



Entergy Nuclear Operations, Inc.
Vermont Yankee
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Vernon, VT
802-257-7711

Christopher J. Wamser
Site Vice President

BVY 13-034

May 1, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Response to Request for Additional Information Regarding Relief
Request No. RR-PR-01
Vermont Yankee Nuclear Power Station
Docket No. 50-271
License No. DPR-28

REFERENCES: 1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Inservice Testing Program Plan for the Fifth Ten-Year Interval," BVY 13-008, dated February 1, 2013

2. Letter, USNRC to Entergy Nuclear Operations, Inc., "Vermont Yankee Nuclear Power Station – Request for Additional Information Relating to Relief Request No. RR-PR-01 Associated with the Fifth 10-Year Inservice Testing Interval (TAC No. MF0625)," NPY 13-040, dated April 2, 2013

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (Entergy) submitted the inservice test (IST) program and relief requests for the fifth 10-year interval for Vermont Yankee Nuclear Power Station. This letter provides supplemental information to address a request for additional information (RAI) received on April 2, 2013 (Reference 2). Attachment 1 to this submittal provides Entergy's response to the RAI. Attachment 2 contains the requested service water pump IST data.

This letter contains no new regulatory commitments.

Should you have any questions concerning this letter or require additional information, please contact Mr. Robert Wanczyk at 802-451-3166.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Wamser", with a long horizontal line extending to the right.

CJW/plc

A047
NRR

Attachments: 1. Response to Request for Additional Information
2. Inservice Test Data

cc: William M. Dean
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
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King of Prussia, PA 19406-2713

Mr. Richard V. Guzman, Project Manager
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USNRC Resident Inspector
Entergy Nuclear Vermont Yankee, LLC
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Vernon, Vermont 05354

Mr. Christopher Recchia
Commissioner
Vermont Department of Public Service
112 State Street – Drawer 20
Montpelier, Vermont 05620-2601

Attachment 1

Vermont Yankee Nuclear Power Station
Response to Request for Additional Information

**REQUEST FOR ADDITIONAL INFORMATION FOR
RELIEF REQUEST NO. RR-PR-01
RELATED TO TESTING OF SERVICE WATER PUMPS
ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271**

The Nuclear Regulatory Commission (NRC) staff is reviewing the information provided by Entergy Nuclear Operations, Inc for Vermont Yankee Nuclear Power Station, in its letter dated February 1, 2013, and has determined that additional information is necessary to complete the review of Relief Request No. RR-PR-01. The NRC staff has determined that additional information requested below will be needed to support its review.

RAI RR-P01-1

It is stated in part, in Section 6 of the Reference, that, "scheduled inspection/replacement of Service Water pumps will be on a 6 year fixed interval for this Relief Request." Please confirm that this means that each service water pump will be inspected, replaced, or rebuilt every six years or less. Also, please provide the last date of the inspection or replacement of each service water pump.

Response

Each service water pump will be inspected and rebuilt, as required, or replaced at least once every six years. The 'A' Service Water pump was replaced May 16, 2007. The 'B' Service Water pump was replaced June 14, 2012. The 'C' Service Water pump was replaced May 17, 2009. The 'D' Service Water pump was replaced June 1, 2007.

RAI RR-P01-2

Section 6 also states, in part, that, "Once per Cycle, typically during each refueling outage when plant loads are minimized, a head-flow curve will be generated in accordance with ISTB-5210, and the pump comprehensive test will be performed in accordance with ISTB-5223." Explain how generating a new head-flow curve for each pump approximately every two years, instead of using the same head-flow curve for the 6-year inspection/replacement interval, will not mask pump degradation.

Response

It is only by comparing the most recent 5-point curve to the previous curves that pump degradation can be detected. An "as-found" curve is generated each refueling outage (RFO) and compared to the curve from the previous cycle, the curves since the most recent pump rebuild, and the original manufacturer's curve. A new "as left" curve is generated for each lift adjustment or replacement. This assures the required pump capacity is available until the next scheduled adjustment, replacement, or RFO.

RAI RR-P01-3

Additionally, Section 6 states, in part, that, "On a quarterly basis, surveillance will be performed by measuring pump differential pressure, motor vibration, and motor amps.

The data will be compared to the degree possible with the head-flow curve and vibration measurements and amps obtained during the previous 5-point test." Explain how the repeatability of the pump flow rate will be achieved, since as you noted in the above referenced document the pump flow rate cannot be measured. Also, please explain how the pump differential pressure will be measured.

Response

As stated, flow rate cannot be measured during the quarterly test, because the plant was constructed without instrumentation to obtain individual service water pump flow during operation. During the quarterly test, vibration readings are obtained and compared to the value at the ~2700 gallon per minute test point on the 5-point curve. Also during the quarterly test, differential pressure (d/p) is determined by measuring discharge pressure minus the temperature-corrected, bay level measured, correlated pressure. Comparison of the differential pressure to the 5-point test is somewhat subjective, since it is affected by varying the number of operating pumps, plant loads, and cross-tied header operation. Motor amps are a measure of pump load and are conservatively compared to the quarterly vibration measurement and d/p measurement.

Primarily, the quarterly test only allows that vibration and amps be monitored within the acceptance criteria, and can be correlated to the measured d/p, but is only indicative of that pumps performance related to the number of pumps operating at the time. The once per cycle test data is used to assure the required pump capacity is available until the next scheduled adjustment, replacement, or RFO.

RAI RR-P01-4

Please provide the inservice test data for the past 10 years for all of the service water pumps noted in this request.

Response

The inservice test (IST) 5-point (capacity) test, quarterly d/p and amperage test, and quarterly pump vibration test data for the past 10 years for all of the Service Water pumps noted in the relief request are included in Attachment 2. Note that vibration data, which is taken at all 5 points during the 5-point test, is not included in capacity test results due to the volume of data.

