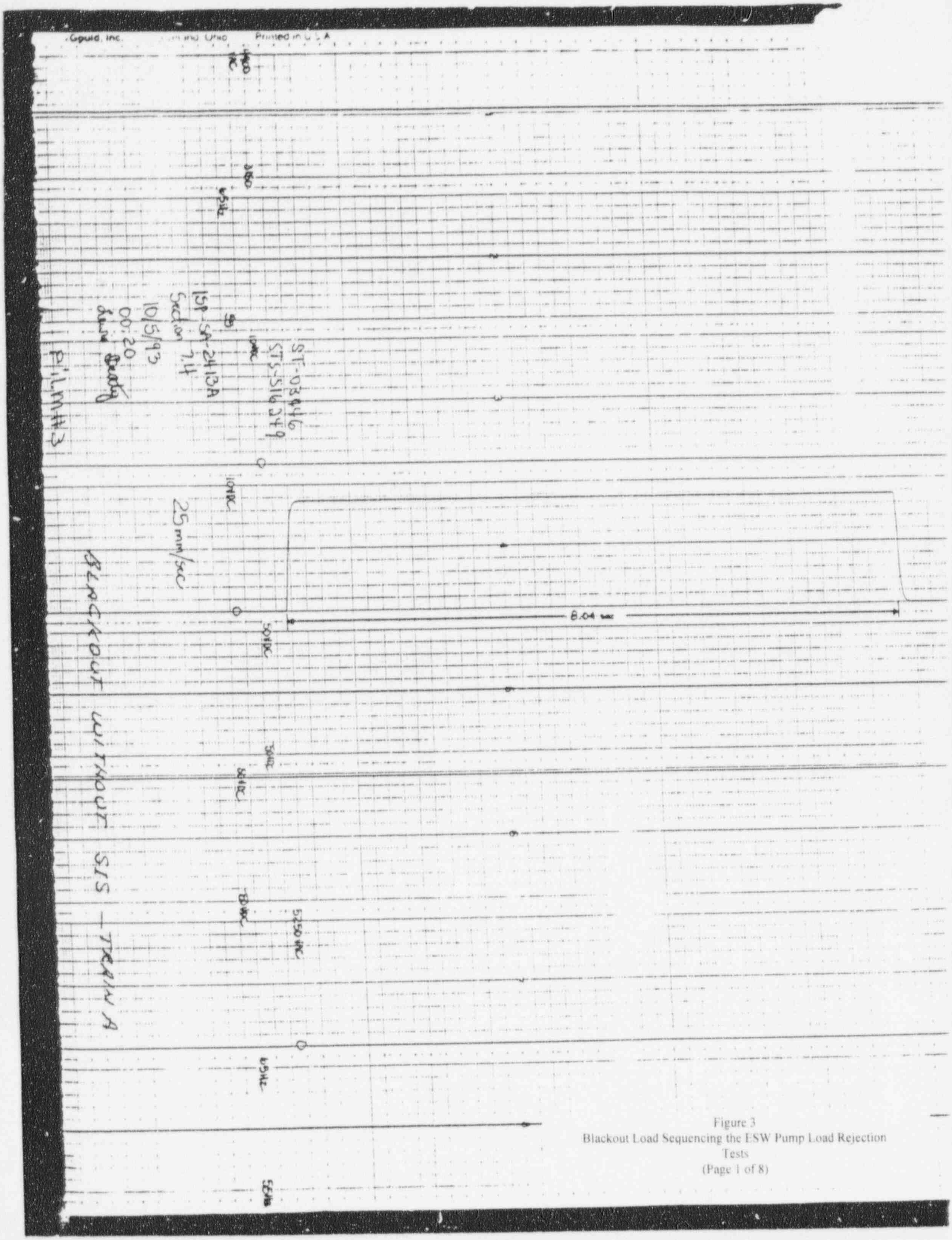

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 1 of 8)

