ENCLOSURE 1

RESPONSES TO THE GAP ANALYSIS

Introduction

On November 20, 2012, Northern States Power – Minnesota (NSPM) presented to the NRC the results of a Gap Analysis performed to verify the adequacy of the extended power uprate (EPU) documentation. Due to the delay in review of the Monticello Nuclear Generating Plant (MNGP) EPU License Amendment Request (LAR), the NRC was concerned that various aspects of the NRC review were no longer applicable. Through the Gap Analysis, NSPM demonstrated that various technical items required revision and some design and licensing bases information had changed, but overall the body of EPU documentation was correct with the exception of the issues identified for correction.

As part of that discussion, NSPM provided the NRC with a table of items that had changed in the EPU documentation. This table was discussed and NRC provided their comments on the documentation needed to close the items.

On January 21, 2013 NSPM provided a response to many of the Gap analysis items. This enclosure contains a brief synopsis of each of the remaining items discussed in the Gap Analysis, the information the NRC needed to close the gap (from the November 20, 2012 meeting with NRC), and the NSPM response to the identified gap.

Contents

Provided below are responses to the following items from the Gap Analysis:

Item 1 – Main Steam Line High Flow Trip - 10 CFR 21 Error Notification
Item 2 – RADTRAD - 10 CFR 21 Error Notification
Item 3 – Condenser Free Volume Change
Item 4 – Feedwater Transient Response Commitment Change
Item 5 – Environmental Assessment (EA) Changes

ITEM 1 - MAIN STEAM LINE HIGH FLOW TRIP - 10 CFR 21 ERROR NOTIFICATION

NRC REQUESTED INFORMATION: General Electric-Hitachi issued a 10 CFR 21 60-day Interim Notification on September 27, 2012 concerning a potential non-conservatism in calculation of Main Steam Line (MSL) choked flow rates. The NRC needs reasonable assurance that current configuration is acceptable. NSPM will need to provide a technical discussion of why 10CFR21 Notification is not applicable to MNGP or provide a change to MNGP Technical Specification Allowable Value.

NSPM RESPONSE:

Background

NSPM issued letter L-MT-08-052 (Reference 1-1) to the NRC which requested approval of an extended power uprate (EPU). As part of the EPU NSPM provided changes to the MNGP Technical Specifications (TS) associated with the planned power level change. NSPM did not identify the Main Steam Line High Flow trip as an impact of the EPU.

Subsequently, NSPM issued:

- L-MT-09-026 (Reference 1-2), which provided a response to EICB RAI No. 1. Included in this response was a description of NSPM calculation CA-95-075, Main Steam Line High Flow Setpoint, Revision 1. NSPM also provided a copy of the calculation for NRC review.
- L-MT-09-027 (Reference 1-3), which provided a response to EICB RAI No. 3. This response stated that the Main Steam Line Flow – High TS setting (TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, Function 1.c) was affected and that NSPM would provide the TS changes in the future, and
- L-MT-09-047 (Reference 1-4) which supplemented the EPU with additional TS changes. One of the TS changes included in L-MT-09-047 involved TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, for Main Steam Line Flow – High (Function 1.c).

Issue

GEH issued a 10 CFR Part 21 Communication entitled "Error in Main Steam Line High Flow Calculational Methodology," SC 12-18, R1, issued on December 12, 2012 (Reference 1-5). The document indicated that GEH had discovered the potential for non-conservative values of the MSL Flow – High instrument setpoint, established from non-conservatively calculated values of the MSL choked flow rate. Further investigation of the issue revealed that the choices of input values that led to the previous non-conservative values of choked flow rate also led to overly-conservative values of associated flow-instrument pressure drop, which compensated for the non-conservatism in the MSL choked flow rate.

GEH updated the calculation technique used to evaluate the choked flow rate and the associated MSL flow-instrument pressure drop for the MNGP at Current Licensed Thermal Power (CLTP) conditions and at EPU conditions. The evaluation determined that the Analytical Limits for the MSL Flow – High instrument trip, as calculated for

CLTP and EPU conditions remain conservative with respect to MSL choked flow conditions.

The revised calculation model changes the relationship between MSL flow and flow-instrument pressure drop, and provides a higher instrument pressure drop value (in psid) for a given flow rate (in % rated flow), which accounts for the change in MSL high flow setpoint and setpoint margins. For this reason, the current values of % rated flow and MSL flow rate for the current Analytical Limit and Allowable Value no longer directly correspond to each other (although these current values can conservatively be used as they are, as explained below in the discussion of setpoint options).

Because the revised calculation method now results in lower values of flow rate corresponding to a given flow-instrument pressure drop (in psid), MNGP determined that changes were needed to the TS setpoint value to account for the error.

Revision to the Setpoint

Per GEH the existing setpoint Allowable Value and Analytical Limits are actually more conservative with respect to ensuring a trip well below choked flow considering the results from the new methodology. These setpoint values, expressed as differential pressures, are not being changed for EPU. However, L-MT-09-047 defined the EPU Allowable value for the MSL High Flow Main steam isolation valve (MSIV) isolation function as a percent of flow, vs. a differential pressure. This is consistent with the existing TS.

Due to the revised data from GEH regarding the flow element differential pressure vs. mass flow relationship, the setpoint requested for EPU (≤123.6% of EPU flow Allowable Value) is no longer valid. Per GEH, the instrument Allowable Value of ≤151.95 psid corresponds to ≤116.9% of rated EPU flow. Therefore a revision to the setpoint is required to change the Allowable Value for the MSL High Flow trip function from ≤123.6% to ≤116.9% of rated EPU steam flow.

Other Considerations

Because the current values of the MSL Flow – High instrument Analytical Limit and Allowable Value as expressed in psid are conservative with respect to the revised choked flow rate, those setpoint values in psid can be retained as they are. But because the revised calculation method now results in lower values of flow rate corresponding to a given flow-instrument pressure drop (in psid), the MNGP Allowable Value (TS value) requires revision based on the associated flow rate. An advantage to this approach is that it retains the existing flow-instrument setpoint values (in psid), and the MSL Flow – High instrument trip function would continue to operate as it did previously. Because the calculated flow corresponding to this setpoint is lower than previously assumed, this would ensure the mass releases for a main steam line break (MSLB) remain bounding. Therefore, no changes to the MSLB analyses are required.

Conclusion

The error correction used to support SC 12-18, R1, modifies the relationship between the instrument Allowable Value as expressed in psid and the % flow rate value stated in TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, for MSL Flow – High (Function 1.c). Therefore, it is necessary to change the TS value from 123.6% to 116.9%. However, the actual flow and psid values have not changed so other analyses are not affected.

See Enclosure 2 for mark ups to L-MT-09-026, L-MT-09-027 and L-MT-09-047. See Enclosure 3 for a proprietary copy of the GEH evaluation of SC 12-18. See Enclosure 4 for a non-proprietary copy of the GEH evaluation of SC 12-18 and NSPM calculation 05-75, Revision 1[1] that support the revised MSL Flow – High instrument setpoint.

References

1-1 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), "License Amendment Request: Extended Power Uprate (TAC MD9990)," L-MT-08-052, dated November 5, 2008. (ADAMS Accession No. ML083230111)

1-2 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), " Monticello Extended Power Uprate: Response to NRC Instrumentation & Controls Branch Request for Additional Information (RAI) dated March 11, 2009, and April 6, 2009, and Fire Protection Branch RAIs dated March 12, 2009 (TAC No. MD9990)," L-MT-09-026, dated May 13, 2009. (ADAMS Accession No. ML091410120)

1-3 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), " Monticello Extended Power Uprate: Response to Instrumentation and Controls Branch RAI No. 3 dated April 6, 2009 (TAC MD9990)," L-MT-09-027, dated August 19, 2009. (ADAMS Accession No. ML092320064)

1-4 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), "Supplement to Extended Power Uprate License Amendment Request: Revision to Proposed Technical Specification Changes in Response to Staff Comments (TAC MD9990)," L-MT-09-047, dated August 31, 2009. (ADAMS Accession No. ML092440171)

1-5 GEH 10 CFR Part 21 Communication, SC 12-18, "Error in Main Steam Line High Flow Calculational Methodology," Revision 1, dated December 12, 2012.

[1] Under L-MT-09-026 NSPM provided the NRC with calculation CA-95-075, Main Steam Line High Flow Setpoint, Revision 1. The NSPM calculation provided in Enclosure 4 to this letter also has the same number and revision number. Since the EPU change had never been approved by the NRC this calculation revision number was reissued to incorporate changes to address SC 12-18.

ITEM 2 - RADTRAD - 10 CFR 21 ERROR NOTIFICATION

NRC REQUESTED INFORMATION: NSPM was notified by a vendor that RADTRAD analyses contained error concerning use of deposition model for Alternative Source Term (AST) analyses. Provide a revised analysis description to NRC and provide new AST event values. Confirm X/Qs for events has not changed. Confirm no other changes were made to the Loss of Coolant Accident (LOCA) AST analysis.

NSPM RESPONSE:
On September 25, 2012, the RADTRAD Users Group members were notified of an error in Version 3.03 of the RADTRAD code. This code was used for MNGP in the application of the AST for post-accident dose consequence analyses.

The error reported by the RADTRAD Users Group results in a non-conservatism in the calculation of natural deposition effects inside the drywell after a LOCA. It was determined through test cases that the change in BWR doses was less than 0.1 Rem.

Revisions to the MNGP EPU LOCA dose consequence analyses are required to apply model changes that correct this code deficiency. No other accident analyses are affected by this RADTRAD error.

The following calculations are being revised. These calculations were provided for NRC review in References 2-1 and 2-2 (see also Reference 2-3 for additional TSC dose revision discussion and Reference 2-4 for final dose results).

- MNGP-003, "MNGP AST - LOCA Radiological Consequence Analysis", Rev 3 to be updated to Rev 4
- ALION-CAL-MNGP-4370-02, "MNGP EPU - CR and TSC Direct Dose," Rev 0 to be updated to Rev 1
- ALION-CAL-MNGP-4370-03, "MNGP EPU - TSC Internal Dose," Rev 1 to be updated to Rev 2

There is no change to the calculation inputs, including atmospheric dispersion coefficients (X/Qs). The only modeling change is in the RADTRAD software treatment of the Powers natural deposition model in the drywell. No other changes to the LOCA AST analysis have been made. Both inhalation and direct dose are affected for the Control Room and TSC.

The limiting dose cases for the MNGP LOCA analyses were reanalyzed using the model change discussed above. The results demonstrate that the LOCA dose increases less than 5 mrem TEDE in each case. These cases are being incorporated into the MNGP LOCA analyses.

Doses remain well within the limits of 10CFR50.67 and RG 1.183. The reported dose does not change as the increase is too small to be seen using two significant figures.

	Reported EPU Dose	Updated EPU Dose	Regulatory Limit (10CFR50.67 & RG 1.183)
Control Rm	3.80 Rem	3.80 Rem (increases 4 mrem or 0.1%)	5 Rem TEDE
EAB	1.46 Rem	1.46 Rem (increases 2 mrem or 0.1%)	25 Rem TEDE
LPZ	1.99 Rem	1.99 Rem (increases 1 mrem or 0.05%)	25 Rem TEDE
TSC	0.92 Rem	0.92 Rem (increases 2 mrem or 0.2%)	5 Rem TEDE

See Enclosure 2 for mark ups to L-MT-08-036, Enclosures 2, 5 and 6, L-MT-08-052, Enclosure 5 and L-MT-09-042, Enclosure 1. L-MT-08-052, Enclosure 4 is also impacted by this change; however, these markups are provided in the revised environmental assessment provided in Enclosure 5.

References

2-1 Letter from T J O'Connor (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate (USNRC TAC MD8398): Acceptance Review Supplement Regarding Radiological Analysis," L-MT-08-036, dated May 20, 2008. (ADAMS Accession No. ML081430494)

2-2 Letter from T J O'Connor (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate: Updates to Docketed Information (TAC MD9990)," L-MT-10-072, dated December 21, 2010. (ADAMS Accession No. ML103570026)

2-3 Letter from M A. Schimmel (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate (EPU): Supplement for Gap Analysis Updates (TAC MD9990)", L-MT-12-114, dated January 21, 2013.

2-4 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), "License Amendment Request: Extended Power Uprate (TAC MD9990)," L-MT-08-052, dated November 5, 2008. (ADAMS Accession No. ML083230111)

ITEM 3 - CONDENSER FREE VOLUME CHANGE

NRC REQUESTED INFORMATION: The first sentence on page 2-143 of L-MT-08-052, Enclosure 5, states that the condenser's use as a holdup volume is not impacted by EPU since it is not being modified. However, elsewhere in L-MT-08-052, Enclosure 5, it states that the condenser level will be increased for the new condensate pumps. Provide a discussion of revised calculation, including a table of changes. Indicate Loss of Coolant Accident (LOCA) is not affected. For steam jet air ejector (SJAE), identify changed assumptions, confirm other assumptions have not changed, and report the results. Also, provide a table of the assumptions being changed and why the regulatory limits are still met. Confirm no other changes have been made to the Control Rod Drop Accident (CRDA) Alternative Source Term (AST) analysis.

NSPM RESPONSE:
New condensate pumps being installed for EPU will require a higher operating hotwell level. The increase in hotwell level will decrease the available condenser free volume assumed in the design basis accident (DBA) CRDA radiological consequences analysis, resulting in a slight increase in dose for some CRDA cases.

This change in hotwell level does not affect any other DBA radiological dose analyses. The Loss of Coolant Accident (LOCA) analysis utilizes a condenser free volume that is based on condenser volume above the entry of the main steam drain line, which is well above the normal condenser hotwell level, and is therefore unaffected by an increased hotwell level. The other accidents (Fuel Handling Accident and Main Steam Line Break Accident) do not involve the condenser.

The CRDA accident analysis uses the condenser free volume to determine the radioisotope activity concentration in the condenser resulting from transport of the CRDA fuel damage activity to the condenser. The total amount of activity in the condenser available for release to the environment will not change; however, the activity concentration (activity per cubic foot) increases as the condenser free volume decreases.

The condenser free volume does not impact doses for release cases involving an isolated condenser which leaks at a volume fraction per day (1% volume per day), since the total activity in the condenser does not change.

The decrease in condenser free volume does impact release cases which involve a specified flow rate since increasing the activity concentration (activity per cubic foot) will result in higher amounts of activity released to the environment for a given flow rate. The affected cases are condenser release through the Mechanical Vacuum Pump (MVP) and SJAE via the offgas stack. The SJAE release case is the limiting case for the CRDA.

Calculation MNGP-005, "MNGP AST - CRDA Radiological Consequence Analysis," Rev 2, was updated in Rev 3 to incorporate the revised condenser free volume based on the new hotwell operating volume. Rev 2 was provided for NRC review in Reference 3-1 (incorporated as MNGP Calculation 04-040). No other inputs or assumptions were changed in the CRDA AST analysis. The limiting dose (SJAE release) increased approximately 2%. Doses remain well within the limits of 10CFR50.67 and Regulatory Guide 1.183.

	Reported EPU Dose	Updated EPU Dose	Regulatory Limit (10CFR50.67 & RG 1.183)
Control Rm	1.86 Rem	1.89 Rem	5 Rem TEDE
EAB	1.96 Rem	2.00 Rem	6.3 Rem TEDE
LPZ	0.90 Rem	0.91 Rem	6.3 Rem TEDE

See Enclosure 2 for mark ups to L-MT-08-036, Enclosure 3 and L-MT-08-052, Enclosure 5.

<u>References</u>

3-1 Letter from T J O'Connor (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate (USNRC TAC MD8398): Acceptance Review Supplement Regarding Radiological Analysis," L-MT-08-036, dated May 20, 2008. (ADAMS Accession No. ML081430494)

ITEM 4 - FEEDWATER TRANSIENT RESPONSE COMMITMENT CHANGE

NRC REQUESTED INFORMATION: A current NRC commitment for the EPU project states: *"NSPM will perform an analysis prior to EPU implementation to predict combined Condensate and Feedwater system performance for normal operation and for transients including Single Feedwater pump trip, Feedwater Control System Failure and Single Condensate Pump Trip. Acceptance criteria will include adequate margin to preclude loss of both reactor feedwater pumps from low suction pressure or flow."* This commitment is not complete at this time and NSPM wishes to revise the commitment.

At a meeting held between NSPM and NRC on November 20, 2012 the NRC agreed that commitment can be changed. NSPM will revise commitment and explain the results of our analyses in this area. NSPM will describe the basic strategy employed during Feedwater transients. NRC requested that NSPM assess BOP failures with this approach in terms of Probabilistic Risk Assessment (PRA) impact. This includes assessing the change in commitment for Feedwater/Condensate pump trips for impact on PRA.