Additional notes on the test data:

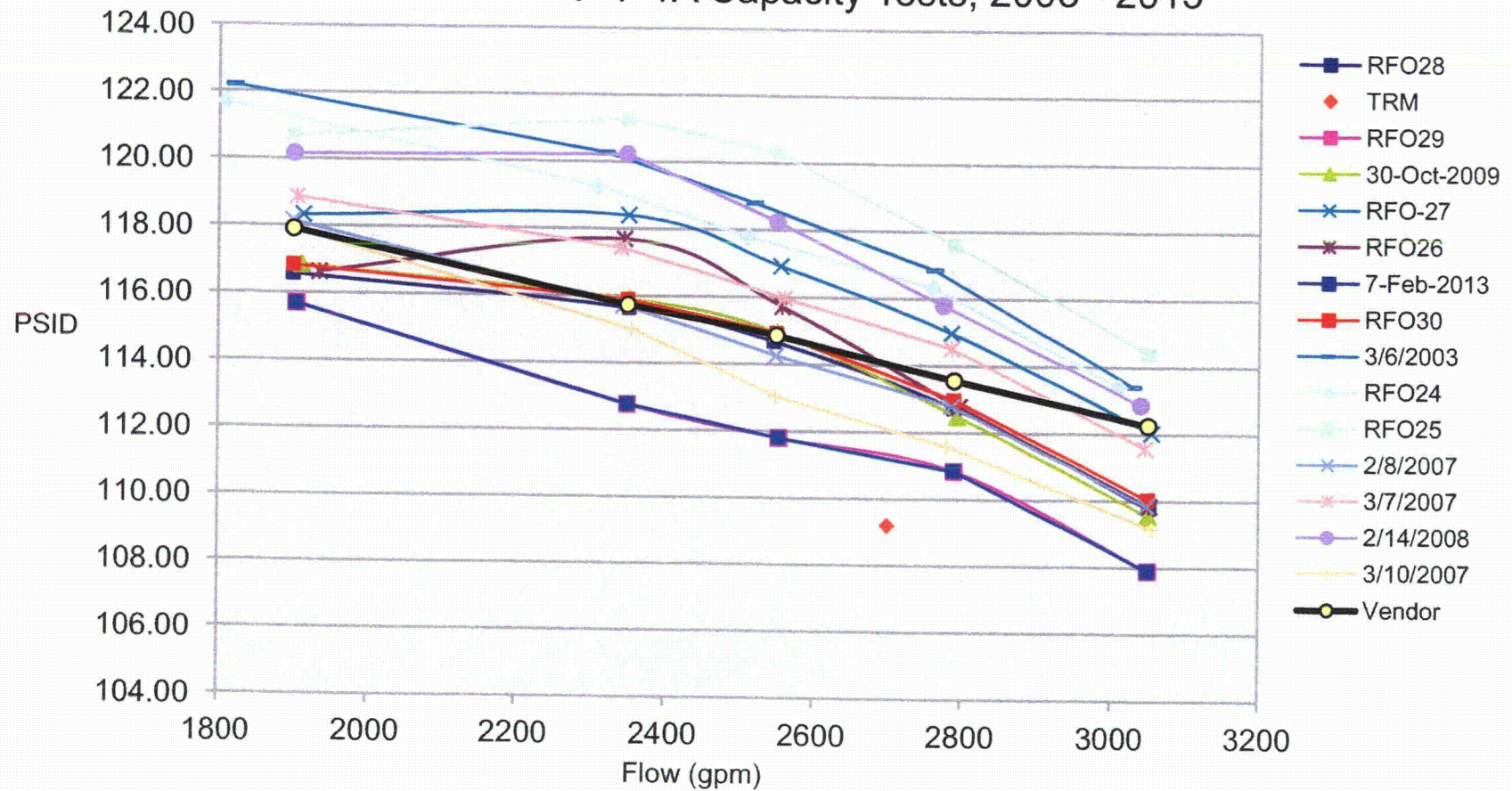
1. Vibration test data is in units of inches per second. The .325"/sec. is generic OM Code Alert maximum, however point A-1 is approx. ½ of maximum.
2. The quarterly test data is from the IST trend database (original data transferred from completed test forms).
3. The 5-point test data is from the IST "set-up" validation spreadsheet (official data is contained in the completed test form). This data includes the scheduled RFO surveillance and lift adjustments.