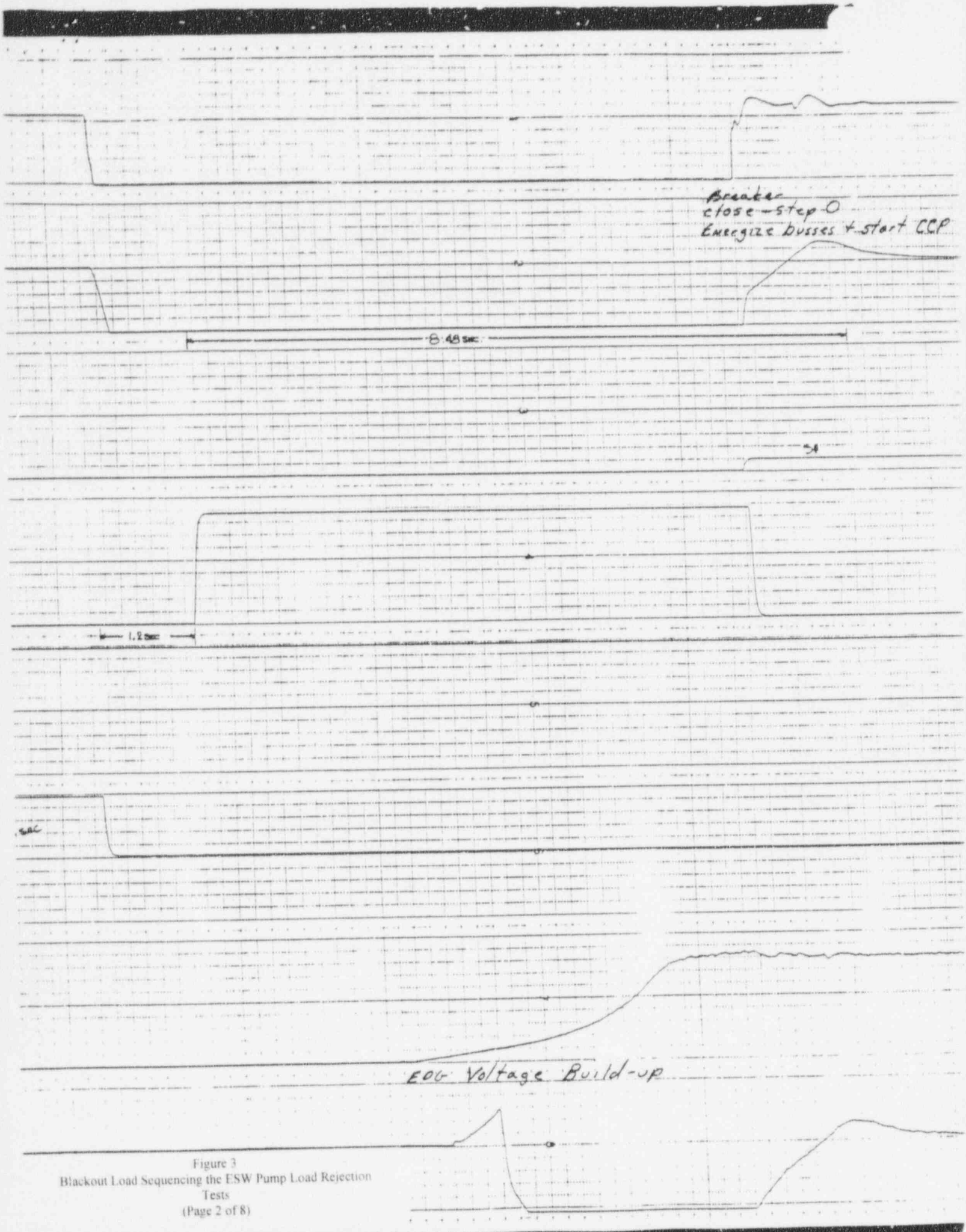

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 2 of 8)