NSPM RESPONSE:
In NSPM letter L-MT-09-046 (Reference 4-1), NSPM provided a supplement to the EPU LAR that included the following commitment.

> *NSPM will perform an analysis prior to RF025 to predict combined Condensate and Feedwater system performance for normal operation and for transients including Single Feedwater pump trip, Feedwater Control System Failure and Single Condensate Pump Trip. Acceptance criteria will include adequate margin to preclude loss of both reactor feedwater pumps from low suction pressure or flow.*

Subsequently, NSPM revised this commitment in letter L-MT-11-044 (Reference 4-2), to read as follows:

> *NSPM will perform an analysis prior to EPU implementation to predict combined Condensate and Feedwater system performance for normal operation and for transients including Single Feedwater pump trip, Feedwater Control System Failure and Single Condensate Pump Trip. Acceptance criteria will include adequate margin to preclude loss of both reactor feedwater pumps from low suction pressure or flow.*

NSPM has evaluated this commitment and has determined that a change is necessary. NSPM performed evaluations of events that could impact Condensate/Feedwater (CFW) flow availability during or after a transient. NSPM evaluated the following transient conditions.

- Single feedwater pump trip
- Single condensate pump
- Loss of 13.8kV Bus 11 or 12

- 2R to 1R transfer event
- Condensate demineralizer bypass valve opening transient analysis
- Steady state operation with feedwater regulating valves wide open (Runout)
- Feedwater pump recirculation valve fail open
- Feedwater pump cold starts
- Evaluation of condensate and feedwater pump hot start scenario

Of these events only the loss of a condensate pump and loss of Bus #11 or #12 will affect the availability of feedwater flow following the event. A discussion of these events is provided below.

Evaluation of Condensate/Feedwater Pump Transients
NSPM completed evaluation of Condensate and Feedwater pump transients using a dynamic CFW system model and other modeling techniques. The model provides an integrated plant response and includes the effects of the recirculation pump runback that automatically occurs following a single condensate pump or feedwater pump trip.

The model has shown that a single feedwater pump trip will not result in a loss of both reactor feedwater pumps at EPU and MELLLA+ conditions.

A separate sensitivity study has shown that the trip of a single condensate pump challenges the reliability of the feedwater system as the feedwater flow demand due to the large steam/feedwater flow mismatch is beyond the design capacity of the remaining (single) condensate pump. In this scenario, the remaining condensate pump will be in a sustained run out condition with unstable flow as the feedwater flow demand will be at maximum, and it is possible that both feedwater pumps will trip due to lack of sufficient suction pressure.

The mismatch between available pump flow and required reactor makeup will result in a reactor water level automatic scram irrespective of whether a single condensate pump is available, as the runback final power state point is approximately 70% power at EPU and approximately 80% of EPU power within the MELLLA+ operational domain, which is beyond the rated capacity of a single condensate pump.

The steam/feedwater mismatch cannot be significantly reduced by lowering the limit stop of the recirculation runback that automatically occurs following a single condensate pump trip, as the limit stop is constrained to prevent a post transient power/flow operating condition inside the stability exclusion region.

The MNGP CFW system does not have multi-pump redundancy and does not include backup condensate or condensate booster pumps that were included in later BWR designs. NSPM has confirmed that there are no design basis performance requirements for the MNGP recirculation pump runback with respect to preventing a reactor water low level scram or assuring the reliability of the feedwater system after a single condensate pump trip. The stability constraint and the integrated system design

is such that a reactor scram due to low reactor water level cannot be prevented without requiring the operator to reduce power with control rods very quickly.

It is not part of the MNGP design basis to demonstrate continued operation of a feedwater pump after a single condensate pump trip or to demonstrate that a reactor low level scram does not occur during this event. In addition, it is not prudent to require challenging operator actions to try to reduce steam/feedwater flow sufficiently in an effort to avoid a scram with control rod insertions. This operator action would have little safety benefit in the event of a single condensate pump trip from rated power.

Loss of Bus #11 or 12

The loss of Bus #11 or #12 will result in the loss of a reactor recirculation pump, a feedwater pump and a condensate pump. The event does not directly result in the initiation of reactor recirculation pump runback logic. The power level following a trip of one reactor recirculation system pump will be up to 77% under MELLLA+ operation with the highest possible rod line. This flow rate is beyond the capacity of the single remaining condensate pump and a low reactor water level automatic scram will result. The evaluation of feedwater availability requires the power level to be at or below 69% after the transient for feedwater flow to remain available through the event. Therefore, the loss of either bus #11 or #12 will result in the loss of feedwater flow.

It is not part of the MNGP design basis to demonstrate continued operation of a feedwater pump after a single condensate pump trip or to demonstrate that a reactor low level scram does not occur during this event.

Feedwater Control System Failure

Evaluations of failures of the feedwater level control system are completed as part of the transient analyses for each reload and were included in EPU analyses submitted to the NRC. See Reference 4-3, Enclosure 5, sections 2.4.1.2 and 2.8.5.1 for details. Each of these evaluations determined that the Feedwater control system failure is within the requirement of the current licensing basis following implementation of the EPU. The fuel design limits and reactor coolant pressure boundary limits previously evaluated under EPU conditions are not challenged by these events.

In addition, the EPU Startup Testing program includes the following steps to confirm the operational capability of the level control system (Reference 4-3, Enclosure 5, Section 2.12.1).

> *Control system tests will be performed for the reactor feedwater/reactor water level controls, pressure controls, and recirculation flow controls, if applicable. These operational tests will be made at the appropriate plant conditions for that test at each of the power increments, to show acceptable adjustments and operational capability.*

The analysis concluded that feedwater availability is maintained.

Conclusion
The analyses conclude that for most transient events feedwater availability is maintained. Based on the evaluation and operations experience described above, it is prudent to change operating procedures to require a manual scram following a single condensate pump trip from higher rod lines without reactor water level recovery, as this action lowers feedwater demand, enhances the reliability of the remaining condensate pump, and places the reactor in a stable and safe condition from which the operators can attempt to recover the CFW system if necessary.

Bus #11 or #12 failure evaluations were also completed. These evaluations indicate that EPU conditions will result in a loss of feedwater for this event.

For Feedwater Control System failures, previous evaluations determined that fuel design limits and reactor coolant pressure boundary limits will not be exceeded under EPU conditions and have not changed. The analysis concluded that feedwater availability is maintained.

In light of the conclusions above and the completed evaluations, NSPM is superseding the commitment included in L-MT-09-046 and L-MT-11-044 as cited above. The revised commitment is as follows:

> *Prior to EPU implementation NSPM will revise operating procedures for Condensate/Feedwater (CFW) transient events, to take prudent actions to recover CFW flow, and place the reactor in a safe and stable condition.*

No markups to EPU documentation are necessary based on the change of commitment.

Supplemental Risk Assessment Information
This item requests a change of commitment associated with operation of FW/Condensate after a transient on the system has occurred. The following assesses the effect the change in commitment will have on the MNGP PRA model.

Questions have been raised regarding feedwater system response following plant transients, including those initiated by a perturbation in the feedwater system itself. As this is a complicated question dependent on many variables such as initial power level, cause of the transient, feedwater level control response, status of feedwater support systems and human intervention, the PRA model has always made the assumption that both feedwater pumps will trip following any initiating event. This is a conservatism in the PRA model since several initiating events may not necessarily result in a trip of one or both feedwater pumps, and NSPM is attempting to make adjustments that will allow the feedwater system to remain on line when possible following plant trips.

The assumption is supported by some historic plant-specific post-transient experience, and requires that human intervention including starting a pump is always necessary to

reestablish high pressure feedwater flow to the reactor vessel. The MNGP PRA model continues to implement this conservative feature in its feedwater system assumptions. Restarting an electrically driven feedwater pump is a relatively simple action provided its support systems are functional and pump interlocks are satisfied. As human actions are virtually always necessary post transient to allow continued feedwater operation, even if a feedwater pump remains initially untripped, this assumption is not overly conservative.

References

4-1 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), " Monticello Extended Power Uprate: Response to NRC Balance of Plant Review Branch (SBPB) Request for Additional Information (RAI) dated March 23, 2009 (TAC No. MD9990)," L-MT-09-046, dated June 12, 2009. (ADAMS Accession No. ML091670410)

4-2 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), " Monticello Extended Power Uprate (EPU): Update on EPU Commitments (TAC MD9990)," L-MT-11-044, dated August 30, 2011. (ADAMS Accession No. ML11249A045)

4-3 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), "License Amendment Request: Extended Power Uprate (TAC MD9990)," L-MT-08-052, dated November 5, 2008. (ADAMS Accession No. ML083230111)

ITEM 5 - ENVIRONMENTAL ASSESSMENT (EA) CHANGES

NRC REQUESTED INFORMATION: Later Resource Plan and census data will impact the Environmental Assessment (EA) provided in L-MT-08-052, Enclosure 4. NRC requested some discussion of inputs that may have changed (e.g. land use, environmental justice, new endangered species, NPDES permit changes, etc.) or confirm that they did not change. Also look at the criteria in 10 CFR 51.92 for environmental impact statement changes. Provide some assessment of the issued EA performed by NRC and indicate that conclusions remain valid.

NSPM RESPONSE:
NSPM letter L-MT-08-052 (Reference 5-1), Enclosure 4 provided an EA of operation of the MNGP at EPU conditions. The EA was performed in 2008. NSPM supplemented the 2008 EA with letter L-MT-09-003 (Reference 5-2), Enclosure 1, which provided response to NRC Environmental Branch Requests for Additional Information in January 2009. NSPM has reviewed both the 2008 EA and the 2009 supplement to determine what information has changed since submittal of those documents. Enclosure 5 contains a revised EA that replaces L-MT-08-052, Enclosure 4 in its entirety. NSPM also included updates to data presented in the 2009 supplement when necessary, therefore, the data provided in L-MT-09-003 is also being replaced.

The revised 2008 EA contains a vertical line in the right-hand column to indicate places where our analysis has been updated using the most recent, available data[2]. Data not edited remains unchanged and continues to be valid. The results of these changes do not modify the overall conclusions of the EA, that there is minimal impact to the environment from the MNGP EPU.

NSPM also reviewed the EA and Finding of No Significant Impact (FONSI) published by the NRC on January 11, 2010 (Reference 5-3). Although some of the data presented in the NRC's EA and FONSI will be updated by the above-referenced edits to the 2008 EA and 2009 supplement, the NRC's conclusion that the proposed action (extended power uprate) will not have a significant effect on the quality of the human environment remains valid.

Per 10 CFR 50.92, the edits to the EA offered as part of the proposed amendment do not involve a significant increase in the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety.

See Enclosure 2 for mark ups to L-MT-08-052, Enclosure 4 and L-MT-09-003, Enclosure 1.

[2] Table 7.3.8-1 in the EA was updated to reflect the correct regulatory dose limits for a Fuel Handling Accident.

A revised copy of the Environmental Assessment is provided in Enclosure 5.

References

5-1 Letter from T J O'Connor (NSPM), to Document Control Desk (NRC), "License Amendment Request: Extended Power Uprate (TAC MD9990)," L-MT-08-052, dated November 5, 2008. (ADAMS Accession No. ML083230111)

5-2 Letter from T J O'Connor (NSPM) to Document Control Desk (NRC), "Response to NRC Environmental Branch Requests For Additional Information (RAIs) dated December 18, 2008 (TAC MD9990)," L-MT-09-003, dated January 29, 2009. (ADAMS Accession No. ML090300303)

5-3 Letter from P S Tam (NRC) to T J O'Connor (NSPM), "Subject: Monticello Nuclear Generating Plant (MNGP) – Final Environmental Assessment and Finding of No Significant Impact Related to the Proposed Extended Power Uprate (TAC No. MD9990)," dated January 11, 2010. (ADAMS Accession No. ML093220925)

ENCLOSURE 2

MARKED UP PAGE CHANGES TO EPU DOCUMENTATION BASED ON THE GAP ANALYSIS RESULTS

Item 1 – Markup to L-MT-09-026, Enclosure 1; L-MT-09-027, Enclosure 1; and L-MT-09-047, Enclosures 1, 2 and 3
Item 2 – Markup to L-MT-08-036, Enclosures 2, 5 and 6; L-MT-09-042, Enclosure 1; and L-MT-10-072, Enclosures 5 and 7
Item 3 – Markup to L-MT-08-036, Enclosure 3; and L-MT-08-052, Enclosure 5
Item 4 – No markup required.
Item 5 – Markup to L-MT-08-052, Enclosure 4, and L-MT-09-003, Enclosure 1

24 pages follow

Item 1

employs NEDC-31336P-A, Class 3, General Electric Instrument Setpoint Methodology, in determining instrumentation setpoints.

<table>
<tr><th>Item</th><th>Setpoint</th><th>Description/Basis</th></tr>
<tr><td>1</td><td>Main Steam Line Flow - High</td><td>
<table>
<tr><th colspan="5">Main Steamline Flow -High</th></tr>
<tr><th>Parameter</th><th>CLTP</th><th>Reference</th><th>EPU</th><th>Reference</th></tr>
<tr><td>AL</td><td>160.63 psid</td><td>CA-95-075 R0</td><td>165 psid</td><td>CA-95-075 R1</td></tr>
<tr><td>AV</td><td>159.5 psid</td><td>CA-95-075 R0</td><td>~~159.5~~ [151.95] psid</td><td>CA-95-075 R1</td></tr>
<tr><td>AV</td><td>142 %</td><td>CA-95-070 R0</td><td>~~123.64 % (round to 123.6%)~~ [116.9 %]</td><td>CA-95-075 R1</td></tr>
<tr><td>NTSP</td><td>143.0 psid</td><td>CA-95-075 R0</td><td>143.0 psid</td><td>CA-95-075 R1</td></tr>
</table>
CPPU Effect: Increased reactor power level and steam flow.
CPPU Basis: This setpoint is used to isolate the Group 1 primary containment isolation valves. The only safety analysis event that credits this trip is the main steamline break accident (MSLBA). The main steamline flow restrictor limits coolant lost through the break and the subsequent radioactive exposure.
The analytical limit for high main steamline flow isolation for EPU was raised slightly to account for error terms but was maintained well below the current rated steam flow for the flow restrictor in each main steam line. The main steamline high flow analytical limit is ~~~148~~ [138.4]% of CLTP steam flow or ~~~129~~ [120.5]% of uprated thermal power conditions which is well below the restrictor choke flow point specified as ~~3.227E6~~ [3.02E6] lb/hr or ~~154.9~~ [144.9]% of EPU rated steam flow per line. The MSL flow rate is monitored using differential pressure. MNGP has elected to maintain the Allowable Value and Nominal Trip Setpoints at the same absolute steam flow and differential pressure values as currently implemented.
The allowable value has been calculated to maintain the value at essentially the same absolute steam flow by calculating the new value of percent steam flow at EPU conditions that provides the same differential pressure (151.95 psid) across the flow sensors as the current AV.
</td></tr>
</table>

Item 1

ENCLOSURE 1

ATTACHMENT 1

CALCULATIONS

CA-95-073, REV. 4 - REACTOR LOW WATER LEVEL SCRAM SETPOINT

~~**CA-95-075, REV. 1 - MAIN STEAM LINE HIGH FLOW SETPOINT**~~ Document Superseded

CA-96-054, REV. 5 - TURBINE STOP VALVE CLOSE/GENERATOR LOAD REJECT SCRAM BYPASS

CA-08-050, REV. 0 – INSTRUMENT SETPOINT CALCULATION – AVERAGE POWER RANGE MONITOR (APRM) NON-FLOW BIASED PRNM SETPOINTS FOR CLTP and EPU

- ATTACHMENT 3 - AVERAGE POWER RANGE MONITOR SELECTED PRNM LICENSING SETPOINTS EPU OPERATION (NUMAC)

Item 1

This document has been superseded. This document is no longer applicable to the MNGP EPU.