Attachment 2

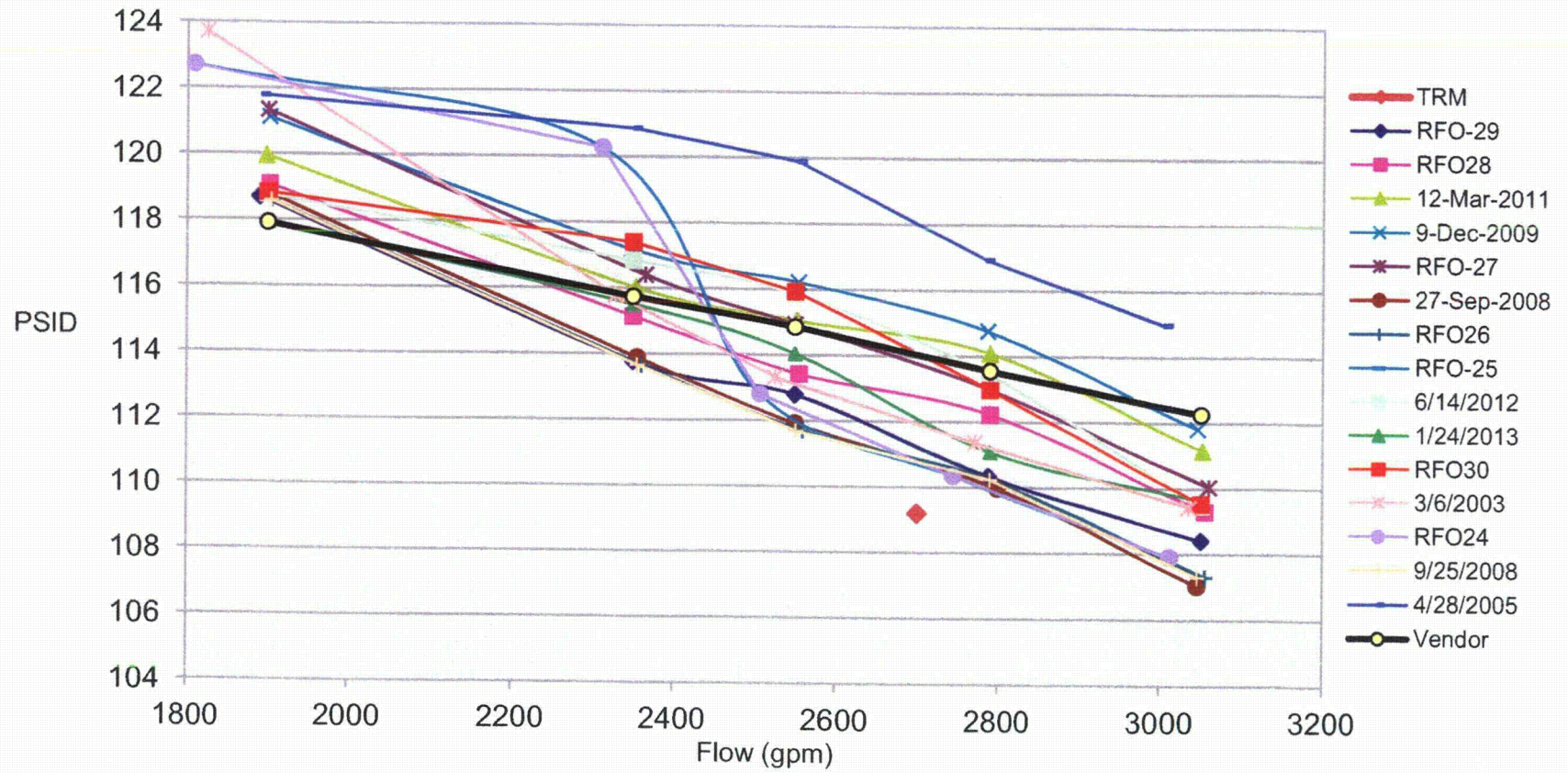
Vermont Yankee Nuclear Power Station

Inservice Test Data

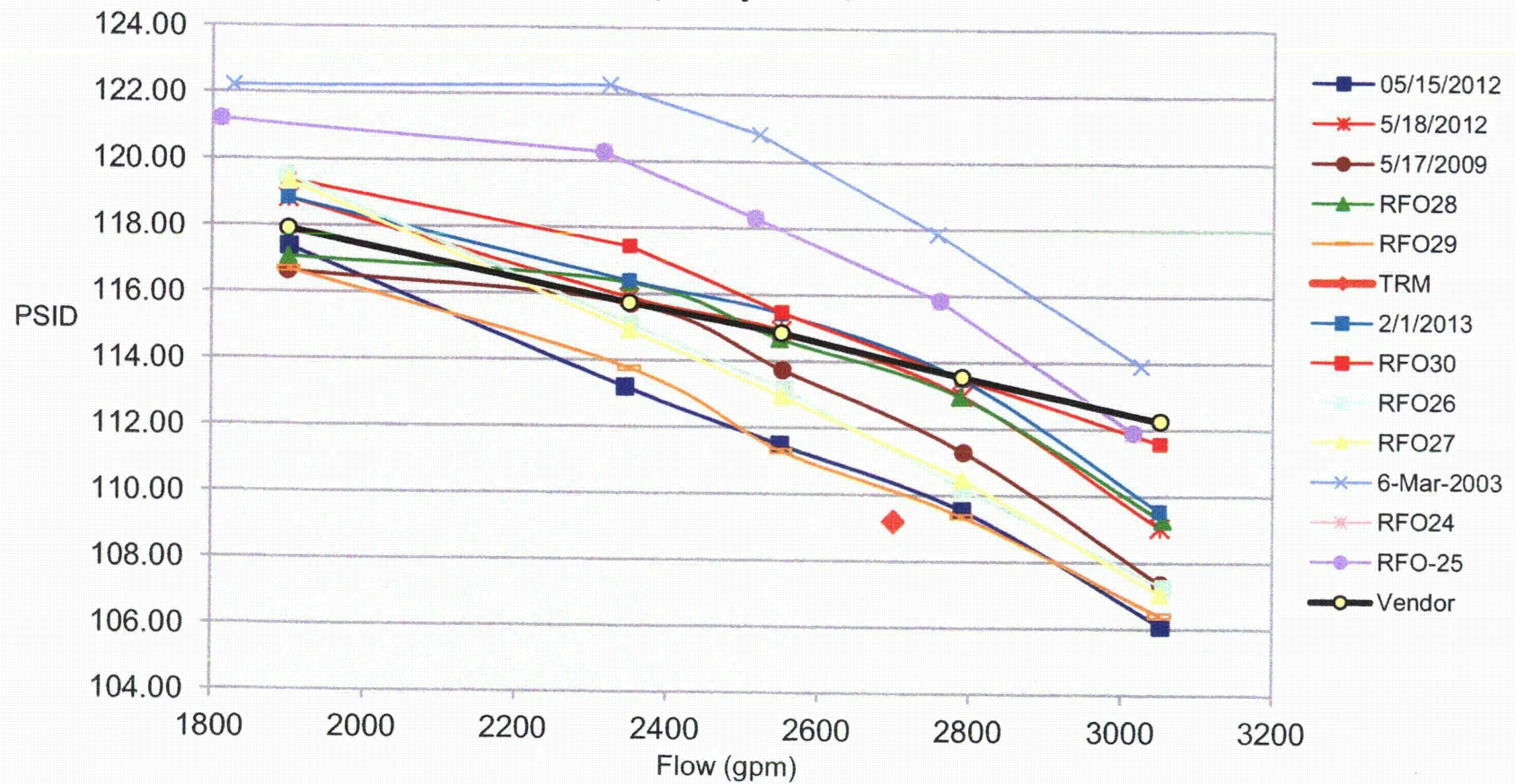