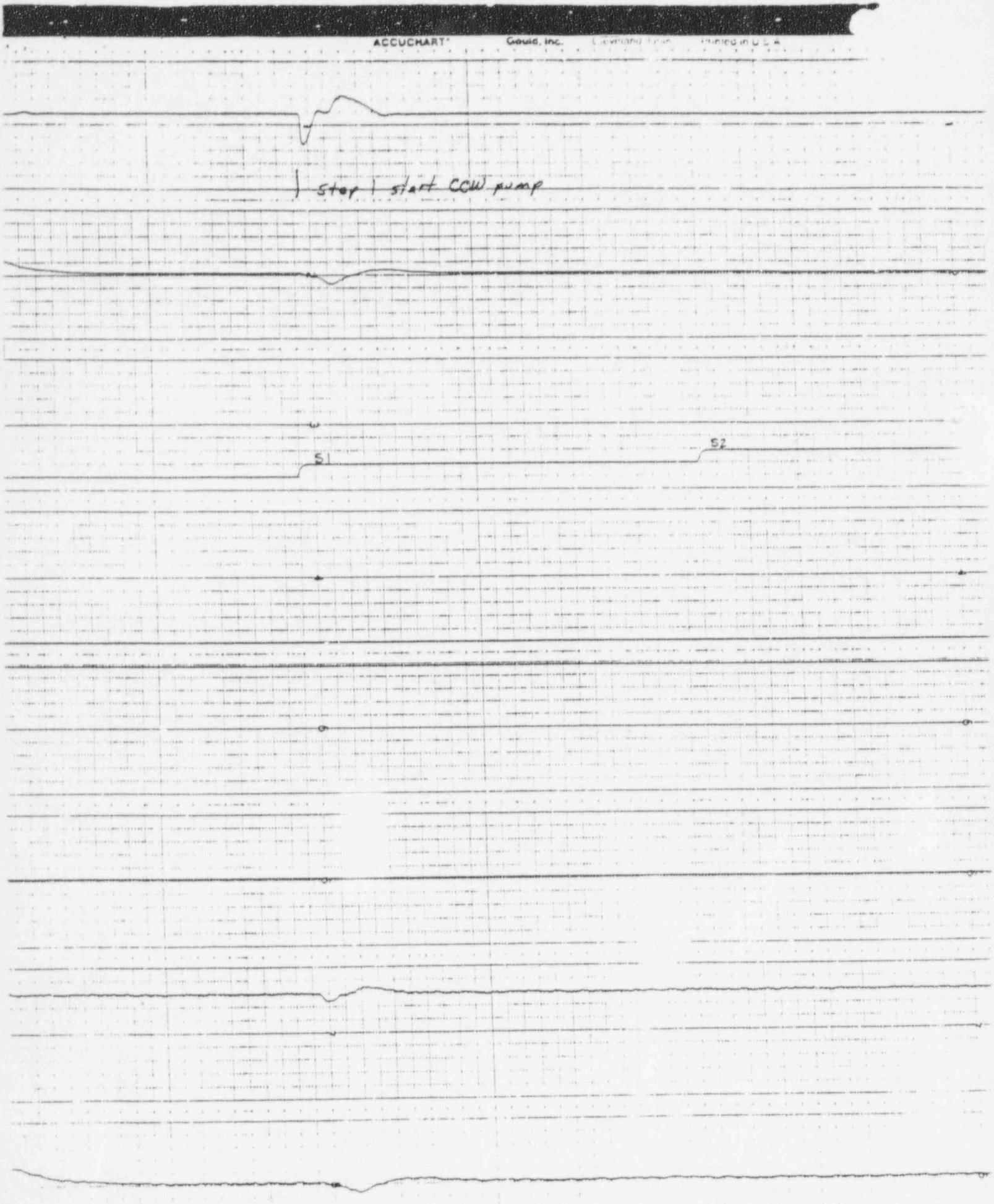

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 3 of 8)