ISSUE SUMMARY
Form SOP-0402-07, Revision 7B

DESIGN CONTROL SUMMARY

CLIENT: Northern States Power Company — UNIT NO.: 1 — Page No.: 1

PROJECT NAME: **Monticello Nuclear Generating Plant**

PROJECT NO.: 11972-049 — ☒ NUCLEAR SAFETY- RELATED

CALC. NO.: CA-95-075, Revision 1 — ☐ NOT NUCLEAR SAFETY-RELATED

TITLE: Main Steam Line High Flow Setpoint

EQUIPMENT NO.: DPIS-2-116/7/8/9 A,B,C&D

IDENTIFICATION OF PAGES ADDED/REVISED/SUPERSEDED/VOIDED & REVIEW METHOD

This revision completely supersedes Revision 0

INPUTS/ ASSUMPTIONS
☒ VERIFIED
☐ UNVERIFIED

REVIEW METHOD:	Detailed	REV.	1
STATUS:	Approved	DATE FOR REV.:	12/18/2008
PREPARER	Nicholas Torres / Eric Kolodziejczyk	DATE:	12/18/2008
REVIEWER	John O'Hara / Greg Rainey	DATE:	12/18/2008
APPROVER	Steven Malak	DATE:	12/18/2008

IDENTIFICATION OF PAGES ADDED/REVISED/SUPERSEDED/VOIDED & REVIEW METHOD

INPUTS/ ASSUMPTIONS
☐ VERIFIED
☐ UNVERIFIED

REVIEW METHOD:		REV.	
STATUS:		DATE FOR REV.:	
PREPARER		DATE:	
REVIEWER		DATE:	
APPROVER		DATE:	

IDENTIFICATION OF PAGES ADDED/REVISED/SUPERSEDED/VOIDED & REVIEW METHOD

INPUTS/ ASSUMPTIONS
☐ VERIFIED
☐ UNVERIFIED

REVIEW METHOD:		REV.	
STATUS:		DATE FOR REV.:	
PREPARER		DATE:	
REVIEWER		DATE:	
APPROVER		DATE:	

NOTE: PRINT AND SIGN IN THE SIGNATURE AREAS

Item 1

> In addressing the setpoint methodology issues, the licensee identified TS Table 3.3.1.1-1, Function 2.a, "APRM Neutron Flux-High (Setdown), "Function 2.b, "APRM Simulated Thermal Power – High," and Function 2.f, "OPRM Upscale," as functions that are not LSSS SL-related. The NRC staff agrees with the licensee's determination that the above functions are not LSSS.

Therefore, in accordance with the plant-specific analysis provided by the NSPM as approved by the NRC Safety Evaluation for the PRNMS amendment, the NSPM is not proposing TSTF-493 style footnotes for the APRM Simulated Thermal Power – High function.

The second allowable value change involved a change to the Main Steam Line Flow – High function. It was identified that Function 1.c within TS Table 3.3.6.1-1, "Primary Containment Isolation Valves," which provides isolation of the Main Steam Lines on high flow, should also have been revised as part of the EPU license amendment request as a function requiring a change to the associated allowable value. The allowable value for Function 1.c within TS Table 3.3.6.1-1 will be revised as follows:

	Current Allowable Value	Proposed Allowable Value
Function 1.c, Main Steam Line Flow – High	142 percent	~~123.6~~ 116.9 percent

The revision to the allowable value for Function 1.c will be provided to the NRC in a separate letter.

Attachment A to Reference 2, "Identification of Functions to be Annotated with the TSTF-493 Footnotes," provides the disposition of Functions to be included in TSTF-493. As stated in Reference 2:

> The indicated generic dispositions were discussed with the NRC in a teleconference held on February 11, 2009 and the NRC staff agreed that the Attachment indicates those functions applicable to all licensees for which no plant-specific analysis is required.

The Main Steam Line Flow – High function (Function 1.c) in TS Table 3.3.6.1-1 is not included in the list of functions contained in Attachment A (see section for NUREG-1433, Boiling Water Reactor / 4 Plants) and hence application of the interim TSTF-493 style footnotes is not required nor is proposed for this function by the NSPM.

Conclusion

In accordance with the NRC Safety Evaluation for the PRNMS license amendment, the NSPM is not adopting interim TSTF-493 footnotes for the APRM Simulated Thermal

Item 1

3.0 ANALYSIS OF THE PROPOSED CHANGES

3.1 Main Steam Line Flow – High (Function 1.c) of TS Table 3.3.6.1-1

This change revises the Allowable Value in TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, for the Main Steam Line Flow – High (Function 1.c), from ≤ 142 % rated steam flow to ≤ ~~123.6~~ 116.9 % rated steam flow.

By letter dated May 13, 2009 (Reference 2), NSPM identified two errors with the Main Steam Line Flow - High isolation Allowable Value in the EPU documentation.

1. The entry for Main Steam Line (MSL) isolation on high flow in PUSAR(1) Table 2.4-1 was incorrectly labeled as an Analytical Limit (AL) instead of an Allowable Value (AV), and the associated EPU AV had been transposed incorrectly from PUSAR page 2-102.

2. The associated TS changes to the AV for the Main Steam Line (MSL) isolation on high flow function had been evaluated but the affected TS pages had inadvertently been omitted from the submittal.

NSPM also indicated that the above changes would be submitted by a supplemental letter. Accordingly, the associated TS changes are included in Enclosure 3. A change to Table 1 of Enclosure 1 of the EPU License Amendment request is also included in Enclosure 2. This table provides the description and basis for the TS change. In addition, the NSPM is providing a marked up PUSAR page to correct the error in item 1 above in Enclosure 2.

The associated TS change represents a correction to an omission made by NSPM in the EPU LAR. The basis for this change has been previously provided and is described in detail in the following docketed correspondences.

- Section 2.4.1.3 of the PUSAR(1)

- NSPM response to EICB RAI Question 1 (Reference 2). Please see Item 1, Main Steam High Flow, in the table included in the response to this question.

- MNGP Calculation CA-95-075 Rev. 1, Main Steam Line High Flow Setpoint, which was provided within Enclosure ~~1~~ 3 of ~~Reference 2~~ L-MT-13-020.

1. The PUSAR was provided as Enclosure 5 to letter L-MT-08-052 (Reference 1).

Item 1

Table 1 Monticello Proposed Operating License and Technical Specification Changes		
TS Section	**Description of Change**	**Basis for Change**
3.3.1.1, RPS Instrumentation SR 3.3.1.1.6	Revise the frequency from 2000 EFPH to 1000 MWD/T average core exposure	Revises the frequency to conform to the BWR4 Standard Technical Specification value for this surveillance requirement.
Table 3.3.6.1-1 Function 1.c	Revise the Allowable Value (AV) from ≤ 142% to ≤ ~~123.6~~ 116.9%	Revises the value to reflect the relative change due to the change in rated steam flow at EPU. The differential pressure value across the flow sensors for the EPU AV is the same as that for CLTP. The analytical limit for high main steamline flow isolation for EPU was raised slightly to account for error terms but was maintained well below the steam flow for the flow restrictor in each main steam line. The main steamline high flow analytical limit is ~~~129~~ 120.5% which is well below the restrictor choke flow point specified ~~as~~ ~~3.227E6~~ 3.02E6 lb/hr or ~~154.9~~ 144.9% of EPU rated steam flow per line.
3.5.1 ECCS Operating	Clarifies the format	Editorial correction in response to NRC Review Branch comment

Item 1

MARKUP OF TABLE 2.4-1 of ENCLOSURE 7
of the
MONTICELLO EPU LICENSE AMENDMENT REQUEST
DATED NOVEMBER 5, 2008

Table 2.4-1 Analytical Limits and Allowable Values for Setpoints

Parameter	Current	EPU
APRM Calibration Basis (MWt)	1775	2004
APRM Neutron Flux High Scram AL	125	No Change
APRM STP (Scram) AVs[1,2]		
TLO (%RTP)	0.66W + 61.6	0.55W + 61.5
SLO (%RTP)	0.66(W-delta W) + 61.6	0.55(W-delta W) + 61.5
Clamp (%RTP)	116	No Change
APRM STP (Rod Block) AVs[1,2]		
TLO (%RTP)	0.66W + 55.6	0.55W + 55.5
SLO (%RTP)	0.66(W-delta W) + 55.6	0.55(W-delta W) + 55.5
Clamp (%RTP)	110	No Change
APRM Setdown in Startup Mode AVs		
Scram (%RTP)	20	No Change
Rod Block (%RTP)	15	No Change
Rod Block Monitor AVs	See note 3	No Change
Rod Worth Minimizer LPSP AV (%RTP)	10	No Change
Main Steam Line High Flow Isolation ~~AL~~ AV (% rated steam flow)	142	~~123.5~~ ~~123.6~~ 116.9
Turbine First-Stage Pressure Scram Bypass AL (%RTP)	45.0%	40.0%
Reactor Water Level – Low (SCRAM) (inches above indicated zero) (AL)	0	-2.5

Notes:

1. No credit is taken in any safety analysis for the flow referenced setpoints.
2. The EPU APRM STP Scram and Rod Block clamps remain the same in terms of percent rated power.
3. The cycle specific reload analysis is used to determine any change in the rod block trip setpoint. The RBM trip setpoints listed are based on an Operating Limit Minimum Critical Power Ratio (OLMCPR) of 1.30.

Item 1

Table 3.3.6.1-1 (page 1 of 3)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level - Low Low	1, 2, 3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ -48 inches
b. Main Steam Line Pressure - Low	1	2	E	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≥ 815 psig
c. Main Steam Line Flow - High	1, 2, 3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ ~~142~~ 123.6 116.9% rated steam flow
d. Main Steam Line Tunnel Temperature - High	1, 2, 3	2 per trip string	D	SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 209°F
2. Primary Containment Isolation					
a. Reactor Vessel Water Level - Low	1, 2, 3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 7 inches
b. Drywell Pressure - High	1, 2, 3	2	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 2.0 psig
3. High Pressure Coolant Injection (HPCI) System Isolation					
a. HPCI Steam Line Flow - High	1, 2, 3	2	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 300,000 lb/hour with ≤ 5.58 second time delay

Item 2

Enclosure 2 to L-MT-08-036

MNGP-003, "MNGP AST - LOCA Radiological Consequence Analysis", Rev 3

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

Item 2

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

ALION
SCIENCE AND TECHNOLOGY

DESIGN CALCULATION AND ANALYSIS COVER PAGE

Calculation No: MNGP-003	Revision: 3	Page 1 of 95
Calculation Title: MNGP AST – LOCA Radiological Consequence Analysis		
Project No: 264-4370		
Project Name: Monticello Nuclear Generating Plant Extended Power Uprate (EPU) Project		
Client: Nuclear Management Company		
Document Purpose/Summary: The purpose of this calculation revision is to determine the dose to the control room operator and to a person at the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ) at the Monticello Nuclear Generating Plant (MNGP) site following a design basis Loss of Coolant Accident (LOCA). This analysis revision is performed based on plant operation at 102% of the Extended Power Uprate (EPU) power level of 2004 MWth using the Alternative Source Term (AST) in accordance with the guidance provided by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.183 (July 2000) and as allowed by 10 CFR 50.67 and replaces the estimated EPU dose analysis previously performed in calculation Revision 2. All calculated doses are shown to be below the regulatory limits for all three specified locations.		
All software used in the preparation of this calculation meets QAP 3.5, *Use of Computer Software and Error Reporting* requirements. Preparer Signature:__________ Date:______		

DESIGN VERIFICATION METHOD	QA APPLICABILITY LEVEL
☒ Design Review	☒ Nuclear Safety Related
☐ Alternative Calculation	☐ Quality Significant
☐ Qualification Testing	☐ Nuclear Non-Safety Related

Professional Engineer Approval (if required) ______ Not Required (Signature) Date______

	Printed/Typed Name	Signature	Date
Prepared By:	R. E. Anderson	RE Anderson	1/07/08
Reviewed By:	D. M. Hindera	J. M. Cajigas for DMH	01/07/08
Approved By:	J. M. Cajigas	J. M. Cajigas	01/07/08

Form 3.4.1
Revision 3
Effective Date: 2/28/07

Item 2

Enclosure 5 to L-MT-08-036

ALION-CAL-MNGP-4370-02, "MNGP EPU - CR and TSC Direct Dose," Rev 0

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

Item 2

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

ALION
SCIENCE AND TECHNOLOGY

DESIGN CALCULATION AND ANALYSIS COVER PAGE

Calculation No: ALION-CAL-MNGP-4370-02	Revision: 0	Page 1 of 26
Calculation Title: MNGP EPU – CR & TSC Direct Dose		
Project No: 264-4370		
Project Name: Monticello Nuclear Generating Plant Extended Power Uprate (EPU) Project		
Client: Nuclear Management Company		

Document Purpose/Summary: The purpose of this calculation is to determine the direct dose contribution to the control room (CR) and technical support center (TSC) operators at the Monticello Nuclear Generating Plant (MNGP) site following a design basis loss of cooling accident (LOCA). The analysis is performed based on plant operation at 102% of the Extended Power Uprate (EPU) power level of 2004 MWth using the Alternative Source Term (AST) in accordance with the guidance provided by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.183 (July 2000) and as allowed by 10 CFR 50.67. All calculated doses are shown to be below the regulatory limits for each specified locations.

All software used in the preparation of this calculation meets QAP 3.5, *Use of Computer Software and Error Reporting* requirements.

Preparer Signature: Not Required Date:

DESIGN VERIFICATION METHOD	QA APPLICABILITY LEVEL
☒ Design Review	☒ Nuclear Safety Related
☐ Alternative Calculation	☐ Quality Significant
☐ Qualification Testing	☐ Nuclear Non-Safety Related

Professional Engineer Approval (if required) Not Required (Signature) Date

	Printed/Typed Name	Signature	Date
Prepared By:	R. E. Anderson	R E Anderson	1/07/08
Reviewed By:	D. M. Hindera	J. M. Cajigas for DMH	01/07/08
Approved By:	J. M. Cajigas	J. M. Cajigas	01/07/08

Form 3.4.1
Revision 3
Effective Date: 2/28/07

Item 2

Enclosure 6 to L-MT-08-036

ALION-CAL-MNGP-4370-03, "MNGP EPU - TSC Internal Dose," Rev 0

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

Item 2

This calculation has been superseded.
See L-MT-13-020, Item 2 for the revised results.

ALION SCIENCE AND TECHNOLOGY

DESIGN CALCULATION AND ANALYSIS COVER PAGE

Calculation No: ALION-CAL-MNGP-4370-03	Revision: 0	Page 1 of 20
Calculation Title: MNGP EPU – TSC Internal Dose		
Project No: 264-4370		
Project Name: Monticello Nuclear Generating Plant Extended Power Uprate (EPU) Project		
Client: Nuclear Management Company		

Document Purpose/Summary: The purpose of this calculation is to determine the internal cloud dose contribution to the technical support center (TSC) operators at the Monticello Nuclear Generating Plant (MNGP) site following a design basis loss of cooling accident (LOCA). The analysis is performed based on plant operation at 102% of the Extended Power Uprate (EPU) power level of 2004 MWth using the Alternative Source Term (AST) in accordance with the guidance provided by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.183 (July 2000) and as allowed by 10 CFR 50.67. All calculated doses are shown to be below the regulatory limits for each specified locations.

All software used in the preparation of this calculation meets QAP 3.5, *Use of Computer Software and Error Reporting* requirements.

Preparer Signature: Not Required Date:

DESIGN VERIFICATION METHOD	QA APPLICABILITY LEVEL
☒ Design Review	☒ Nuclear Safety Related
☐ Alternative Calculation	☐ Quality Significant
☐ Qualification Testing	☐ Nuclear Non-Safety Related

Professional Engineer Approval (if required) Not Required (Signature) Date

	Printed/Typed Name	Signature	Date
Prepared By:	R. E. Anderson	R E Anderson	1/07/08
Reviewed By:	D. M. Hindera	J. M. Cajigas for DMH	01/07/08
Approved By:	J. M. Cajigas	J. M. Cajigas	01/07/08

Form 3.4.1
Revision 3
Effective Date: 2/28/07

Item 2

NRC RAI No. 4

The Safety Analysis Report for the Monticello Constant Power Uprate, dated October 2008, on page 2-340, within Table 2.9-1, indicates the dose consequences in the Control Room and the Technical Support Center, from a design-basis loss-of-coolant accident under EPU conditions, as 3.80 rem and 0.83 rem, respectively. Verify that these results include direct radiation exposure from plant systems containing the accident source term, consistent with the assumptions in NUREG-0737, item II.B.2. If not, demonstrate that the direct radiation dose rates for these two vital areas meet the GDC-19 dose criteria, as specified in NUREG-0737, item II.B.2.

NSPM RESPONSE

The Control Room and Technical Support Center (TSC) total calculated doses include a component due to direct shine dose from plant systems and the reactor building as required by NUREG-0737 Item II.B.2. The shine contribution for the Control Room is 0.771 Rem of the total 3.8 Rem and the TSC is 0.0939 Rem of the total 0.92 Rem.