P-7-1A Capacity Tests, 2003 - 2013



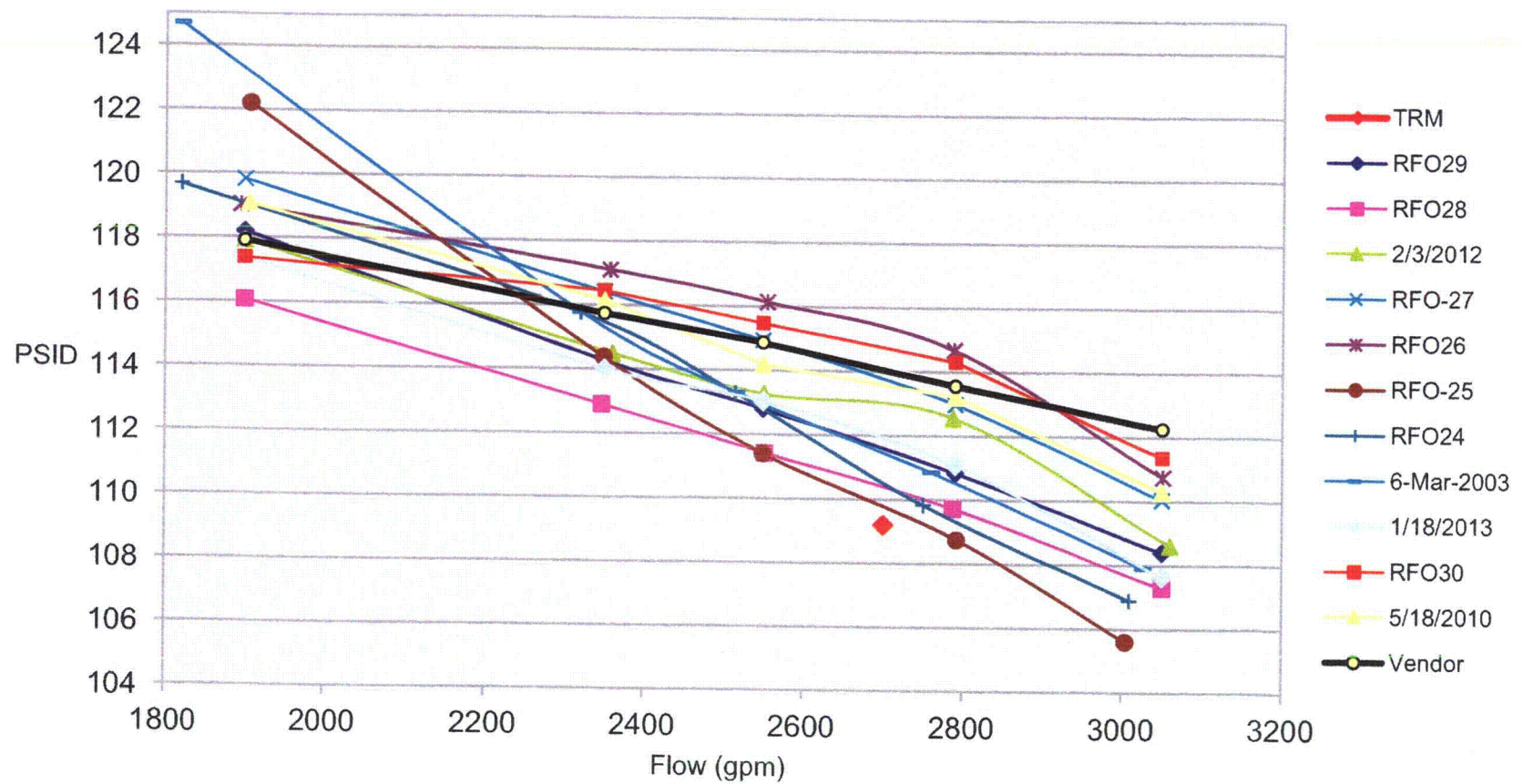
P-7-1B Capacity Test, 2003 - 2013



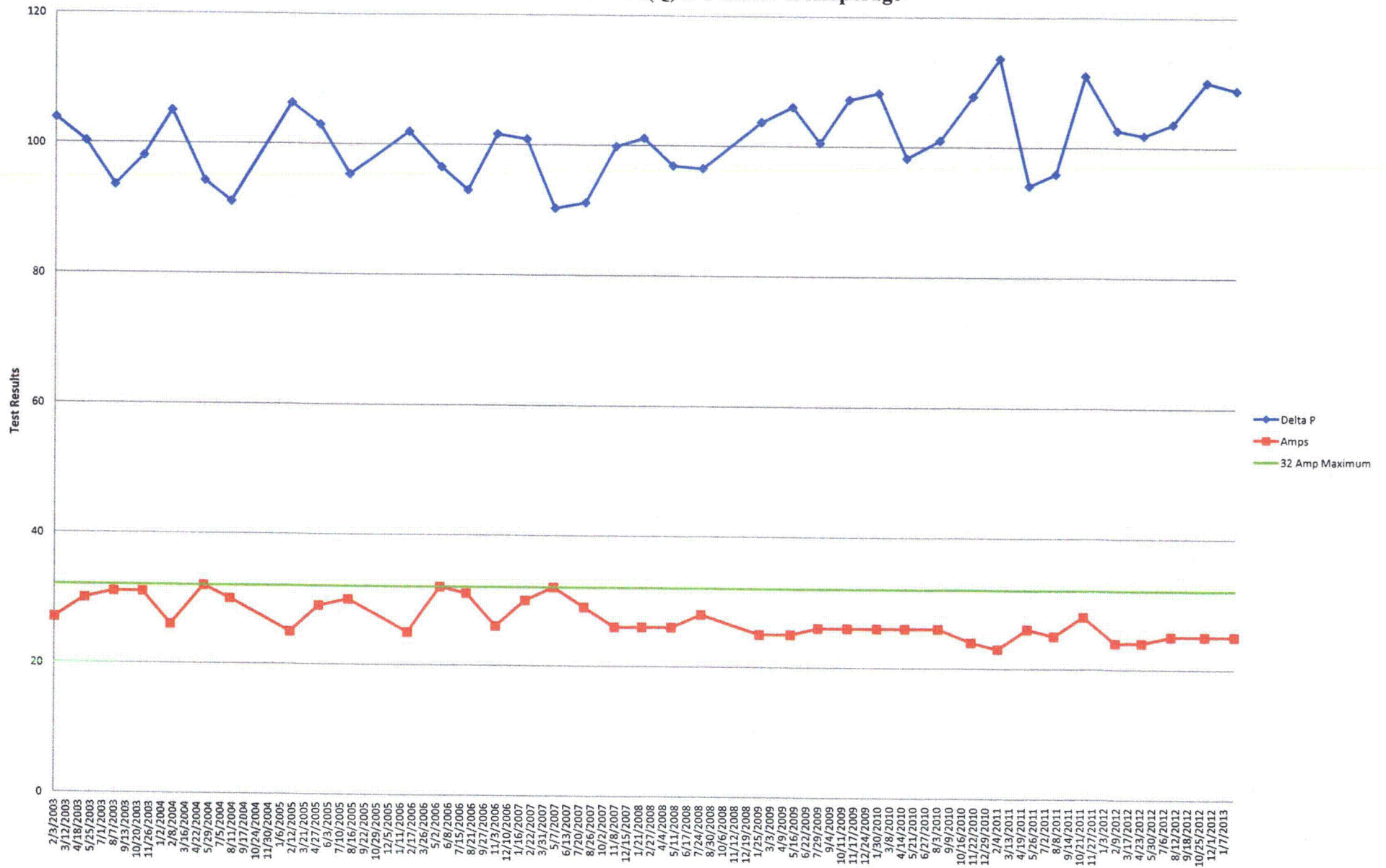