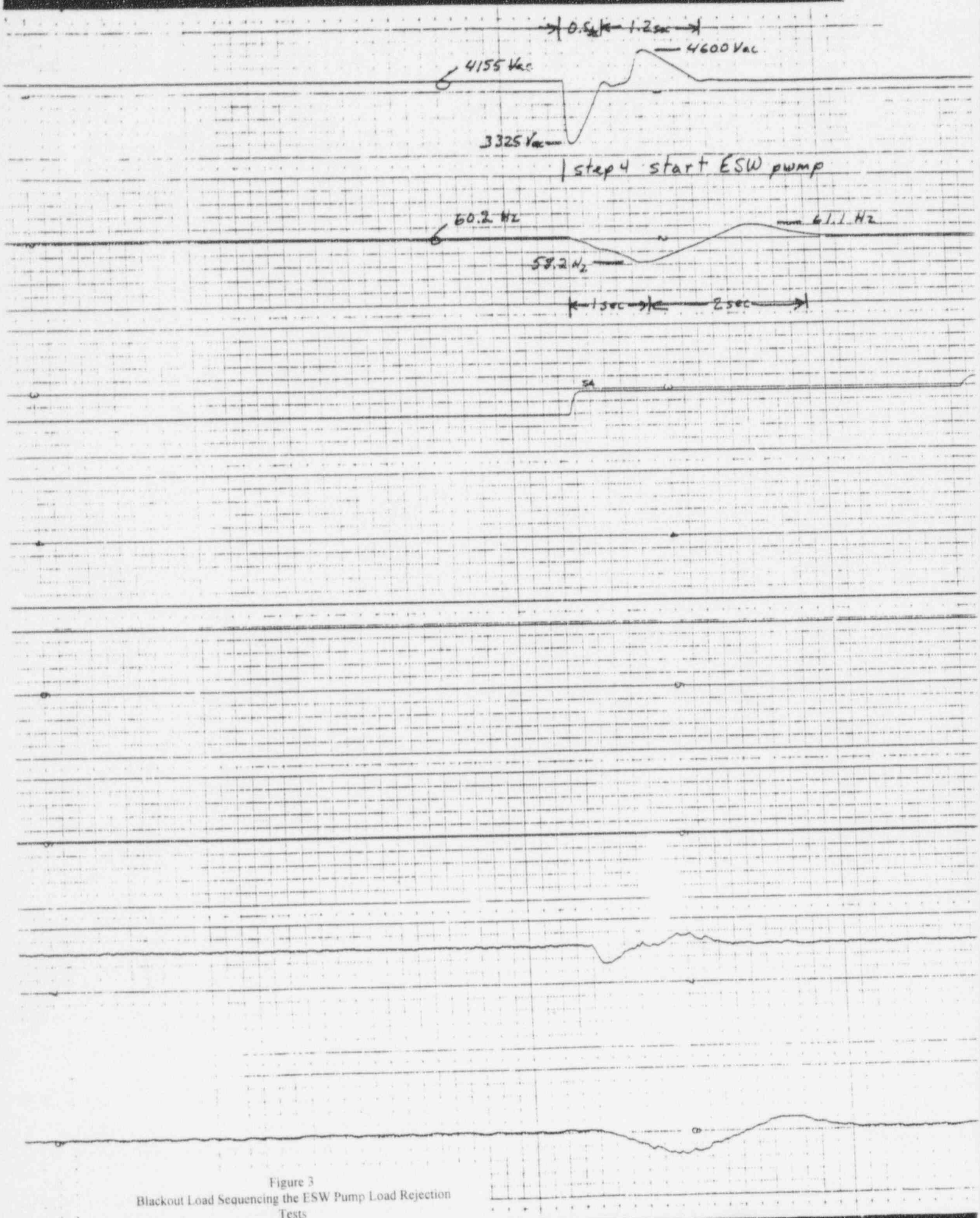

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 4 of 8)