(+ 2 mrem)

Item 2

[redacted]

Table 2.9-1 LOCA Radiological Consequences

	TEDE Dose (REM)			
	Receptor Location			
	CR	EAB	LPZ	TSC
Calculated Dose CLTP[1]	3.40	1.31	1.72	0.854
Calculated Dose EPU[2]	3.80	1.46	1.99	0.92
Allowable TEDE Limit[3]	5	25	25	5

+ 4 mrem + 2 mrem + 1 mrem + 2 mrem

Table 2.9-2 FHA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	4.29	1.61	0.31
Calculated Dose EPU[2]	4.67	1.74	0.34
Allowable TEDE Limit[3]	5	6.3	6.3

Table 2.9-3 CRDA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	1.70	1.73	0.79
Calculated Dose EPU[2]	1.86	1.96	0.90
Allowable TEDE Limit[3]	5	6.3	6.3

Tables 2.9-1, 2.9-2 and 2.9-3 notes:

1. CLTP Power Level Assumption = 1880 MWt x 1.02 = 1918 MWt
2. EPU power Level Assumption = 2004 MWt x 1.02 = 2044 MWt
3. RG 1.183 Table 6

Item 2

Table 2.9-1 LOCA Radiological Consequences

	TEDE Dose (REM)			
	Receptor Location			
	CR	EAB	LPZ	TSC
Calculated Dose CLTP[1]	3.40	1.31	1.72	0.854
Calculated Dose EPU[2]	3.80	1.46	1.99	0.92
Allowable TEDE Limit[3]	5	25	25	5

+ 4 mrem + 2 mrem + 1 mrem + 2 mrem

Table 2.9-2 FHA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	4.29	1.61	0.31
Calculated Dose EPU[2]	4.67	1.74	0.34
Allowable TEDE Limit[3]	5	6.3	6.3

Table 2.9-3 CRDA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	1.70	1.73	0.79
Calculated Dose EPU[2]	1.86	1.96	0.90
Allowable TEDE Limit[3]	5	6.3	6.3

Tables 2.9-1, 2.9-2 and 2.9-3 notes:

1. CLTP Power Level Assumption = 1880 MWt x 1.02 = 1918 MWt
2. EPU power Level Assumption = 2004 MWt x 1.02 = 2044 MWt
3. RG 1.183 Table 6

Item 3

Enclosure 3 to L-MT-08-036

MNGP-005, "MNGP AST - CRDA Radiological Consequence Analysis," Rev 2

This calculation has been superseded.
See L-MT-13-020, Item 3 for the revised results.

Item 3

This calculation has been superseded.
See L-MT-13-020, Item 3 for the revised results.

ALION SCIENCE AND TECHNOLOGY

DESIGN CALCULATION AND ANALYSIS COVER PAGE

Calculation No: MNGP-005	Revision: 2	Page 1 of 63
Calculation Title: MNGP AST – CRDA Radiological Consequence Analysis		
Project No: 264-4370		
Project Name: Monticello Nuclear Generating Plant Extended Power Uprate (EPU) Project		
Client: Nuclear Management Company		

Document Purpose/Summary: The purpose of this calculation is to determine the dose to the control room operator and to a person at the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ) at the Monticello Nuclear Generating Plant (MNGP) site following a design basis Control Rod Drop Accident (CRDA). The analysis is performed based on plant operation at 102% of the Extended Power Uprate (EPU) power level of 2004 MWth using the Alternative Source Term (AST) in accordance with the guidance provided by the Nuclear Regulatory Commission (NRC) in Regulatory Guide 1.183 (July 2000) and as allowed by 10 CFR 50.67. All calculated doses are shown to be below the regulatory limits for all three specified locations.

All software used in the preparation of this calculation meets QAP 3.5, *Use of Computer Software and Error Reporting* requirements.

Preparer Signature: J.M. Cajigas for D.M. Hindera Date: 12-21-07

DESIGN VERIFICATION METHOD	QA APPLICABILITY LEVEL
☒ Design Review	☒ Nuclear Safety Related
☐ Alternative Calculation	☐ Quality Significant
☐ Qualification Testing	☐ Nuclear Non-Safety Related

Professional Engineer Approval (if required) Not Required (Signature) Date

	Printed/Typed Name	Signature	Date
Prepared By:	D. M. Hindera	J.M. Cajigas for DMH	12-21-07
Reviewed By:	R. E. Anderson	RE Anderson	12-21-07
Approved By:	J. M. Cajigas	J.M. Cajigas	12-21-07

Form 3.4.1
Revision 3
Effective Date: 2/28/07

Item 3

Table 2.9-1 LOCA Radiological Consequences

	TEDE Dose (REM)			
	Receptor Location			
	CR	EAB	LPZ	TSC
Calculated Dose CLTP[1]	3.40	1.31	1.72	0.77
Calculated Dose EPU[2]	3.80	1.46	1.99	0.83
Allowable TEDE Limit[3]	5	25	25	5

Table 2.9-2 FHA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	4.29	1.61	0.31
Calculated Dose EPU[2]	4.67	1.74	0.34
Allowable TEDE Limit[3]	5	6.3	6.3

Table 2.9-3 CRDA Radiological Consequences

	TEDE Dose (REM)		
	Receptor Location		
	CR	EAB	LPZ
Calculated Dose CLTP[1]	1.70	1.73	0.79
Calculated Dose EPU[2]	~~1.86~~ 1.89	~~1.96~~ 2.00	~~0.90~~ 0.91
Allowable TEDE Limit[3]	5	6.3	6.3

Tables 2.9-1, 2.9-2 and 2.9-3 notes:

1. CLTP Power Level Assumption = 1880 MWt x 1.02 = 1918 MWt
2. EPU power Level Assumption = 2004 MWt x 1.02 = 2044 MWt
3. RG 1.183 Table 6

Item 5

Enclosure 4 to L-MT-08-052

MNGP Extended Power Uprate Environmental Assessment

This Environmental Assessment has been superseded. See NSPM letter L-MT-13-020, Enclosure 4 for the revised Environmental Assessment.

Item 5

ENCLOSURE 4

MNGP EXTENDED POWER UPRATE ENVIRONMENTAL ASSESSMENT

NOVEMBER 2008

This Environmental Assessment has been superseded. See NSPM letter L-MT-13-020, Enclosure 4 for the revised Environmental Assessment.

NORTHERN STATES POWER COMPANY, A MINNESOTA CORPORATION (NSPM)

MONTICELLO NUCLEAR GENERATING PLANT

MONTICELLO, MINNESOTA

RENEWED LICENSE NO. DPR-22

DOCKET NO. 50-263

Item 5

ENCLOSURE 1

MONTICELLO NUCLEAR GENERATING PLANT

NSPM Response To Environmental Branch RAIs dated December 18, 2008

The responses to these RAIs have been superseded, revised or augmented. See NSPM letter L-MT-13-020, Enclosure 4 for the revised Environmental Assessment which supersedes, revises or augments the responses to these RAIs.

Item 5

NSPM Response To Environmental Branch RAIs dated December 18, 2008

The responses to these RAIs have been superseded, revised or augmented. See NSPM letter L-MT-13-020, Enclosure 4 for the revised Environmental Assessment which supersedes, revises or augments the responses to these RAIs.

Withdrawn during December 16, 2008 conference call.

NRC Review Item (2)

Please provide additional information or clarification of the potential increase in water consumption with the uprate. The description of water use in the EA should be made clearer. Specifically, the consumptive use during current operations assuming 130 days per year of cooling tower use is 7800 acre-feet/year. With the power uprate and an increase in cooling tower use to 150 days, the estimated consumptive use is 7700 acre-feet/year, a reduction. This is counterintuitive and needs either a correction or a detailed explanation.

NSPM Response

Section 6.2.2 of Enclosure 4 to Reference 1 discusses this issue. This section states:

> *Currently, the surface water consumption due to open cycle evaporative losses and cooling tower evaporation and drift is estimated at approximately 6,800 acre-ft/year assuming 130 days of cooling tower operation, 235 days of open-cycle operation and nominal values of cooling tower flow (approximately 509 cubic feet/second). Using the maximum surface water appropriation limit of 645 cubic feet/second as the cooling tower flow value results in an estimated total consumption of 7,800-acre-ft/year.*
>
> *For extended power uprate, assuming an increase in open cycle consumption of 20 percent, an increase in days of cooling tower operation to 150 days/year, and nominal values of cooling tower flow, results in an estimated consumption of 7,700 acre-ft/year. Using the maximum surface water appropriation limit of 645 cubic feet/second as the cooling tower flow value results in an estimated total consumption of approximately 8,700 acre-ft/year. Note that using the appropriation limit for cooling tower flow is very conservative because the cooling towers are typically operated in "Helper" mode (i.e., not all circulating water flow is passed over the cooling towers).*

The first paragraph quoted above discusses expected consumptive use under current licensed thermal power of 1775 MWt. This recognizes that the NPDES permit requires cooling tower operation to meet specified discharge canal temperature limits. NPDES permit limits are a maximum daily average discharge canal temperature of 95°F during the months of April through October, 85°F in November and March, and 80°F in December through February. This has historically required about 130 days of cooling tower operation per year which is expected to increase to 150 days per year with higher heat loads associated with extended power uprate. Additionally, the nominal consumptive use discussed in the first sentence of the first quoted paragraph recognizes that while the water appropriation limit is 645 cubic feet/second the circulation water system capacity is less than this value and the cooling tower capacity is normally insufficient to process all circulating

ENCLOSURE 4

ANALYSES TO SUPPORT MAIN STEAM LINE HIGH FLOW TRIP REVISED TECHNICAL SPECIFICATION SETPOINT

This enclosure contains the following documents as referenced from Item 1 in Enclosure 1

- General Electric – Hitachi Report GE-MNGP-AEP-3263, Enclosure 2, Effect of GEH 10 CFR Part 21 Communication entitled "Error in Main Steam Line High Flow Calculational Methodology at Monticello Nuclear Generation Plant"– 4 pages
- NSPM Calculation 95-075, Revision 1 – 188 pages – NOTE: Attachment 10 to this calculation is redacted as it contains GEH proprietary information.

192 pages follow

ENCLOSURE 2

GE-MNGP-AEP-3263

Effect of GEH 10 CFR Part 21 Communication entitled "Error in Main Steam Line High Flow Calculational Methodology at Monticello Nuclear Generation Plant"

Non-Proprietary Information – Class I (Public)

NON-PROPRIETARY NOTICE

This is a non-proprietary version of Enclosure 1 of GE-MNGP-AEP-3263, which has the proprietary information removed. Portions of the document that have been removed are indicated by an open and closed bracket as shown here [[ ]].

Background

In December 13, 2012 Letter to Northern States Power Company of Minnesota [ML12338A006], the NRC provided comments on presentations Monticello had made on their gap analysis of changes to information previously submitted in Extended Power Uprate (EPU) License Amendment Request. This is the GEH response to the Nuclear Regulatory Commission (NRC) comment on the Main Steam Line (MSL) High Flow Trip.

GEH Response

GEH has evaluated the Monticello Nuclear Generating Plant (MNGP) for implications of the choked flow rate issue described most recently in the GEH 10 CFR Part 21 Communication entitled "Error in Main Steam Line High Flow Calculational Methodology," Safety Communication (SC) 12-18 Revision 2 and MFN 12-111 Revision 2, February 8, 2013. (SC 12-18 Revision 2 contains MFN 12-111 Revision 2, and both documents were issued to update affected licensees and the NRC, respectively, on the closure of the GEH Part 21 evaluation, the status of which had been previously communicated with the 60-day Interim Report Notification in SC 12-18 Revision 1 and MFN 12-111 Revision 1 on December 12, 2012). To address this issue, GEH established a new, more-accurate calculation method for MSL two-phase steam flow, [[ ]]. This updated calculation was used to evaluate the choked flow rate and the associated MSL flow-instrument pressure drop for MNGP at Current Licensed Thermal Power (CLTP) conditions and at EPU conditions.

The evaluation has determined that the Analytical Limit (AL) for the MSL Flow – High instrument trip, as calculated for CLTP and EPU conditions and communicated to GEH in Xcel Energy Design Information Transmittal (DIT) 13638-24, remains conservative with respect to MSL choked flow conditions. In fact, the Analytical Limit [[ ]] has considerably more margin to the choked flow condition than the GEH recommended margin, as shown in the bottom two lines of Table 1 (i.e., the current margin is greater than the revised minimum margin recommended by GEH). This determination is applicable for the rated dome pressure of 1025 psia and also for off-rated dome pressure values down to 965 psia. (Dome pressure of 965 psia has been used in the MNGP Updated Safety Analysis Report MSL Break analysis.)

Specific values determined for 965 psia and 1025 psia dome pressure, including comparison of the flow-instrument pressure drop currently used as the MSL Flow – High Analytical Limit, are provided in Table 1.

Please note that the revised calculation model changes the relationship between MSL flow and flow-instrument pressure drop, and provides [[ ]], which could impact the MSL high flow setpoint and

setpoint margins. For this reason, the current values of % rated flow and MSL flow rate for the current Analytical Limit and Allowable Value no longer directly correspond to each other. However, these current values can conservatively be used as they are, and the current documented values of the AL in % of rated flow and the AV in psid remain conservative.

The revised values of flow rate (in % of rated EPU flow) that will produce the current flow-instrument pressure drop values (in psid) are provided in Table 2 below. Note that in this table the flow rates associated with current flow-instrument pressure drop values were determined [[
]] from the updated calculation.

The spurious trip margin for the MSL high-flow instrumentation should be calculated [[

]]

Conclusion

GEH has determined, based on results from a revised and more accurate calculation of MSL flow and flow-instrument pressure drop that the condition described in SC 12-18, Revision 1 has no impact on the function of the MSL Flow – High instrument trip at reactor dome pressure of 965 psia and above. For these conditions, the flow-instrument trip, with its current setpoints, will actuate the trip function prior to attaining choked flow in the MSL.

Table 1 - Revised Values of Choked Flow Rate

Dome Pressure	965 psia		1025 psia	
Operating Conditions	**CLTP**	**EPU**	**CLTP**	**EPU**
Choked Flow Rate (Mlb_m/hr)	2.84	2.84	3.02	3.02
Choked Flow Rate (% Rated Flow)	156.3	136.2	166.3	144.9
Flow Instrument Pressure Drop at Choked Conditions (psid)	369.4	369.4	391.2	391.2
Current MSL Flow – High Analytical Limit (psid) per DIT 13638-24	160.63	165	160.63	165
GEH Recommended Choked Flow-to-AL Flow Margin (psid)	[[			]]
Current MSL Choked Flow-to-AL Flow Margin (psid)	208.77	204.4	230.57	226.2

Table 2 - Revised Flow Rates Corresponding to Current MNGP Setpoints Values – Rated Dome Pressure

Setpoint Parameters	Current MNGP Flow-Instrument Pressure Drop (psid)	Calculated Flow Rate (% EPU Flow) at Rated Dome Pressure
Analytical Limit (AL)	165	[[
Allowable Value (AV)	151.95	
Nominal Trip Setpoint (NTSP)	143	]]

* Obtained by linear interpolation

XcelEnergy

Calculation Signature Sheet

Document Information	
NSPM Calculation (Doc) No: 95-075	Revision: 01
Title: Main Steam Line HIgh Flow Setpoint	
Facility: ☒ MT ☐ PI	Unit: ☒ 1 ☐ 2
Safety Class: ☒ SR ☐ Aug Q ☐ Non SR	
Special Codes: ☐ Safeguards ☐ Proprietary	
Type: **Calc** Sub-Type:	

NOTE:	Print **and** sign name in signature blocks, as required.

Major Revisions		☐ N/A
EC Number: 13638	☐ Vendor Calc	
Vendor Name or Code:	Vendor Doc No:	
Description of Revision: See Purpose section of calculation		
The following calculation and attachments have been reviewed and deemed acceptable as a legible QA record		☐
Prepared by: (sign) [signature] / (print) Rhon Sanderson	Date: 02-01-13	
Reviewed by: (sign) Michael Q Cray / (print) Mike Cray	Date: 2/1/2013	
Type of Review: ☒ Design Verification ☐ Tech Review ☐ Suitability Review		
Method Used (For DV Only): ☒ Review ☐ Alternate Calc ☐ Test		
Approved by: (sign) J. N. Gausman / (print) JIM GAUSMAN	Date: 2/13/13	

Minor Revisions		☐ N/A
EC No:	☐ Vendor Calc:	
Minor Rev. No:		
Description of Change:		
Pages Affected:		
The following calculation and attachments have been reviewed and deemed acceptable as a legible QA record		☐
Prepared by: (sign) / (print)	Date:	
Reviewed by: (sign) / (print)	Date:	
Type of Review: ☐ Design Verification ☐ Tech Review ☐ Suitability Review		
Method Used (For DV Only): ☐ Review ☐ Alternate Calc ☐ Test		
Approved by: (sign) / (print)	Date:	

Record Retention: Retain this form with the associated calculation for the life of the plant.

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Calculation Signature Sheet

NOTE:	This reference table is used for data entry into the PassPort Controlled Documents Module reference tables (C012 Panel). It may also be used as the reference section of the calculation. The input documents, output documents and other references should all be listed here. Add additional lines as needed by using the "TAB" key and filling in the appropriate information in each column.