P-7-1C Capacity Test, 2003 - 2013



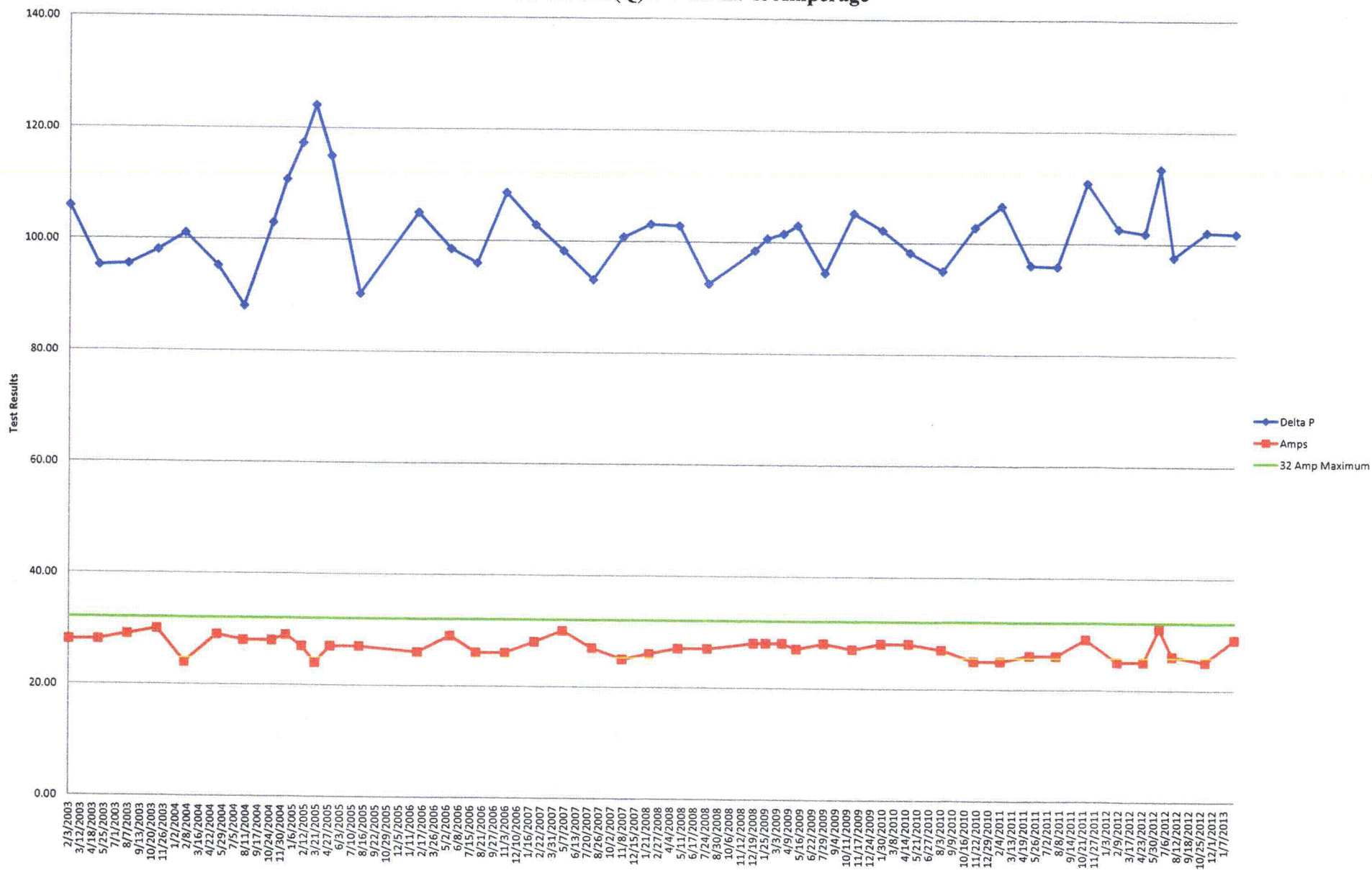
P-7-1D Capacity Test, 2003 - 2013



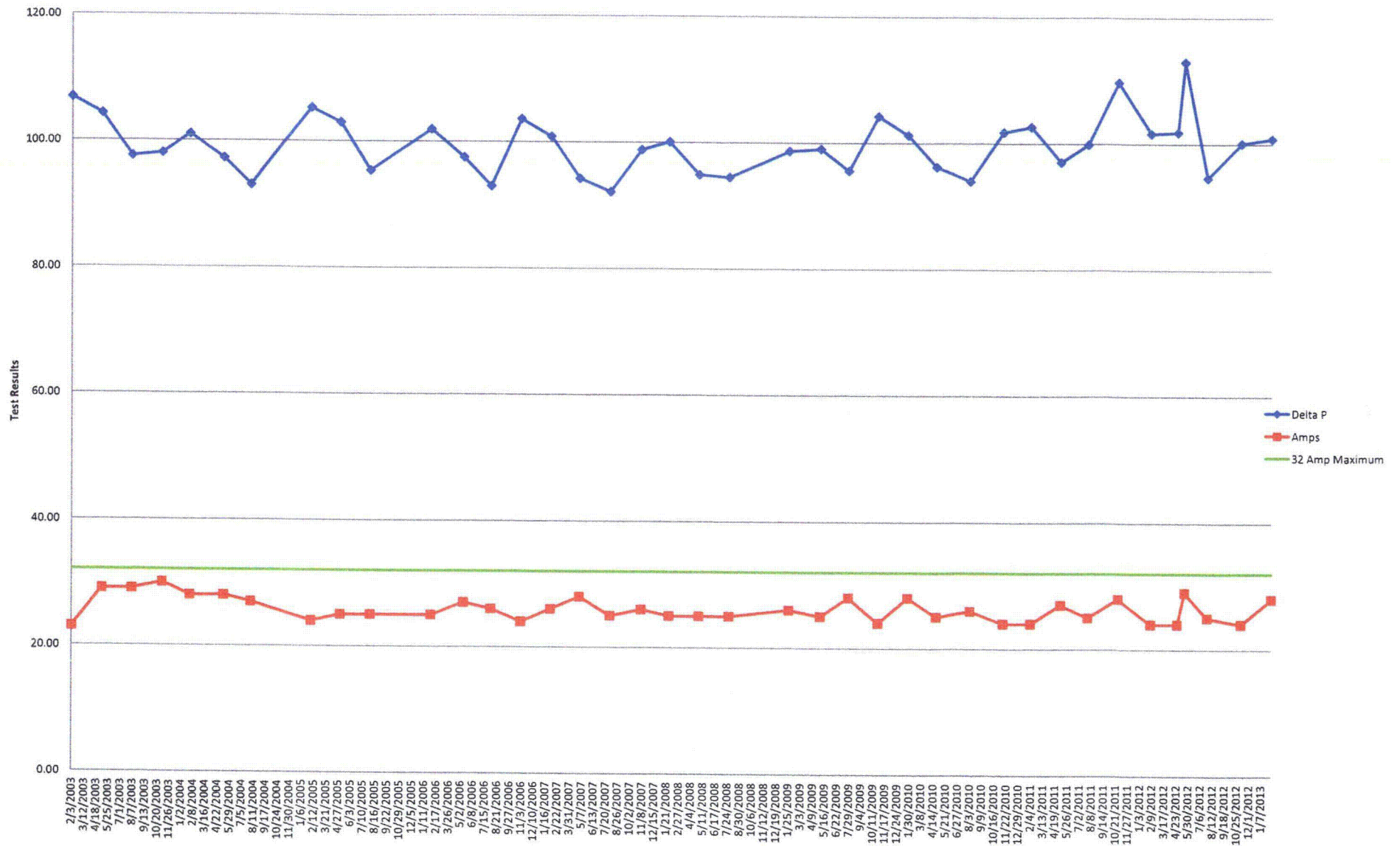