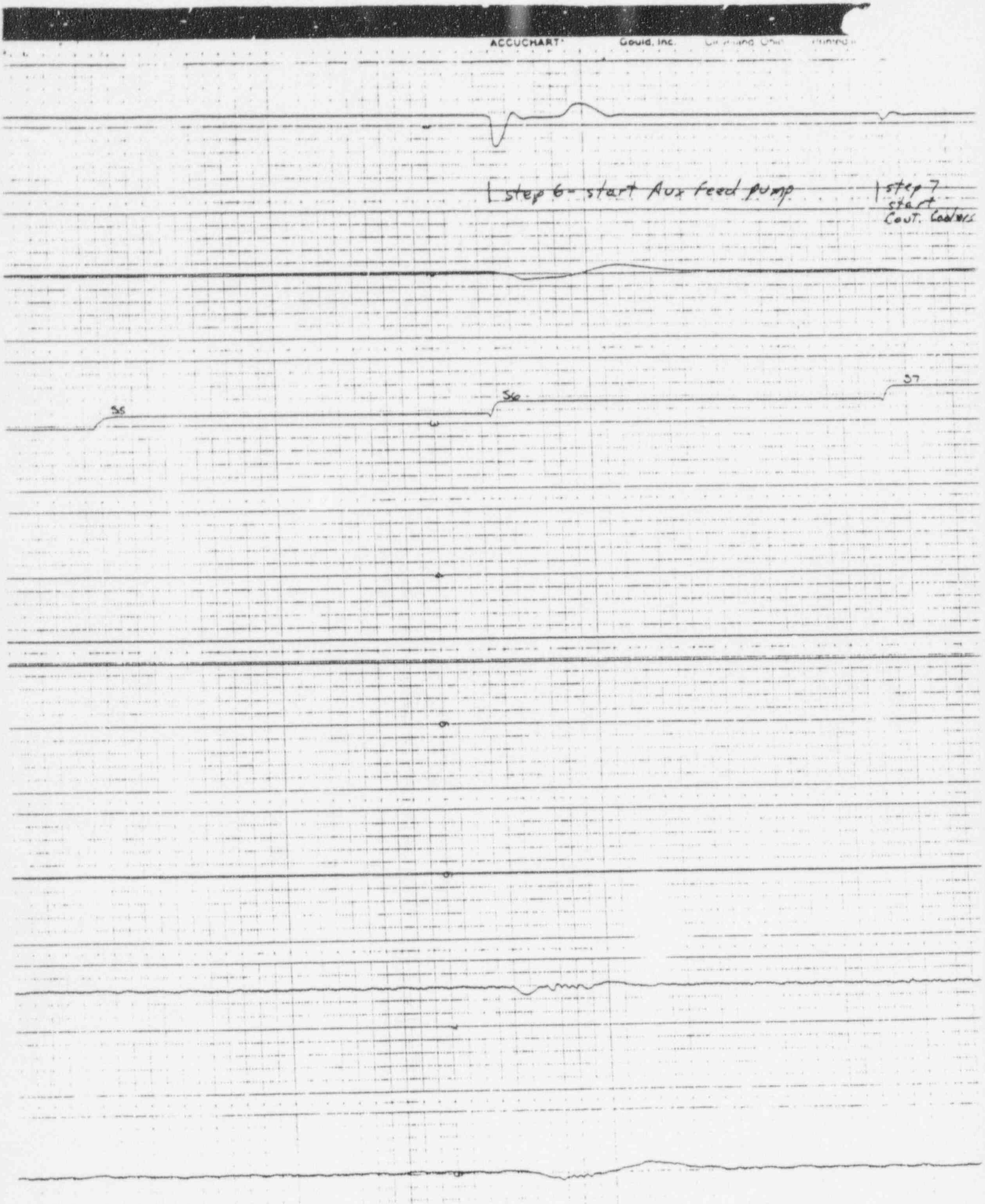

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 5 of 8)