Reference Documents (PassPort C012 Panel from C020)

#	Controlled* Doc? +	Type	Document Name	Document Number	Doc Rev	Ref Type** INPUT	OUTPUT
1	x	CALC	MNGP EPU Task Report: Transient Analysis	TO900, EC 11250	0	X	
2			DIT: High Main Steam Flow Analytical Limit and Tech Spec Limit	EPU-0258, Att. 4		X	
3			DIT: High Main Steam Line High Flow Setpoint	EPU-0259, Att. 5		X	
4			MNGP EPU Task Report: Environmental Qualification	T1004, EC 11836	0	X	
5			Ashcroft Digital Test Gauge Operating Instructions			X	
6	X	VTM	Mansfield and Green Pneumatic Dead Weight Tester	NX-17448	0	X	
7	X	CALC	MNGP EPU Task Report: Moisture Carryover in MSL	T2005, EC 11256		X	
8			"General Electric Setpoint Methodology", September 1996	NEDC 31336P-A		X	
9			"Setpoint Calculation Guidelines for the Monticello Nuclear Generating Plant", DRF A-00-01932-1	GE-NE-901-021-0492		X	
10	X	PROC	Engineering Standards Manual ESM-03.02 "Design Requirements, Practices, & Topics (Instrumentation & Controls)"	ESM-03.02	12	X	
11			ANSI/ISA Standard ISA-S67.04 – Part I "Setpoints for Nuclear Safety-Related Instrumentation" 1994	ISA-S67.04			
12			ISA Recommended Practice RP67.04 – Part II "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation" 1994	RP67.04			
13			EPRI report TR-103335, "Guidelines for Instrument Calibration Extension / Reduction Programs" 3/94	TR-103335		X	
14			Monticello Plant Component Master List (CML) Database			X	X
15			Barton product bulletin 288A/289A-7, "Differential Pressure Indicating Switches (Attachment 6 of this calculation)			X	
16	X	PROC	ESM-03.02-APP-I, GE Methodology Instrumentation and	ESM-03.02-APP-I	4	X	

Record Retention: Retain this form with the associated calculation for the life of the plant.

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Calculation Signature Sheet

			Controls				
17	X	DRAW	NX-7829-67-1, Rack (25-26) C-126, Rev. B	NX-7829-67-1	76	X	
18	X	SPEC	Purchase Spec 21A1058, Controlled Specification Data Sheet Steam Flow Restrictor	MPS-0165	4	X	
19	X	CALC	"Calculation to Determine Discharge Coefficient Changes for the Main Steam Line Flow Restrictors"	97-216	0	X	
20	X	CALC	Determine Instrument Service Conditions for Input into Setpoint Calculations	95-027	1	X	
21	X	PROC	"GE Methodology Instrumentation and Controls"	ESM-03.02-APP-III	5	X	
22			MEDO-10544, April 1972, "Modified Steam Line Flow Limiting Venturi Test Results" (Attachment 7 of this calculation)			X	
23			Telephone conversation record from Bechtel Power Setpoint Group to ITT Barton (Attachment 8 of this calculation)			X	
24	X	CALC	"Environmental Qualification of Barton Pressure Switches Models 278, 288, 288A and 289A	98-011	0	X	
25			Generic Letter 91-04, Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle	91-04		X	
26	X	PROC	Operations Daily Log – Part J OutPlant		107		X
27	X	PROC	Maint Steam Line High Flow Group I Instrument Test	0051	31		X
28			GE Hitachi DRF Section 0000-0156-8601, dated January 17, 2013. (Attachment 10 of this calculation)			X	
29			GEH 10 CFR Part 21 Communication, "Error in Main Steam Line High Flow Calculational Methodology," SC 12-189, R1, issued December 12, 2012.				

* Controlled Doc marked with an "X" means the reference can be entered on the C012 panel in black. Unmarked lines will be yellow. If marked with an "X", also list the Doc Type, e.g., CALC, DRAW, VTM, PROC, etc.

** Mark with an "X" if the calculation provides inputs and/or outputs or both. If not, leave blank. (Corresponds to PassPort "Ref Type" codes: **Inputs / Both** = "ICALC", **Outputs** = "OCALC", **Other / Unknown** = blank)

Other PassPort Data

Record Retention: Retain this form with the associated calculation for the life of the plant.

Xcel Energy

Calculation Signature Sheet

Associated System (PassPort C011, first three columns) **OR** **Equipment References** (PassPort C025, all five columns):

Facility	Unit	System	Equipment Type	Equipment Number
MT	1	MST	INDREC	DPIS-2-116 A, B, C, D
MT	1	MST	INDREC	DPIS-2-117 A, B, C, D
MT	1	MST	INDREC	DPIS-2-118 A, B, C, D
MT	1	MST	INDREC	DPIS-2-119 A, B, C, D

Superseded Calculations (PassPort C019):

Facility	Calc Document Number	Title
MT	CA-95-075 Rev. 0	Maint Steam Line High Flow Setpoint Drift Analysis

Description Codes - Optional (PassPort C018):

Code	Description (optional)	Code	Description (optional)

Notes (Nts) - Optional (PassPort X293 from C020):

Topic Notes	Text
☐ Calc Introduction	☐ Copy directly from the calculation Intro Paragraph **or** ☐ See write-up below
☐ (Specify)	

Record Retention: Retain this form with the associated calculation for the life of the plant.

Xcel Energy

Calculation Signature Sheet

Monticello Specific Information

☒ YES ☐ N/A Topic Code(s) (See MT Form 3805): RATE
☐ YES ☐ N/A Structural Code(s) (See MT Form 3805):______

Does the Calculation:

☐ YES ☒ No Require Fire Protection Review? (Using MT Form 3765, "Fire Protection Program Checklist", determine if a Fire Protection Review is required.) If YES, document the engineering review in the EC. If NO, then attach completed MT Form 3765 to the associated EC.

☐ YES ☒ No Affect piping or supports? (If Yes, Attach MT Form 3544.)

☐ YES ☒ No Affect IST Program Valve or Pump Reference Values, and/or Acceptance Criteria? (If Yes, inform IST Coordinator and provide copy of calculation.)

Record Retention: Retain this form with the associated calculation for the life of the plant.

Xcel Energy	**Design Review Checklist**

EC Number or Document Number / Title / Revision Number: CA-95-075, Main Steam Line High Flow Setpoint, Rev. 1

Verifier's Name: Mike Cray

Discipline: Design Engineer, Electrical

DESIGN REVIEW CONSIDERATIONS:		Yes	No	N/A
1.	Were the inputs correctly selected and incorporated into design?	☒	☐	☐
2.	Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent re-verifications when the detailed design activities are completed?	☒	☐	☐
3.	Are the appropriate quality and quality assurance requirements specified?	☒	☐	☐
4.	Are the applicable codes, standards, and regulatory requirements including issue and addends properly identified and are their requirements for design met?	☒	☐	☐
5.	Have applicable construction and operating experience been considered?	☒	☐	☐
6.	Have the design interface requirements been satisfied?	☒	☐	☐
7.	Was an appropriate design method used?	☒	☐	☐
8.	Is the output reasonable compared to inputs?	☒	☐	☐
9.	Are the specified parts, equipment and processes suitable for the required application?	☒	☐	☐
10.	Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?	☐	☐	☒
11.	Have adequate maintenance features and requirements been specified?	☒	☐	☐
12.	Are accessibility and other design provisions adequate for performance of needed maintenance and repair?	☒	☐	☐
13.	Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?	☒	☐	☐
14.	Has the design properly considered radiation exposure to the public and plant personnel?	☒	☐	☐
15.	Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?	☒	☐	☐
16.	Have adequate pre-operational, subsequent periodic test and inspection requirements been appropriately specified, including acceptance criteria?	☒	☐	☐
17.	Are adequate handling, storage, cleaning, and shipping requirements specified?	☒	☐	☐
18.	Are adequate identification requirements specified?	☒	☐	☐
19.	Are requirements for record preparation, review, approval, and retention adequately specified?	☒	☐	☐
20.	Have Design and Operational Margins been considered and documented?	☒	☐	☐

COMMENTS: ☒ None (mc) ☒ Attached (Use Form QF-0528) ☐ In EC Topic Notes

QF-0528 (FP-E-MOD-07) Rev. 1

Xcel Energy	**Design Review Comment Form**

Sheet 1 of ___

DOCUMENT NUMBER/ TITLE: CA-95-075, Main Steam Line High Flow Setpoint

REVISION: 1 DATE: ________

ITEM #	REVIEWER'S COMMENTS	PREPARER'S RESOLUTION	REVIEWER'S DISPOSITION
1	Section 6.2.1.4 Analyzed Device Drift (AD) is based on data up through 2008. This value should be periodically validated.	A review of data in the CMH database for instrument calibrations since 2008 shows that the Main Steam Line Instruments continue to perform in accordance with the analyzed drift value applied in this calculation. In addition, margin exists in the calc such that the exact analyzed drift value is not critical toward determination of acceptability. No update to formal drift analysis is necessary.	accepted

Reviewer: Mike Cray Date: 2/1/2013 Preparer: Rhon Sanderson Date: ________

Michael Cray

TABLE OF CONTENTS

1. PURPOSE

The Main Steam Line high flow trip portion of the reactor isolation system detects and isolates breaks in the large steam lines outside the reactor containment. The Main Steam Line Differential Pressure Switches provide the high steam flow MSIV signal.

The purpose of this calculation is to determine acceptable instrument settings for the main steam lines high flow instruments DPIS-2-116 to DPIS-2-119 A, B, C, & D. Instrument settings include the Nominal Trip Setpoint, the Allowable Value and ALT /AFT values. Calculation outputs will be used to verify the adequacy of current setpoints. Revision 1 of this calculation takes into consideration the effects of extended power uprate (EPU) and the new Analytical Limit. This calculation was performed with a goal of retaining the current setpoint value of 143 psid (Reference 10.7). This is considered acceptable because the current setpoint remains conservative under EPU conditions.

Revision 1 of this calculation also incorporates new main steam line flow element choked flow and differential pressure information provided in General Electric DRF 0156-8601 (Input 4.9). This DRF is a Monticello plant-specific follow up to a GE Part 21 communication (Reference 10.19). An improved modelling methodology was used by GE to revise the previously assumed values for choked flow and the relationship between break flow and the corresponding flow element differential pressure.

Revision 1 of this calculation was originally prepared and reviewed by Sargent & Lundy (S&L vendor document no. 11972-049). The original QF-0549 calculation signature sheet for the S&L prepared and Monticello site reviewed and approved revision 1 of this calculation will be included as Attachment 09. As the original revision 1 was not issued, it will be further changed to reflect the GE information noted above but this new version will still be considered and ultimately issued as revision 1.

The changes per the GE DRF to this calculation do not result in a change to the previously submitted Analytical Limit, Allowable Value, or Nominal Setpoint, which were and are all defined as a differential pressure across the flow element(s). The As-Left and As-Found tolerances are being increased slightly to bring them in line with practical I&C calibration capabilities. These increased setting tolerance values leave considerable margin with respect to protection of the defined Analytical Limit and Allowable Value differential pressures. The licensing (Tech Specs) Allowable Value will be re-calculated as this value was expressed as a percent of rated (100% EPU power) steam flow. Per GE the retention of the previously evaluated Analytical Limit and Allowable Value expressed as a differential pressure (in units of psid) ensures conservative margin for operation of the main steam line high flow trip instruments vs. the differential pressure modelled for break (choked) flow.

Changes to this calculation body subsequent to the 2009 approval are identified by italic, underlined text.

2. METHODOLOGY

This calculation is performed using the GE Setpoint Methodology as a guide as described in Appendix I to Engineering Standards Manual Section ESM-03.02, Revision 4, Design Requirements, Practices, & Topics (Instrumentation and Controls) (Reference 10.9). This methodology utilizes statistical estimates of the various instrument errors to achieve conservative, but reasonable, predictions of instrument channel uncertainties. The objective of the statistical approach to setpoint calculations is to achieve a workable compromise between the need to ensure instrument trips when appropriate, and the need to avoid spurious trips that may unnecessarily challenge safety systems or disrupt plant operation.

The determination of the differential pressure switch drift value used in this calculation is performed in accordance with ESM-03.02-APP-III (Reference 10.14).

3. ACCEPTANCE CRITERIA

The setpoint and instrument settings should be such that the Analytical Limit will not be exceeded when all applicable instrumentation uncertainties are considered. The existing setpoints and As-found/As-left ranges will be verified to provide sufficient margin using the GE methodology as a guide. A setpoint value will be established with a 95%/95% tolerance interval as a criteria of uncertainties (Reference 10.9). That is, there is a 95% probability that the constructed limits contain 95% of the population of interest for an 18-month +25% calibration interval (Reference 10.18) for the pressure switches (although these devices are calibrated every 3 months). If the existing setpoint and ranges do not provide sufficient margin, new setpoints or ranges will be specified by this calculation.

4. INPUTS

4.1 MNGP EPU Task Report T0900: Transient Analysis EC11830. GE-NE-0000-0062-2932 OPL-3, Transient Protection Parameters Verification for Reload Licensing Analysis.

	Cycle 24 Value	EPU Value
Rated Flow	7.259 10^6 lb/hr	8.335 10^6 lb/hr

4.2 DIT EPU-0258

	EPU Value	% EPU flow
Proposed Tech Spec Limit (AV)	151.95 psid	123.64%

4.3 DIT EPU-0259

140% existing flow	147.7 psid

4.4 MNGP EPU Task Report T1004: Environmental Qualification EC11836, Rev. 1. March 2008. This Input demonstrates environmental conditions used in the evaluation of Reference 10.13 will not change due to EPU. This reference provides the environmental conditions for the instruments in this calculation.

4.5 Monticello Component Master List (CML). The CML contains information regarding the pressure switches and calibration tools listed in this calculation.

Calibration Device	Description
XPI-9021	Ashcroft 2089
XPS-95171	Mansfield and Green TQ-50

4.6 NX-63626, Ashcroft Digital Test Gauge Operating Instructions

Calibration Device	Range	Accuracy
XPI-9021 (Ashcroft 2089)	0-500 psig	0.05% Full Scale

4.7 NX-17448, Mansfield and Green Pneumatic Dead Weight Tester.

Calibration Device	Range	Accuracy
XPS-95171 (Mansfield and Green TQ-50)	100-5000 psig	0.025% Reading

4.8 MNGP EPU Task Report T2005, Moisture Carryover in MSL (EC11845). This Input evaluates the effect of increased moisture carryover on the main steam flow instrumentation.

4.9 *GE Hitachi DRF Section 0000-0156-8601, dated January 17, 2013. This document is included as Attachment 10.*

5. ASSUMPTIONS

Validated Assumptions

5.1 M&TE reference accuracy were assumed to be 3 sigma values unless otherwise noted.

5.2 No seismic data is available for the Barton switches. Per Section 6.2.1.2, the ZPA of the C-126 the rack is 0.41g. Normal vibration effects are considered as part of the analyzed drift. Per Section 6.1.1, seismic events are not considered as a service condition for the DPIS devices.

6. ANALYSIS

6.1 Instrument Channel Arrangement

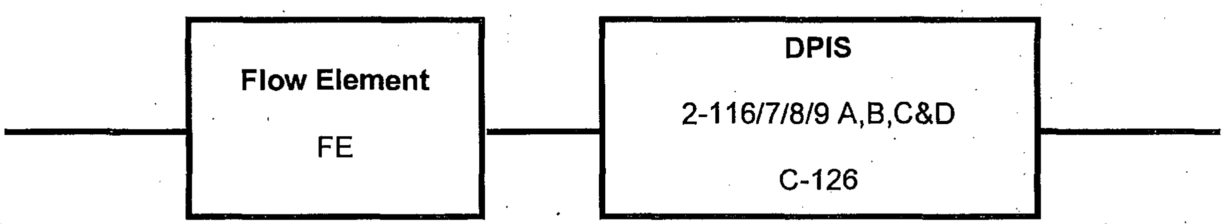
6.1.1 Loop Information:

DPIS-2-116 to DPIS-2-119 A, B, C & D are used during a Main Steam Line Break to close the MSIVs due to high steam flow. The flow in each of four steam lines is monitored by 4 DPIS switches across each of the flow elements. In the event of a Main Steam Line Break, the element restricts the flow to 200% of the original rated mass flow or less. This rate is the design safety limit. A one out of two twice high flow signal in any one steam line will result in isolating all four Main Steam Lines.

These instruments are required to function immediately upon a Main Steam Line Break and are not required to maintain setpoint accuracy during long term post accident conditions. As such, long term harsh environment effects are not applicable in this calculation.