OP 4181.01(Q) P-7-1A ΔP & Amperage



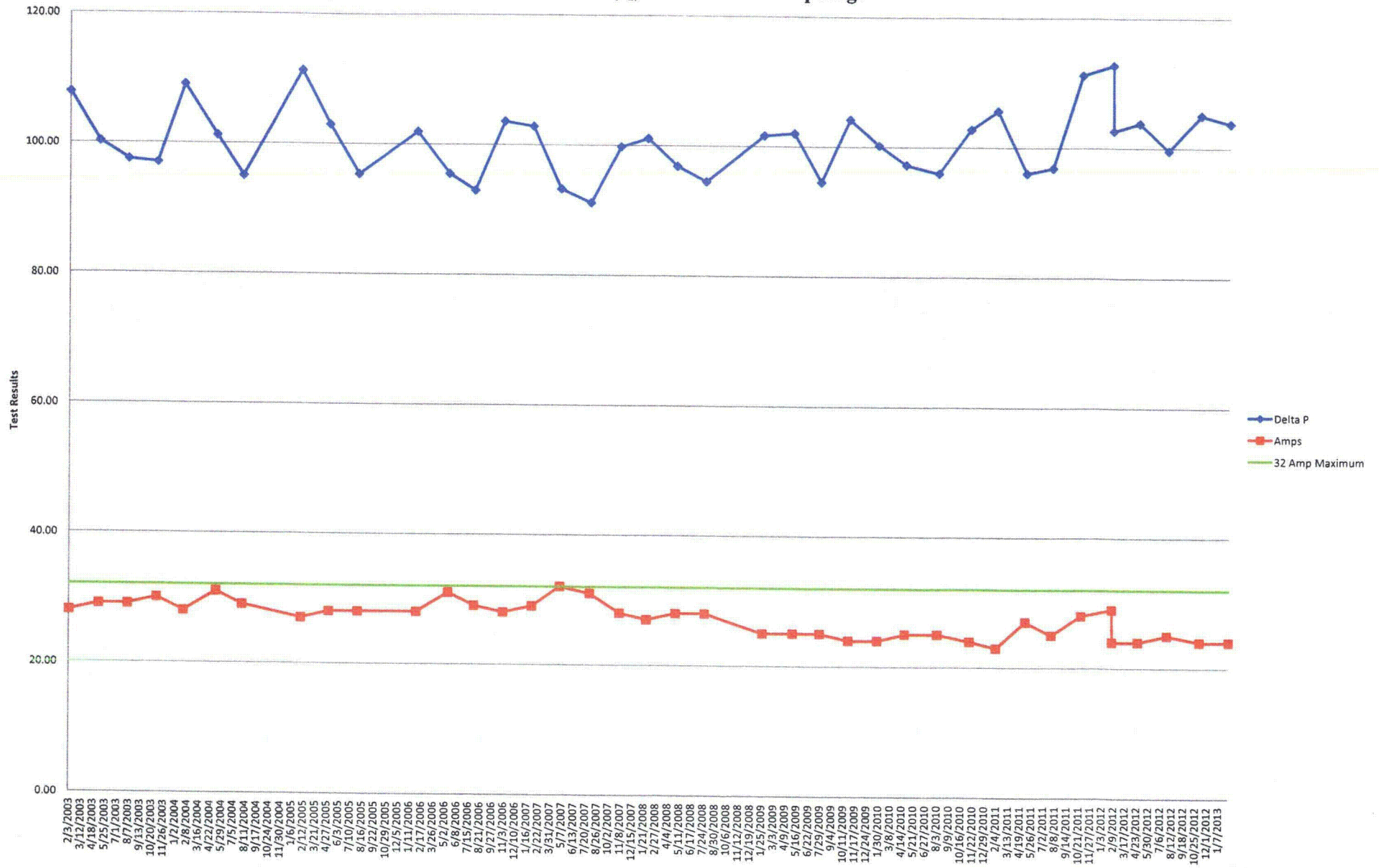
OP 4181.01(Q) P-7-1B ΔP & Amperage



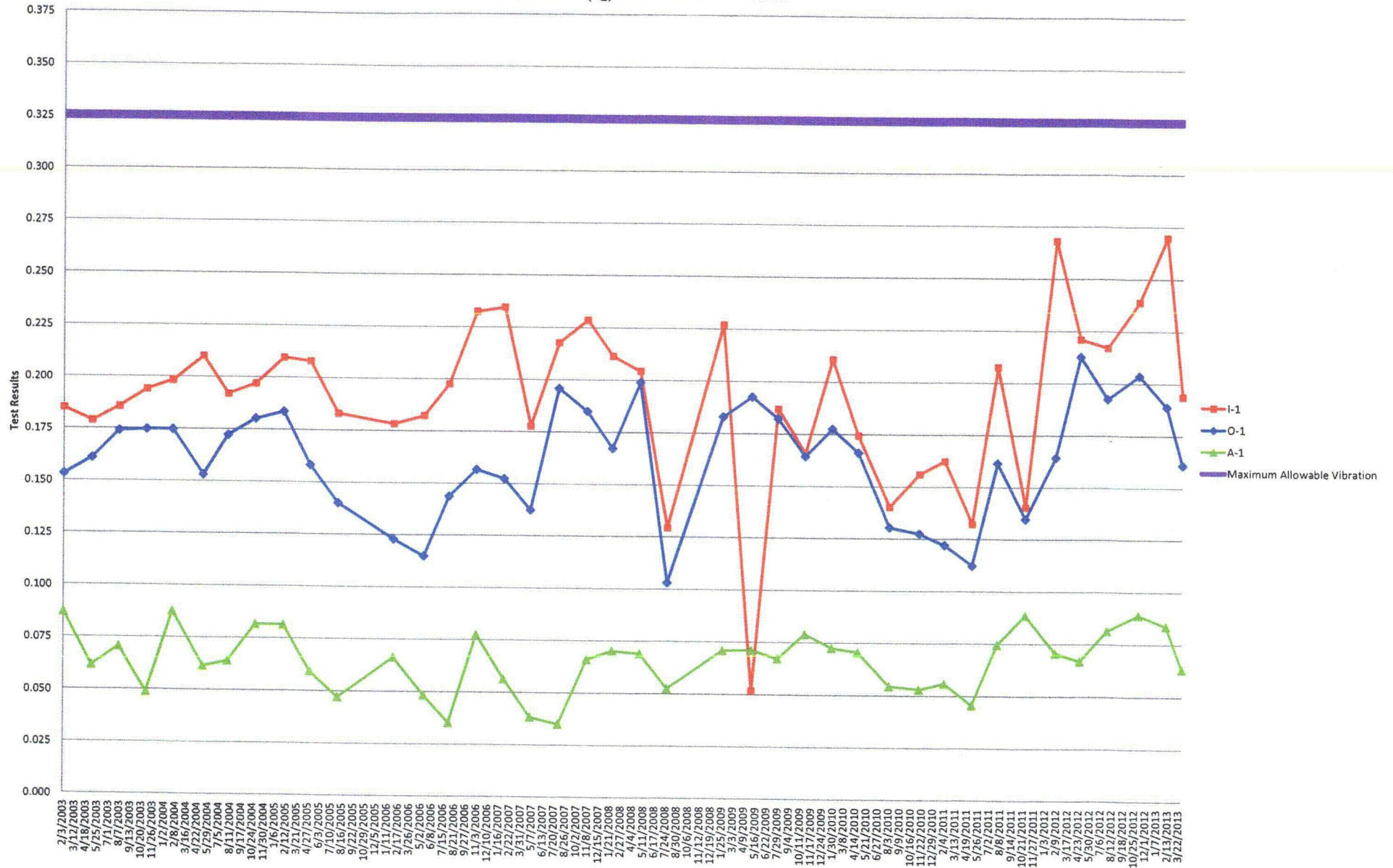