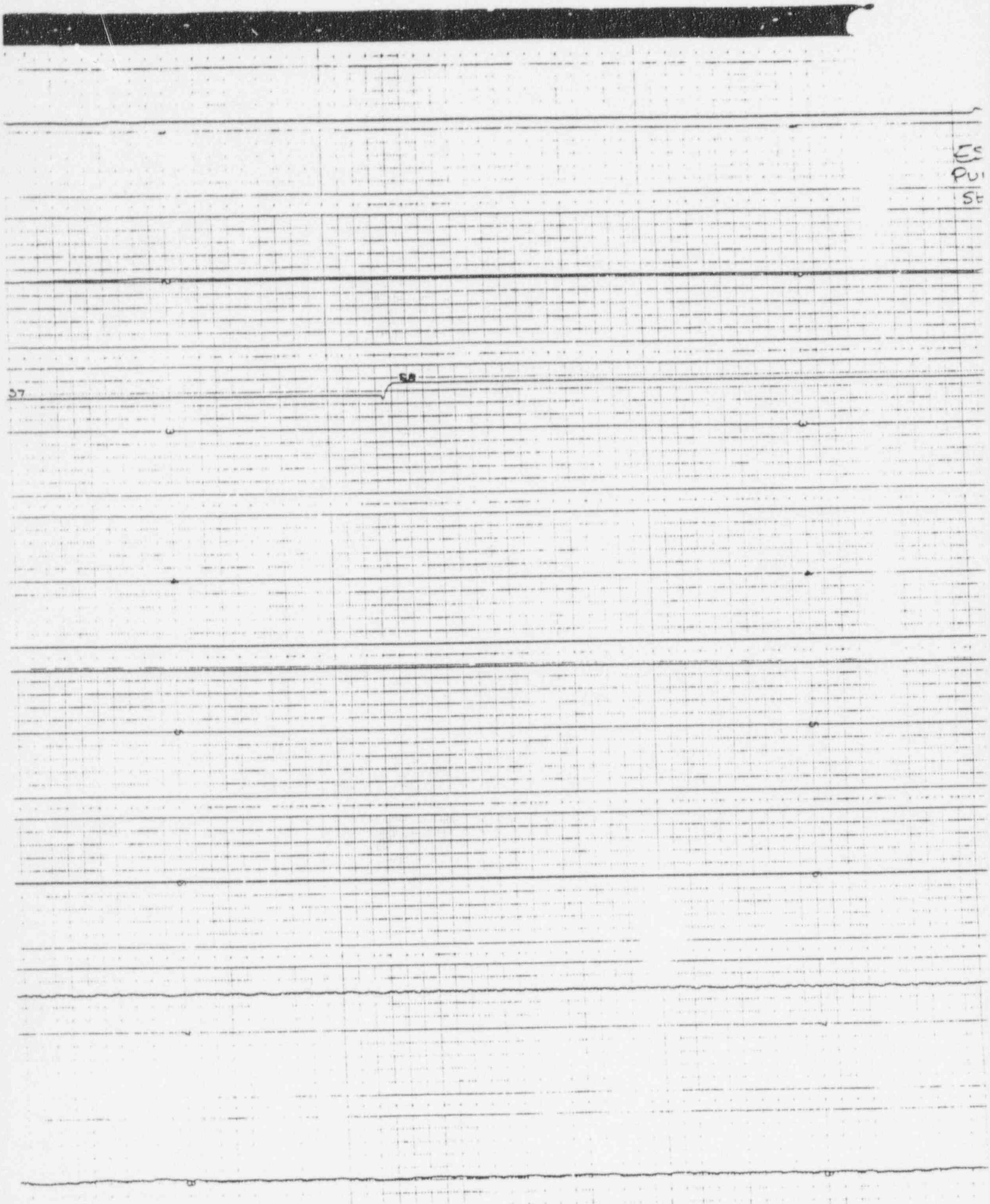

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 6 of 8)