The Barton Model 278 DPIS devices are Mercury type switches. As such, seismic events have a significant impact on the performance of the devices. Per Reference 10.13, seismic events are not considered as a service condition for the DPIS devices. As such, seismic events are not applicable in this calculation.

6.1.2 Loop Diagram:



6.2 Instrument Definition and Determination of Device Error Terms

6.2.1 Device 1:

6.2.1.1 Instrument Definition:

Component ID:	DPIS-2-116 to 119 A, B, C, D	Reference / Input
Location	Reactor Building 935' East C-126	10.7
Manufacturer:	Barton	10.7
Model Number:	278	10.7
Range:	200 psid	10.7
Input Signal:	Main Steam Line Process Differential Pressure	10.7
Current Setpoint:	143 psid (increasing)	10.7
Output Range:	N/A (i.e. contact opens/closes)	

6.2.1.2 Environmental Process and Physical Interfaces:

Calibration Conditions (Environmental):		Reference / Input
Temperature:	65 to 90°F	10.13, 4.4
Radiation:	Negligible	10.13, 4.4
Pressure:	Normal atmospheric	10.13, 4.4
Humidity:	20 to 90%	10.13, 4.4

Calibration Surveillance Interval: 3 mos ± 25%

Normal Plant Conditions (Environmental):		Reference / Input
Temperature:	60 to 104°F	10.13, 4.4
Radiation:	Negligible	10.13, 4.4
Pressure:	Normal atmospheric	10.13, 4.4
Humidity:	20 to 100%	10.13, 4.4

Trip Conditions (Environmental):		Reference / Input
Temperature:	104 to 173°F	10.13, 4.4
Radiation:	Negligible	10.13, 4.4
Pressure:	15.3 psia	10.13, 4.4
Humidity:	100 %	10.13, 4.4

Seismic Conditions:		Reference
OBE: (Instrument Rack C-126)	0.41g	5.2, 10.13

Main Steam Line Process Conditions:		Reference
Test Pressure	1200 psi	10.10

6.2.1.3 Device Accuracy (A_{iN}, A_{iT} & A_{iP}):

Term	Value		Sigma	Reference
VA:	± 0.4 psid	Note 1	2	10.8
ATE:	0	Note 2	N/A	10.8
OPE:	0	Note 3	N/A	Section 6.2.1.2, 10.8
SPE:	± 0.6 psid (bias)	Note 4	2	10.16
SE:	0		N/A	Section 6.1.1
RE:	0		N/A	Section 6.2.1.2
HE:	0	Note 5	N/A	10.8
PSE:	N/A	Note 6	N/A	N/A
REE:	N/A	Note 6	N/A	N/A

Note 1: Vendor Accuracy (VA) is based on switch repeatability error equal to ± 0.2% of Full Scale.

(± 0.002) * (200 psid) = ± 0.4 psid

Note 2: The maximum operating temperature of the switch is 200 °F. Vendor does not provide temperature effect values. Per Section 6.2.1.2, the maximum environmental temperature of 173 °F is bounded by the operating range of the device. Additionally, the vendor states that the devices contain a temperature compensator, which automatically protect the unit from zero and calibration drift when the instrument is subjected to a change in ambient temperature. Therefore, temperature effects are considered to be included in the vendor accuracy term.

Note 3: The switch has been selected to operate within the Main Steam Line maximum pressure of 1200 psi as specified per Section 6.2.1.2. Therefore, Overpressure Effects are not applicable.

Note 4: Per Reference 10.16, the SPE for a Barton Model 288A is 0.25 % FS per 1000 psi. Per Calculation CA-98-011 (Reference 10.17) the only significant difference between Model 278 and 288A is the use of a mercury switch vs. a snapping action switch. As such, the static pressure effect for a Barton Model 288A is applicable to the MSL High Flow DPIS devices as well. Per Section 6.2.1.2, the maximum line pressure is 1200 psi.

Effects of static pressure, not accounted for during calibration, are considered bias values. It is not known whether effects of static pressure will impact the DPIS devices in the positive or the negative direction. As such, SPE is considered a (+/-) bias value and will be applied to both sides of the process outside of the SRSS.

[(± 0.0025) * (1200 psi / 1000 psid)] = ± 0.3 % FS
± 0.3 % FS * 200 psid = ± 0.6 psid (bias)

Note 5: Per Section 6.2.1.2, the maximum environmental humidity is 100%. Per Reference 10.8, switch model 278 is housed inside of a Weather-Proof casing. Environmental humidity has no effect on the devices.

Note 6: The switches are mechanical devices and therefore power supply and EMI /RFI effects are not applicable in this calculation.

Based on environmental conditions (Section 6.2.1.3 Note 2), the accuracy under Normal Conditions (A_{iN}) is the same as Accuracy Under Trip Conditions (A_{iT}). Accuracy under Long Term Post Accident Conditions (A_{iP}) is not required.

A_i = SRSS of random terms + bias terms

This loop consists of one device, therefore:

$A_L = A_{iN} = A_{iT} = \pm 0.4 \pm 0.6$ bias (2 sigma)

6.2.1.4 Analyzed Device Drift (AD)

Per Attachments 2 and 3, the 3.75-month *(3 months + 25%)* predicted drift uncertainty for the Main Steam Line High Flow DPIS devices is 2.00 psid.

Term	Value	Sigma	Reference
AD	2.0 psid	2	Attachments 2 and 3

This loop consists of one device, therefore:

D_L = AD = ± 2.0 psid

Note that the drift data used covers a period up through year 2008. This calculation rev. 1 was approved for issue in early 2009. The additional changes made (see Purpose section) do not require an updated drift analysis to justify. No changes are made to the Analytical Limit or Allowable Value (expressed as differential pressures) vs. the document approved in 2009. Setting tolerances are increased slightly but will remain conservative with respect to the Analytical Limit and Allowable Value with margin.

6.2.1.5 As Left Tolerances (ALT)

The suggested limit on the magnitude of the ALT calculated per Section 5.2.5 of Reference 10.9 is given as:

$$ALT = \frac{2}{3}\sqrt{(VA)^2 + (C)^2 + (C_{STD})^2}$$

$$ALT = 2\sqrt{(0.4/2)^2 + (0.25/3)^2 + (0.125/3)^2} = 0.44\,psid$$

(Calibration error terms are calculated in Section 6.2.1.6)

The existing As-Left Tolerance specified on the calibration worksheet is ± 4.5 psid. This tolerance value is unacceptable because it is considered excessive and will *force selection of As-Found tolerances that could* "mask" instrument performance degradation. The calculated ALT value of ± 0.44 psid is also considered

unacceptable because previous instrument performance suggests that this value is not routinely achievable and therefore impractical.

Therefore, it is suggested that the ALT be revised to ± 1.5 psig. This value will prevent "masking" instrument performance degradation and is routinely achievable per Attachment 2.

6.2.1.6 Device Calibration Error (C)

		Value	Sigma	Reference
Calibration Tool Error	C_i:	0.25 psi	3	4.6, Note 1
Tool Calibration Error	C_{iSTD}:	0.125 psi	3	4.7, Note 2
As Left Tolerance	ALT:	1.5 psi	2	6.2.1.5

Note 1: Per Input 4.5, the differential pressure switches are calibrated with XPI-9021 (Ashcroft 2089). From Input 4.6, the vendor accuracy of the Ashcroft 2089 is 0.05% of full scale. Therefore, the XPI-9021 has an accuracy of 0.25 psi at 500 psi.

Calibration Device	Range	Accuracy	Reference
XPI-9021 (Ashcroft 2089)	0-500 psig	0.05% Full Scale	4.6

Note 2: Per Input 4.5, the Ashcroft 2089 is calibrated using the XPS-95171 dead weight tester. From Input 4.7, the vendor accuracy of the Mansfield and Green dead weight tester is 0.025% of output pressure. Therefore, the XPS-95171 has an accuracy of 0.125 psi at 500 psi.

Calibration Device	Range	Accuracy	Reference
XPS-95171 (Mansfield and Green Deadweight tester)	100-5000 psig	0.025% Reading	4.7

Since calibration term values are controlled by 100% testing they are assumed to represent 3 sigma values. Individual calibration error terms are combined using the SRSS method and normalized to a 2 sigma confidence level:

$$C_L = \text{Device 1 Calibration Error}$$

$$C_L = \frac{2}{3}\sqrt{C^2 + C_{STD}{}^2 + ALT^2}$$

$$C_L = 2\sqrt{(0.25/3)^2 + (0.125/3)^2 + (1.5/2)^2}$$

$$C_L = 1.52\,\text{psid}$$

CL = 1.52 psid

6.3 Determination of Primary Element Accuracy (PEA) and Process Measurement Accuracy (PMA)

PEA: There is a Primary Element Accuracy value associated with the steam flow restrictor (flow element). Per the purchase specification, Reference 10.11, the accuracy of the steam flow restrictors is to be within ± 2% of original rated flow. Per Reference 10.1, the 2% error is valid at 140% of original rated flow. The existing setpoint of 143 psid is within this flow rate. Therefore, the 2% error is taken as the PEA value for this calculation. Per Reference 10.5, since the effect of the PEA value cannot be predicted at a particular future instant, it is considered a random value; and is thus eligible for SRSS combination. Therefore:

PEA = ± 2% of flow (random term).

PMA: Per Reference 10.1, Section 3.13.5, the actual differential pressure signal from the flow element is proportional to the specific volume of the steam. At pressures higher than the design pressure, process measurement accuracy (PMA) error exists. Per Reference 10.1, Section 3.13.5, a PMA allowance of 2% rated flow is utilized for determining the Main Steam Line High Flow Setpoint. Although Reference 10.1 does not specify whether or not this effect should be applied as a random or bias value, the PMA causes a known effect on the instrument loop and should be applied as a bias term. For simplicity purposes, the PMA value is considered a (+/-) bias value and will be applied to both sides of the process outside of the SRSS. Errors due to pressures lower than the design pressure will create an early (conservative) trip and are not evaluated in this calculation. Therefore:

PMA = ± 2% of flow (bias term).

The values of PEA and PMA specified above are given in units of flow. In order to combine these effects with other loop uncertainty values, PEA and PMA must be converted to units of differential pressure at the flow rate of interest. This calculation uses the existing trip setpoint flow rate as the flow rate of interest. Converting from DP to Flow is done using the general Flow / DP relationship:

$\text{Flow} = K * (DP)^{1/2}$ or $DP = (\text{Flow} / K)^2$

Per Input 4.3:
140% of existing flow = 147.7 psid

Per Input 4.1:
Rated flow $7.259 * 10^6$ lb/hr existing
Rated flow $8.335 * 10^6$ lb/hr after EPU

Solving for K using the existing flow rate of $7.259*10^6$ lb/hr:
$(1.40)*7.259*10^6 = K * (147.7)^{1/2}$
$K = ((1.40)*7.259*10^6) / ((147.7)^{1/2}) = 836208$

This is the collective K value for all four steam lines. To get the K value for an individual steam venturi, the value is divided by four.

Individual K value = 836208 / 4 = 209052

Using the above equation to determine the flow rate at 143 psid (existing setpoint):
$Flow_{143\ psid} = 209052 * (143)^{1/2}$
$Flow_{@143\ psid} = 2.4999 * 10^6$ lb/hr.

Therefore, a 2% flow error (PEA and PMA) is calculated as follows:

$Flow_{@2\%\ error} = 1.02 * (2.4999 * 10^6$ lb/hr.)
$Flow_{@2\%\ error} = 2.5499 * 10^6$ lb/hr.

Converting to differential pressure:
$DP_{@2\%\ error} = (2.5499 * 10^6 \text{ lb/hr.} / 209052)^2$
$DP_{@2\%\ error} = 148.78$ psid

2% Error = (DP at 2% error – DP at setpoint)
2% Error = 148.78 - 143
2% Error = 5.78 psid

The improved GE modelling methodology for 2-phase break flow through the flow elements shows a different relationship between flow element differential pressure and mass flow than assumed in defining the PMA error. Reviewing Table 1 of Input 4.9 shows that with respect to protection of the true analytical limit being protected, i.e. the calculated dp at choke flow conditions less recommended margin, an additional margin of 139 psid exists. In other words, the Analytical Limit of 165 psid (Section 6.5.1) chosen to be the limiting value for calculating instrument settings in this document is conservative by a margin of 139 psid. Due to this large margin, instrument errors that impact evaluation of spurious trip avoidance and LER avoidance will continue to be determined based on theoretical flow element performance assuming dry steam.

6.4 Determination of Other Error Terms

Term	Value
Operator Reading Error (ORE)	N/A
Insulation Resistance (IRE)	N/A
Other	± 2.5 psid (random term)

The conversion from DP to steam flow has been derived using test data from NEDO - 10544 (Reference 10.15). Per Reference 10.15, the flow limiters have an effective discharge coefficient of 0.97 compared to a predicted value of 1.0. This is equivalent to an error in differential pressure of 2.5 psid. This unpredicted variance of - 0.03 has an additional effect on the accuracy of the flow element (PEA) determined in Section 6.3. Per Reference 10.12, the change is flow coefficient for EPU conditions is negligible.

Since the Coefficient of Discharge is directly related to the accuracy of the flow element, this effect is considered a component of PEA and thus a random value; eligible for SRSS combination.

6.5 Calculation of Allowable Value and Operating Setpoint

6.5.1 Allowable Value (AV):

Per Reference 10.2, the *original* Analytical Limit (AL) is 140% of original rated flow, which was considered to correspond to 160.63 psid across the flow elements. *This value was chosen by GE to provide a margin above the original operational limit. GE DRF 0156-8601 (Input 4.9) documents the results of improved modelling of the actual flow element differential pressure vs. flow considering wet steam conditions. Per Table 2 of this DRF, an Analytical Limit of 160.63 psid would correspond to a lessor flow value, roughly 120 %. As the GE DRF guidance justifies the conservatism of the existing differential pressure instrument settings, the Analytical Limit differential pressure will be selected at 165 psid. Table 1 of the DRF demonstrates that an Analytical Limit of 165 psid has more than the recommended margin to the differential pressure corresponding to choked flow under break conditions.*

An Analytical Limit of 165 psid is an acceptable value as it is low enough to trip during a break of any main steam line. The AL is well below the Design Safety Limit of 200% of original rated flow and the choke flow of the venturis. It is also high enough above the operational limit to avoid spurious trips due to transients and valve testing. *Per Table 1 of input 4.9, an additional 139 psid of margin exists above the chosen Analytical Limit of 165 psid with respect to ensuring an instrument trip at choked flow conditions.*

This value is used along with the following terms to calculate the Allowable Value.

Term	Value	Sigma	Reference
A_{iT}	± 0.4 (random)	2	Section 6.2.1.3
A_{iT}	± 0.6 (bias)	N/A	Section 6.2.1.3
C_L	± *1.52*	2	Section 6.2.1.6
PEA	± 5.78 (random)	2	Section 6.3
PMA	± 5.78 (bias)	N/A	Section 6.3
Other	± 2.5 (random)	2	Section 6.4

$$AV \le AL - \left(\frac{1.645}{2}\right)\sqrt{\left(A_{iT}^2 + C_L^2 + PEA^2 + OTHER\ RANDOM\right)} + \text{bias terms}$$

$$AV \le 165 - \left(\frac{1.645}{2}\right)\left(\sqrt{0.4^2 + 1.52^2 + 5.78^2 + 2.5^2}\right) - 5.78 - 0.6$$

$$AV \le 165 - 5.34 - 5.78 - 0.6$$

$$AV \le 153.28$$

The proposed Tech Spec Limit of 151.95 is conservative and will be used as the Allowable Value. This results in an extra margin of *1.33 psid* to be included in the determination of $NTSP_1$.

Therefore,

AV = 151.95 psid
Per Table 2 of Input 4.9, the corresponding value of flow would be interpolated as 116.9% EPU flow

6.5.2 Nominal Trip Setpoint (NTSP):

Per Reference 10.5 and 10.9, for processes approaching a setpoint from a single side of interest, a reduction factor of (1.645 /2) may be applied for random terms.

$$NTSP_1 = AL - \left(\frac{1.645}{2}\right)\sqrt{A_{iT}^2 + C_L^2 + D_L^2 + PEA^2 + OTHER^2} + \text{bias terms} + \text{margin}$$

$$NTSP_1 = 165 - \left(\frac{1.645}{2}\right)\sqrt{0.4^2 + 1.52^2 + 2.0^2 + 5.78^2 + 2.5^2} - 5.78 - 0.6 - 1.33$$

$$NTSP_1 = 151.7$$

6.5.3 Licensee Event Report (LER) Avoidance Evaluation:

The purpose of the LER Avoidance Evaluation is to ensure that there is sufficient margin provided between the AV and the NTSP to reasonably avoid violation of the AV. For a single instrument channel a Z value of greater than 1.29 provides sufficient margin between the NTSP and the AV. Although this is a multi channel loop, a Z of 1.29 will be used for conservatism. Therefore, $NTSP_2$ is calculated to provide a lower bound for the NTSP based on LER avoidance criteria.

$$\text{Sigma(LER)} = \frac{1}{2}\left(\sqrt{A_{iN}^2 + C_L^2 + D_L^2}\right) + \text{bias}$$

$$Sigma(LER) = \frac{1}{2}\left(\sqrt{0.4^2 + 1.52^2 + 2.0^2}\right) + 0.6$$

$$Sigma(LER) = 1.87$$

$$NTSP_2 = AV - Z \times Sigma(LER)$$
$$NTSP_2 = 151.95 - (1.29 \times 1.87)$$
$$NTSP_2 = 149.5$$

Therefore, an NTSP ≤ _149.5_ psid will result in a Z greater than 1.29 and provide sufficient margin between the NTSP and the AV.