OP 4181.01(Q) P-7-1C ΔP & Amperage



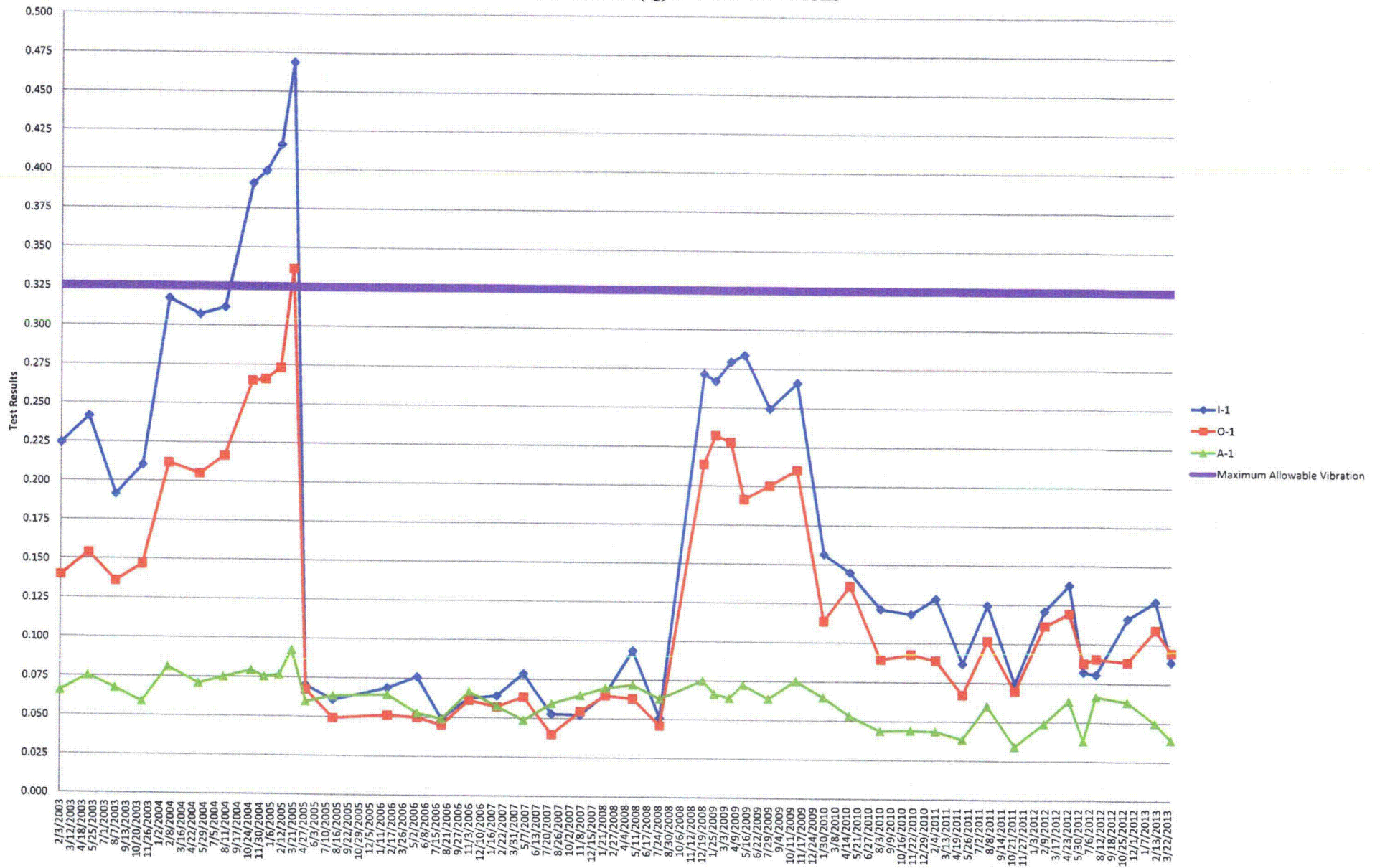
OP 4181.01(Q) P-7-1D ΔP & Amperage



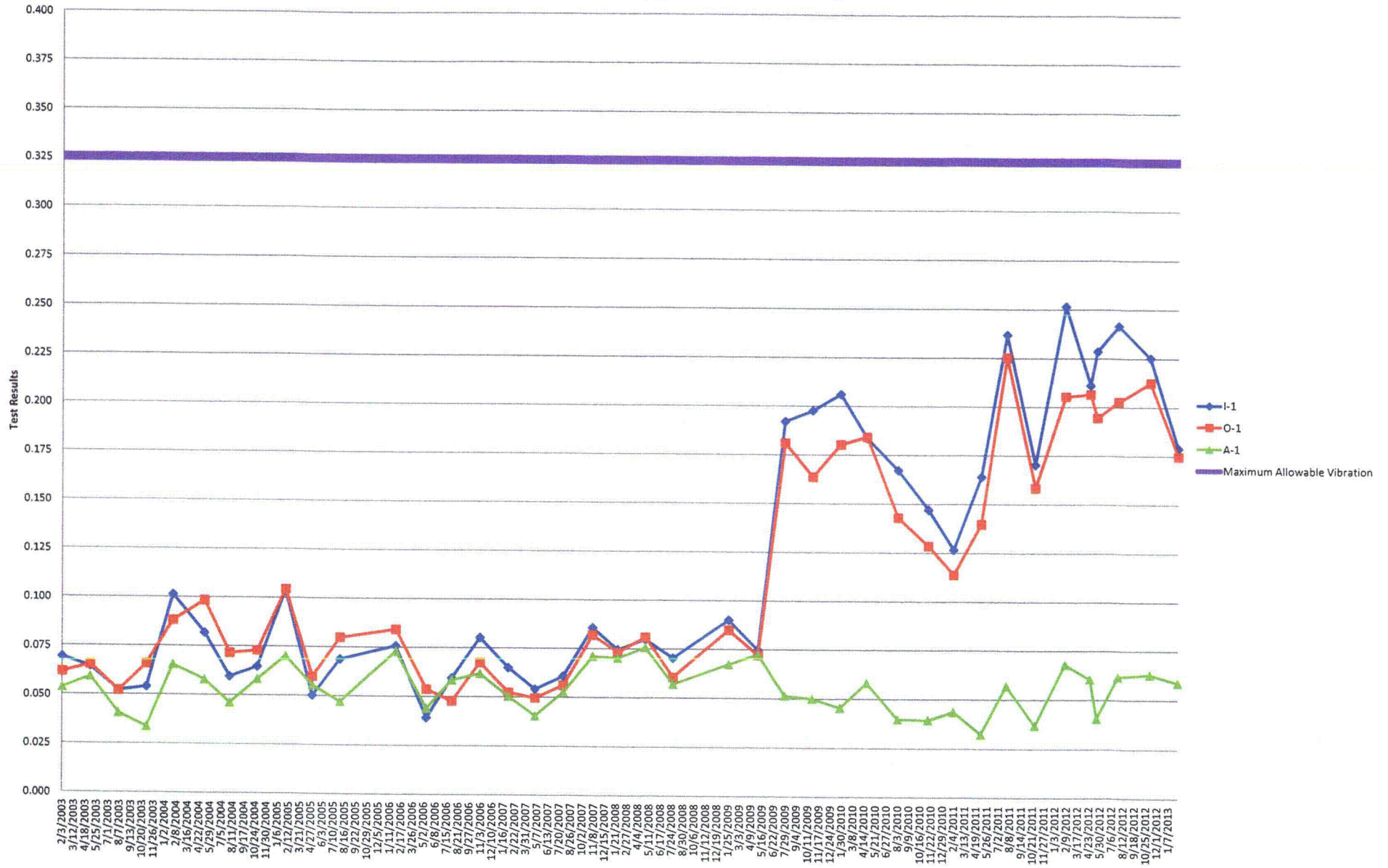
OP 4181.01(Q) P-7-1A Vibrations



OP 4181.01(Q) P-7-1B Vibrations



OP 4181.01(Q) P-7-1C Vibrations



OP 4181.01(Q) P-7-1D Vibrations