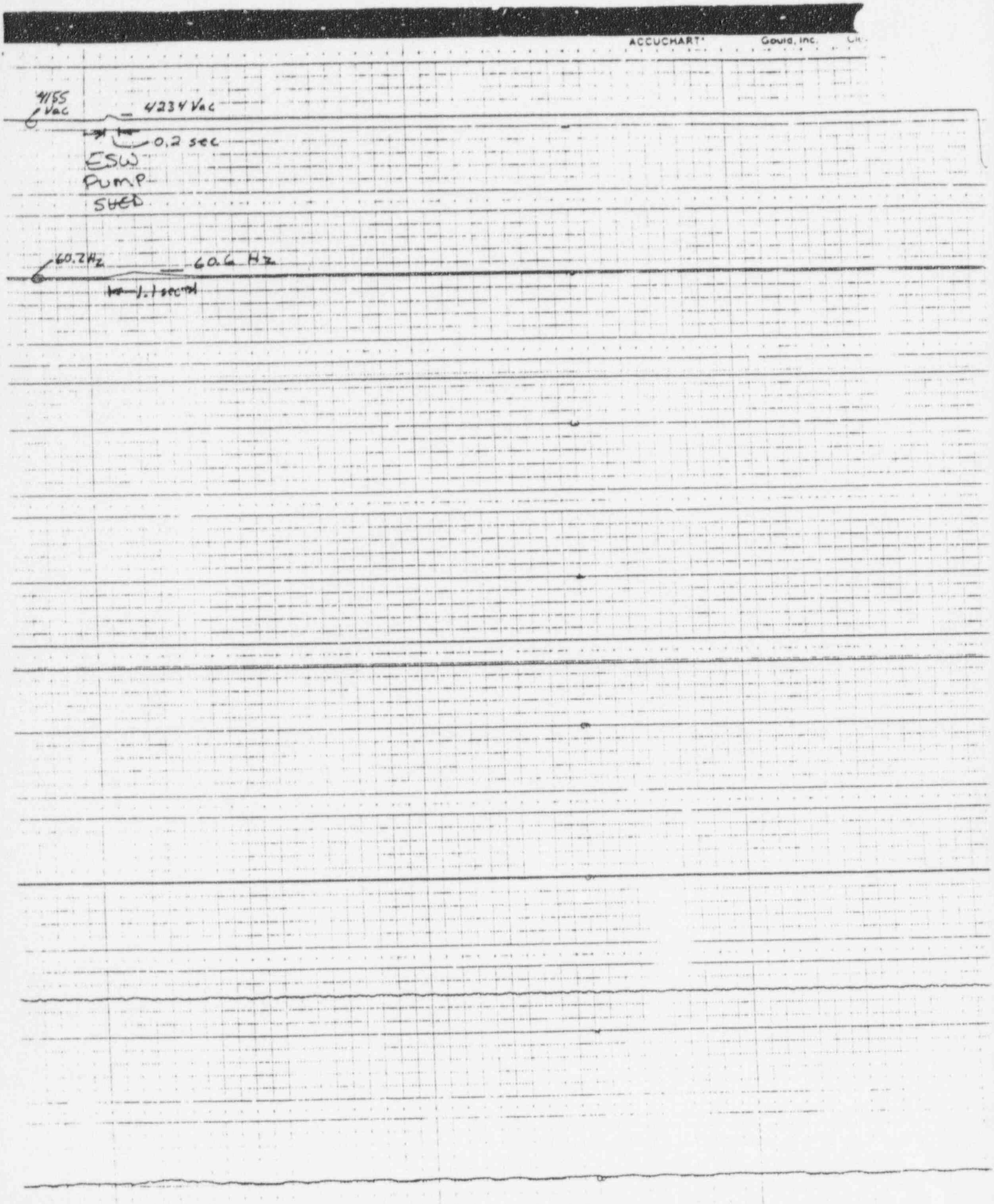

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 7 of 8)

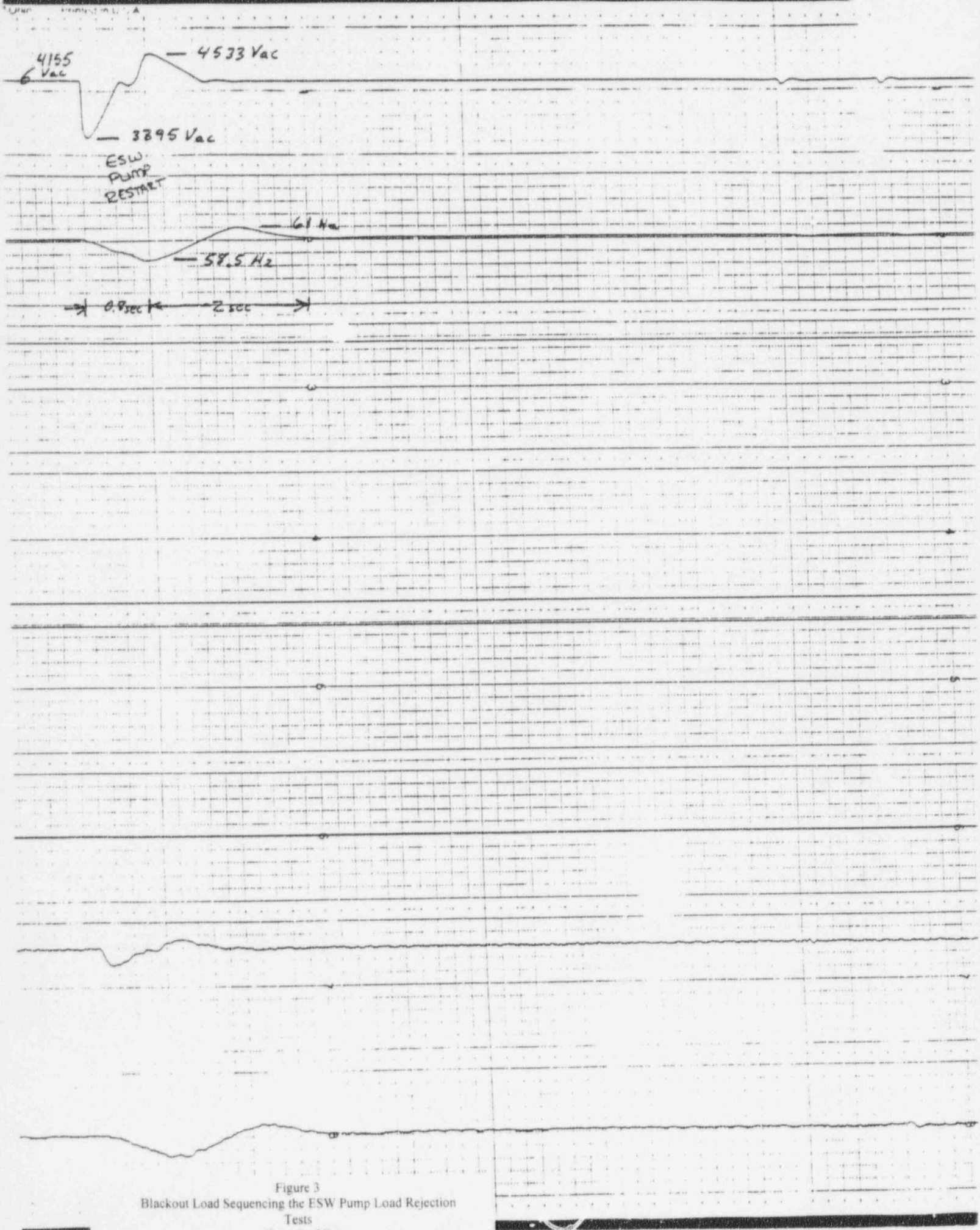

Figure 3
Blackout Load Sequencing the ESW Pump Load Rejection Tests
(Page 8 of 8)