6.5.4 Selection of Operating Setpoint:

$$NTSP \leq \text{Controlling NTSP - ALT}$$
$$NTSP \leq NTSP_1 - ALT$$
$$NTSP \leq 149.5 - 1.5$$
$$NTSP \leq 148.0$$

The current setpoint of 143 psid (Reference 10.7) is conservative and is considered acceptable.

6.5.5 Leave Alone Zone:

Leave Alone Zones/Tolerances are not used at the MNGP per Reference 10.9.

6.5.6 Establishing As-Found Tolerance (AFT):

An As-Found Tolerance is calculated to provide suggested limits for use during the surveillance testing:

$$AFT = \sqrt{ALT^2 + AD^2}$$
$$AFT = \sqrt{1.5^2 + 2.0^2}$$
$$AFT = 2.5$$

In order to better bound expected instrument performance as indicated by the data in Attachment 3, the calculated As-Found tolerance will be increased by 0.5 psid, to 3.0 psid. This value remains tight enough to serve as a flag for degrading instrument performance (excessive drift).
AFT = ± _3.0_ psid

6.5.7 Required Limits Evaluation:

The purpose of a Required Limits Evaluation is to ensure that the combination of errors present during calibration of each device in the channel is accounted for while allowing for the possibility that the devices may both be recalibrated. Since this loop contains only one device, an evaluation is not required.

6.5.8 Spurious Trip Avoidance Evaluation:

The STA is evaluated against the edge of the As-Left Tolerance band for conservatism. Refer to Reference 10.1 for more detail. Per Section 6.5.4, the operating setpoint is 143 psid. Per Section 6.2.1.5, the ALT is ~~1.0~~ 1.5 psid. Therefore,

(NTSP – ALT) = 143 psid – *1.5* psid
(NTSP – ALT) = *141.5* psid

$$Sigma(STA) = \left(\frac{1}{2}\right)\left(\sqrt{A_{iN}^{2} + C_{L}^{2} + D_{L}^{2} + PEA^{2} + OTHERRANDOM^{2}}\right) + bias$$

$$Sigma(STA) = \left(\frac{1}{2}\right)\left(\sqrt{0.4^{2} + 1.52^{2} + 2.00^{2} + 5.78^{2} + 2.5^{2}}\right) + 5.78 + 0.6$$

$$Sigma(STA) = 9.78$$

Per Section 3.13.3 of Reference 10.1, the existing operational limit is considered to be 127 % rated flow based on operating experience. The same operational limit will be used for EPU during Main Steam valve testing. The valve testing occurs at reduced power and therefore the existing operational limit of 121.54 psig is acceptable.

$$Z_{STA} = \frac{|Adjusted\ NTSP - Operational\ Limit|}{Sigma(STA)}$$

$$Z_{STA} = \frac{|141.5 - 121.54|}{9.78}$$

$$Z_{STA} = 2.0$$

Therefore, the adjusted NTSP of *141.5* results in a Z_{STA} greater than 1.65 and provides assurance that no spurious trips will occur.

6.5.9 Elevation / Density Correction:

An elevation /line correction is not required for the DPIS switches. If a head pressure or process temperature does exist, a pressure or density change will be exerted on both sides of the switch equally and will have no noticeable effect on

differential pressure detected by the switch. As such, no significant error is introduced due to elevation or density changes.

Reference 10.15 indicates that there may be a zero offset possibly caused by a water leg between the steamline tap and the condensing chamber. This offset creates an indicated differential pressure larger than actual differential pressure. For increasing setpoints, this effect is conservative because it results in an early trip.

Task Report T2005 (Input 4.8) assessed the effect of increased moisture carryover on the main steam flow instrumentation at EPU conditions. The increase in measured pressure drop with moisture increase was found to have an insignificant influence on the main steam flow instrumentation.

6.6 Channel Error Calculation

Channel error calculation is not required to be determined. Instrument operation is required immediately upon main steam line break. Long term post accident evaluation is not needed.

7. CONCLUSIONS

The results of the calculations are as follows:

Term	Value (psid)
A_{IN}	± 0.4 (random) ± 0.6 (bias)
A_{IT}	± 0.4 (random) ± 0.6 (bias)
AD	± 2.0
C_L	± *1.52*
PEA	± 5.78
PMA	± 5.78
OTHER	± 2.5
ALT	± *1.5*
AL	165
AV	151.95
AFT	± *3.0*
NTSP	143

Based on these results, it is concluded that the Analytical Limit is not exceeded when all applicable uncertainties are considered.

8. FUTURE NEEDS

8.1 Plant procedure and CML changes will be implemented in accordance with the MNGP setpoint change process.

8.2 New Allowable Value expressed as a percent of rated flow derived per GE guidance must be submitted for license approval (see Attachment 11 for submittal recommendation).

9. ATTACHMENTS

1. Setpoint Relationships
2. Drift Analysis
3. Drift Analysis Spreadsheets
4. DIT EPU-0258
5. DIT EPU-0259
6. BARTON product bulletin 288A/289A-7, "Differential Pressure Indicating Switches (Reference 10.8).
7. NEDO-10544, April 1972, Modified Steam Line Flow Limiting Venturi Test Results (Reference 10.15).
8. Telephone conversation record between Bechtel Power Setpoint Group to ITT Barton (Reference 10.16).
9. *Signature sheet, Sargent & Lundy vendor doc. no. 11972-049*
10. *GE Hitachi DRF Section 0000-0156-8601, dated January 17, 2013. This document is included as Attachment 10*
11. *Summary of Change to Main Steam Line High Flow Allowable Value in accordance with GE Hitachi DRF Section 0000-0156-8601*

10. REFERENCES

10.1 NEDC 31336P-A, September 1996, "General Electric Setpoint Methodology".

10.2 GE-NE-901-021-0492 "Setpoint Calculation Guidelines for the Monticello Nuclear Generating Plant", DRF A00-01932-1.

10.3 Engineering Standards Manual ESM 03.02 "Design Requirements, Practices, & Topics (Instrumentation & Controls)" Rev. 9.

10.4 ANSI/ISA Standard ISA-S67.04 – Part I "Setpoints for Nuclear Safety-Related Instrumentation", dated September 1994.

10.5 ISA Recommended Practice RP67.04 – Part II "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation", dated 1994.

10.6 EPRI report TR-103335, "Guidelines for Instrument Calibration Extension/Reduction Programs", dtd 3/94.

10.7 Monticello Plant Component Master List (CML) Database.

10.8 BARTON product bulletin 288A/289A-7, "Differential Pressure Indicating Switches."

10.9 ESM-03.02-APP-I, GE Methodology Instrumentation and Controls.

10.10 NX-7829-67-1, Rack (25-26) C-126, Revision B.

10.11 Purchase specification 21A1058, Controlled Specification Data Sheet Steam Flow Restrictor.

10.12 CA-97-216, Revision 0, Calculation to Determine Discharge Coefficient Changes for the Main Steam Line Flow Restrictors.

10.13 CA-95-027, Revision 1, Determine of Instrument Service Conditions for Input into Setpoint Calculations.

10.14 ESM-03.02-APP-III, GE Methodology Instrumentation and Controls.

10.15 NEDO-10544, April 1972, Modified Steam Line Flow Limiting Venturi Test Results.

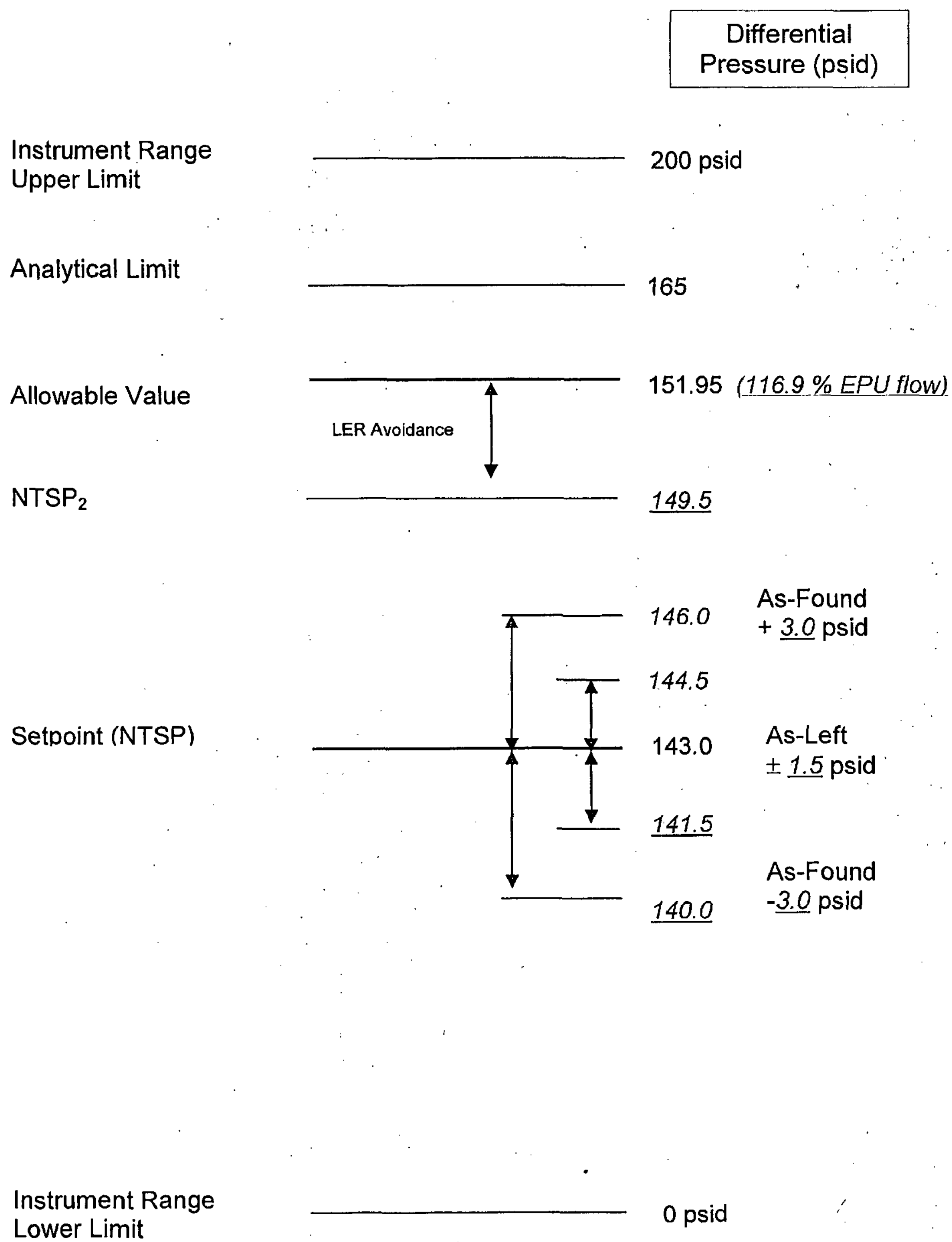
10.16 Telephone conversation record from Bechtel Power Setpoint Group to ITT Barton.

10.17 CA-98-011, Environmental Qualification of Barton Pressure Switches Models 278, 288, 288A and 289A.

10.18 Generic Letter 91-04, Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle.

10.19 *GEH 10 CFR Part 21 Communication, "Error in Main Steam Line High Flow Calculational Methodology," SC 12-189, R1, issued December 12, 2012.*

For Illustration Only Not to Scale



A1.1 Data Grouping

The following Barton model 278 differential pressure indicating switches are included in this analysis:

Equipment ID	Range	Setpoint (desired)
DPIS-2-116A	0 - 200 psid	143 psid
DPIS-2-116B	0 - 200 psid	143 psid
DPIS-2-116C	0 - 200 psid	143 psid
DPIS-2-116D	0 - 200 psid	143 psid
DPIS-2-117A	0 - 200 psid	143 psid
DPIS-2-117B	0 - 200 psid	143 psid
DPIS-2-117C	0 - 200 psid	143 psid
DPIS-2-117D	0 - 200 psid	143 psid
DPIS-2-118A	0 - 200 psid	143 psid
DPIS-2-118B	0 - 200 psid	143 psid
DPIS-2-118C	0 - 200 psid	143 psid
DPIS-2-118D	0 - 200 psid	143 psid
DPIS-2-119A	0 - 200 psid	143 psid
DPIS-2-119B	0 - 200 psid	143 psid
DPIS-2-119C	0 - 200 psid	143 psid
DPIS-2-119D	0 - 200 psid	143 psid

As shown in section 6.2.1.2, the devices are exposed to similar environmental conditions with the same calibration frequency. Therefore, the individual drift data for the devices can be grouped without further numerical testing, following the criteria set forth in step 5.4.8 of ESM-03.02-APP-III (Input 12).

A1.2 Populating the Spreadsheet

Calibration data for the switches included the date of calibration, as well as the As-Found and As-Left setpoint values. This data was input into a Microsoft Excel spreadsheet, and included in Attachment 2.

The calibration interval was determined by taking the difference between the current and previous calibration dates. Per step 5.3.9 of ESM-03.02-APP-III, the calibration interval was converted to months by dividing the number of days by 30.5 days per month.

The Drift value was calculated by taking the difference between the current calibration As-Found value and the previous calibration As-Left value.

None of the data points were removed from the final data set. Although the outlier test results showed several potential outliers, the points were kept in the analysis. Per the instructions of Attachment 1 from Input 12, there were no valid reasons for removing the outliers.

A1.3 Spreadsheet Performance of Basic Statistics

The following information was determined for each instrument individually:

The average or mean value ($\bar{x}$) of the drift data for each instrument was determined by using the "Average" function in Microsoft Excel. This function uses the following equation:

$$\bar{x} = \frac{\sum x_i}{n}$$

where $\bar{x}$ = average of data set
x_i = individual drift value
n = total number of values

The standard deviation of a data set returns the measure of how widely dispersed the values are in relation to the mean of the data. The standard deviation for each instrument was determined using the "STDEV" function. Microsoft Excel uses the following equation in the "STDEV" function:

$$s = \sqrt{\frac{n\sum x_i^2 - \left(\sum x_i\right)^2}{n(n-1)}}$$

where s = standard deviation of sample
x_i = individual drift value
n = total number of values

The variance (s^2) is another measure of data spread from the mean. The variance for each instrument was determined by using the "VAR" function in Microsoft Excel. The variance is calculated as follows:

$$s^2 = \frac{n\sum x_i^2 - \left(\sum x_i\right)^2}{n(n-1)}$$

where s^2 = variance of sample
x_i = individual drift value
n = total number of values

The largest positive drift value for each instrument was determined by using the "MAX" function.

The largest negative drift value for each instrument was determined by using the "MIN" function.

The number of data points (n) for each instrument was determined using the "COUNT" function.

The psid values for average, standard deviation, and largest positive and negative drift were converted to a percent of instrument span using the following formula:

$$\%\ \text{span} = \frac{\text{psid value}}{\text{psid span}} \times 100\%$$

A Drift Trend Plot was developed for each instrument by plotting the drift value versus calibration date. Bounds corresponding to ± 2s (2 standard deviations) are shown on the plot.

Page 49 of Attachment 2 presents the combined drift data statistics for the subject units. The combined statistics were determined using the preceding methods.

A1.4 Outlier Detection and Expulsion

Per step 5.5 of ESM-03.02-APP-III, the t-Test is used to detect the presence of outliers in the final data set. The t-Test requires the use of the following equation:

$$t = \frac{\left| x_i - \bar{x} \right|}{s}$$

where t = individual t-Test statistic
s = standard deviation of sample
x_i = individual drift value
$\bar{x}$ = individual drift value

The t-Test involves calculating the individual 't' statistic for each data point, and comparing them to a critical value. The critical value depends on the sample size, and is obtained from Table 9.2 of Input 12.