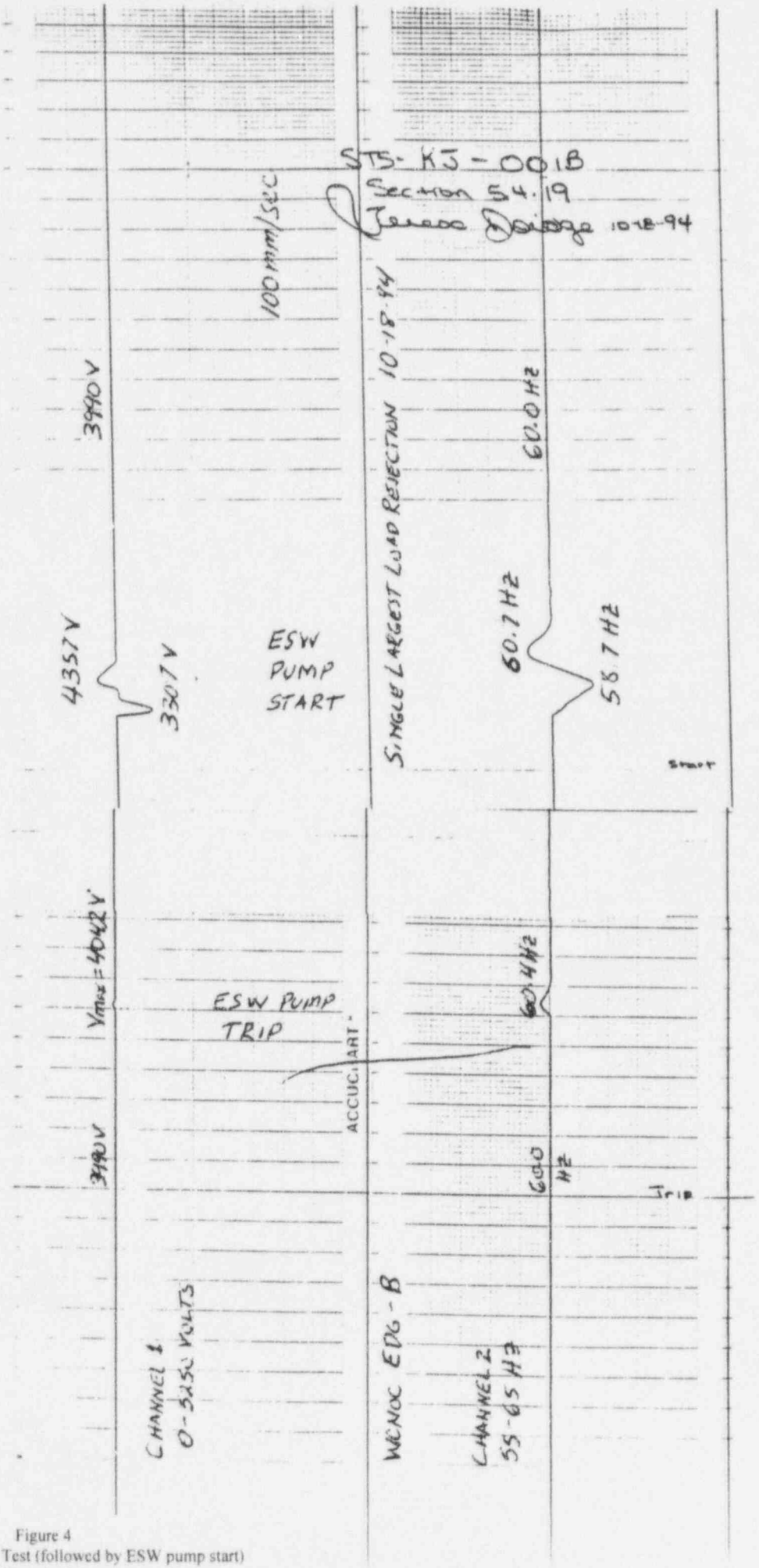

Figure 4
Single-Load Rejection Test (followed by ESW pump start)
(Page 1 of 1)

Attachment II

Technical Specification Mark-up Pages