The t-Test is shown on pages 50 through 74 of Attachment 2. Based on a sample size of 1094, the critical value utilized in the t-Test is 4.0. Seven of the calculated individual t-Test statistics exceeded the critical value which, according to the t-Test, identifies them as outliers. However, based on the criteria of Attachment 1 to ESM-03.02-APP-III, none of the seven points were eliminated from the final data set.

A1.5 Normality Tests

Most statistical analyses make the assumption that the values in question are normally distributed. The criteria in Input 12 require that the data set be tested for normality. It is recommended that for samples of over 50 data points, the D' Test be utilized.

<u>D' (D-Prime) Test</u>
The D' Test calculates a test statistic value for the sample population and compares the calculated value to the values for the D' percentage points of the distribution, which are tabulated in Table 9.7 of ESM-03.02-APP-III. The D' Test is two-sided, which means that the two-sided percentage limits at the stated level of significance must bound the calculated D' value. For the given sample size, the calculated value of D' must lie with the two values provided in Table 9.7 in order to accept the hypothesis for normality.

To perform a D' Test, the drift value data set is sorted and numbered in ascending order from smallest to largest.

Calculate the S^2 value for the group:

$$S^2 = (n-1) \times s^2$$

where S^2 = sum of the squares about the mean
s^2 = unbiased estimate of the sample population variance
n = total number of data points

Calculate the linear combination (T) of the sample group:

$$t_i = \left(i - \frac{n+1}{2}\right) \times x_i$$

$$T = \sum t_i$$

where T = linear combination of the sample
t_i = individual component of T
i = number of sample point
n = total number of data points
x_i = individual sample data point

Calculate the D' value for the sample group. The following equation is used:

$$D' = \frac{T}{S}$$

Determine the critical D' values based on the sample size using Table 9.7 in Input 12. If the exact sample size is not listed in Table 9.7, interpolate the values to obtain an estimate of the critical D' values.

Refer to pages 75 through 98 of Attachment 2 to see the D' Test for the drift data. For a sample size of 1094, the critical D' values are 9833.6 and 9959.7. The calculated D' value was 9551.5. Based on this result, the assumption of normality is rejected.

<u>Coverage Analysis</u>
Since the assumption of normality was rejected by the D' Test, a coverage analysis was performed per section 4.7.5.E of ESM-03.02-APP-III. A coverage analysis is discussed for cases in which the hypothesis tests reject the assumption of normality, but the assumption of normality may still be a conservative representation of the data. The coverage analysis involves the use of a histogram of the data set, overlaid with the equivalent probability distribution curve for the normal distribution, based on the data sample's mean and standard deviation. Visual examination of the plot is used, and the kurtosis is analyzed to determine if the distribution of the data is near normal. If the data is near normal, then a normal distribution model which adequately covers the set of drift data as observed is derived. This normal distribution will be used as the model for the drift of the device.

Sample counting is used to determine an acceptable normal distribution. The standard deviation of the group is computed. The number of times the samples are within 2 standard deviations of the mean is computed. The count is divided by the total number of

samples in the group to determine a percentage. If the percentage of data within 2 standard deviations of the mean is greater than 95.45%, the existing standard deviation is acceptable to be used for the encompassing normal distribution model. In case the percentage is less than required, the standard deviation should be enlarged. The required multiplier for the standard deviation in order to provide this coverage is termed the Normality Adjustment Factor (NAF). If no adjustment is required, the NAF is equal to one.

The coverage analysis is presented on page 99 of Attachment 2. Visual inspection shows a moderate kurtosis, as most of the data points are found within 1.5 standard deviations of the mean. Calculations using the table on page 99 of Attachment 2 show that 95.9% of the data is encompassed within 2 standard deviations of the mean. Therefore, it is concluded that a normal distribution is a conservative representation of the data, and thus NAF is equal to 1.

A1.6 Selection of Final Data Set

The devices in question are only calibrated to one setpoint. Therefore, all data points will be utilized and no further analysis is required in determining the final data set.

A1.7 Time-Dependency Analysis

Standard statistical analyses do not consider time-dependency. The following tests attempt to uncover any time-related performance and the impact of any time-dependency on the analysis.

Drift Interval Plot
A drift interval plot is an XY scatter plot that shows the data set plotted against the time interval between calibrations. It relies on visual inspection to discriminate the plot for any trend in the data to exhibit a time dependency. A prediction line can be added to this plot to aid in the analysis.

Page 100 of Attachment 2 shows the drift interval plot for this data set. The plot shows a scatter of drift values, both positive and negative around the 1.5 and 3 month calibration intervals. As these were the most common intervals, most of the data points are found near these two time periods. Based on the equation of the regression line, there may be a slight time-dependency present. The drift interval plot includes the tolerance interval (TI). This tolerance interval is equal to the random drift term calculated in section A1.9.

Standard Deviations and Means at Different Calibration Intervals (Binning Analysis)
The binning analysis is the most recommended method of determining time dependent tendencies in a given sample pool. Following the instructions in step 4.8.3 of Input 12, the drift data was segregated into different groups (bins) corresponding to different ranges of calibration intervals. In order for further analysis to be done, at least 2 valid bins must exist. In order to be considered valid, a bin must contain more than five data points and more than 10% of the total data count. The binning analysis (Attachment 2, pages 101-123) shows that only 1 valid bin exists. Therefore, per the criteria in Input 12, the data will be established as moderately time dependent for the purposes of extrapolation of the drift value.

Due to the fact that multiple valid bins did not exist in the binning analysis, no further time-dependency testing is available.

A1.8 Drift Bias Determination

The absolute value of the average calculated drift for the trip units is 0.009 psid. Similarly, the absolute value of the average calculated drift is less than 0.1% of the calibrated span (200 psid). Based on the criteria of ESM-03.02-APP-III, it is concluded that the instrument drift does not have a bias. Therefore, the drift bias terms will be taken as 0 in this analysis.

A1.9 Analyzed Drift Value

Bias Term
Based on the section A1.8, the instruments do not have a bias. Therefore, the bias term will be equal to 0.

Random Term
The random term of the analyzed drift value is calculated with the below equation:

$$AD_{random} = s \times TIF \times NAF$$

where AD_{random} = random term for analyzed drift
s = drift standard deviation
TIF = 95%/95% tolerance interval factor
NAF = Normality Adjustment factor

The value of TIF is obtained from Table 9.1 of ESM-03.02-APP-III. Based on a sample size of 1094, TIF is equal to 1.960. From the coverage analysis, NAF was determined to be 1. From page 49 of Attachment 2, the standard deviation of the sample is 0.88. Thus the random term is equal to 1.73 psid.

30-Month Predicted Drift (Random Term)
Since the drift was determined to be moderately time dependent, the following equation was used to extrapolate the drift uncertainty:

$$AD_{E.random} = AD_{random} \times \sqrt{\frac{CI_E}{CI_O}}$$

where $AD_{E.random}$ = extended period drift term
AD_{random} = random term for analyzed drift
CI_E = extended calibration interval (surveillance interval +25%)
CI_O = average observed calibration time interval from bin with longest time interval

The value of the random term for the analyzed drift was determined to be 1.73 psid. The extended calibration interval is equal to the surveillance calibration interval (3 months) plus an additional 25% (0.75 months). Therefore, CI_E is equal to 3.75 months. CI_O is

determined from a valid bin of data with the longest calibration interval. There was only one valid bin, with a calibration interval range of 1.25 to 3.75 months. The average calibration interval within this bin is equal to 2.8 months. These values produce a 30-month predicted drift term of 2.00 psid.

Per the criteria in step 5.10.4.B, a check was made to ensure that the calculated 30-month predicted drift uncertainty is greater than the uncertainty calculated with the 99%/95% tolerance factor. Based on the large sample size (> 1000 data points), the TIF for 99%/95% is equal to the TIF for 95%/95%. The uncertainty calculated using the 99%/95% TIF of 1.960 is 1.73 psid.

Therefore, the 30-month predicted drift uncertainty is 2.00 psid.

Drift Data for DPIS-2-116A

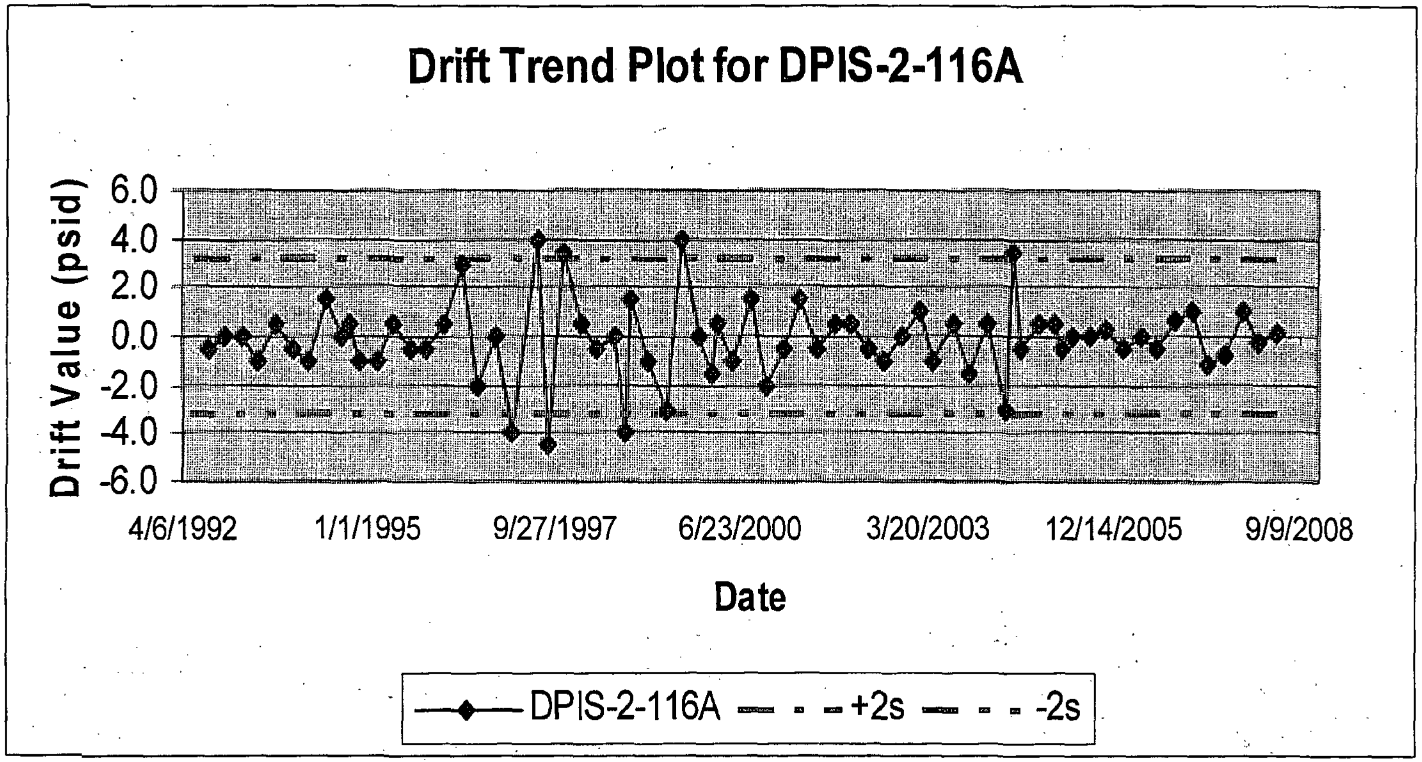
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	140.9	140.9	0.1	0.05
2/4/2008	2.7	140.8	140.8	-0.2	-0.10
11/15/2007	3.3	141.0	141.0	1.0	0.50
8/6/2007	3.0	140.0	140.0	-0.8	-0.40
5/7/2007	2.9	140.8	140.8	-1.2	-0.60
2/8/2007	3.1	142.0	142.0	1.0	0.50
11/6/2006	3.0	141.0	141.0	0.7	0.35
8/7/2006	3.0	140.3	140.3	-0.5	-0.25
5/8/2006	3.0	140.8	140.8	0.0	0.00
2/6/2006	3.2	140.8	140.8	-0.5	-0.25
10/31/2005	3.0	141.3	141.3	0.3	0.15
8/1/2005	3.0	141.0	141.0	0.0	0.00
5/2/2005	1.7	141.0	141.0	0.0	0.00
3/10/2005	1.2	141.0	141.0	-0.5	-0.25
1/31/2005	3.0	141.5	141.5	0.5	0.25
11/1/2004	3.0	141.0	141.0	0.5	0.25
8/2/2004	1.4	140.5	140.5	-0.5	-0.25
6/20/2004	1.6	142.0	141.0	3.5	1.75
5/3/2004	3.0	138.5	138.5	-3.0	-1.50
2/2/2004	3.0	141.5	141.5	0.5	0.25
11/3/2003	3.0	141.0	141.0	-1.5	-0.75
8/4/2003	3.4	142.5	142.5	0.5	0.25
4/23/2003	2.6	142.0	142.0	-1.0	-0.50
2/3/2003	3.0	143.0	143.0	1.0	0.50
11/4/2002	3.0	142.0	142.0	0.0	0.00
8/5/2002	3.0	142.0	142.0	-1.0	-0.50
5/6/2002	3.0	143.0	143.0	-0.5	-0.25
2/4/2002	3.0	143.5	143.5	0.5	0.25
11/6/2001	2.9	143.0	143.0	0.5	0.25
8/10/2001	3.1	142.5	142.5	-0.5	-0.25
5/7/2001	3.0	143.0	143.0	1.5	0.75
2/5/2001	3.0	141.5	141.5	-0.5	-0.25
11/6/2000	3.0	142.0	142.0	-2.0	-1.00
8/7/2000	3.0	144.0	144.0	1.5	0.75
5/9/2000	2.9	142.5	142.5	-1.0	-0.50
2/11/2000	0.7	143.5	143.5	0.5	0.25
1/20/2000	2.4	143.0	143.0	-1.5	-0.75
11/8/1999	3.0	144.5	144.5	0.0	0.00
8/9/1999	3.0	144.5	144.5	4.0	2.00
5/10/1999	3.0	140.5	140.5	-3.0	-1.50
2/8/1999	3.0	143.5	143.5	-1.0	-0.50
11/9/1998	1.3	144.5	144.5	1.5	0.75
9/30/1998	1.7	121.0	143.0	-4.0	-2.00

8/10/1998	3.0	125.0	125.0	0.0	0.00
5/12/1998	2.9	125.0	125.0	-0.5	-0.25
2/12/1998	3.0	125.5	125.5	0.5	0.25
11/11/1997	3.0	125.0	125.0	3.5	1.75
8/11/1997	1.4	121.5	121.5	-4.5	-2.25
6/30/1997	4.6	126.0	126.0	4.0	2.00
2/10/1997	3.0	122.0	122.0	-4.0	-2.00
11/11/1996	3.0	126.0	126.0	0.0	0.00
8/13/1996	2.7	126.0	126.0	-2.0	-1.00
5/24/1996	3.3	128.0	128.0	3.0	1.50
2/13/1996	3.0	125.0	125.0	0.5	0.25
11/13/1995	3.0	124.5	124.5	-0.5	-0.25
8/15/1995	3.0	125.0	125.0	-0.5	-0.25
5/15/1995	3.0	125.5	125.5	0.5	0.25
2/13/1995	3.0	125.0	125.0	-1.0	-0.50
11/15/1994	1.6	126.0	126.0	-1.0	-0.50
9/26/1994	1.4	127.0	127.0	0.5	0.25
8/15/1994	3.0	126.5	126.5	0.0	0.00
5/17/1994	3.0	126.5	126.5	1.5	0.75
2/15/1994	3.0	125.0	125.0	-1.0	-0.50
11/16/1993	3.0	126.0	126.0	-0.5	-0.25
8/17/1993	3.0	126.5	126.5	0.5	0.25
5/18/1993	2.9	126.0	126.0	-1.0	-0.50
2/19/1993	3.0	127.0	127.0	0.0	0.00
11/19/1992	3.0	127.0	127.0	0.0	0.00
8/18/1992	3.0	127.0	127.0	-0.5	-0.25
5/18/1992		127.5	127.5		

Basic Statistics for DPIS-2-116A

Average	$\bar{x}$	(psid)	-0.1
Standard Deviation	s	(psid)	1.61
Variance	s^2	(psid)	2.59
Largest Positive Drift		(psid)	4.0
Largest Negative Drift		(psid)	-4.5
Number of Samples	n		69

Average	$\bar{x}$	(%)	-0.06
Standard Deviation	s	(%)	0.80
Largest Positive Drift		(%)	2.00
Largest Negative Drift		(%)	-2.25


Drift Trend Plot for DPIS-2-116A
Drift Value (psid)
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-116A
+2s
-2s

Drift Data for DPIS-2-116B

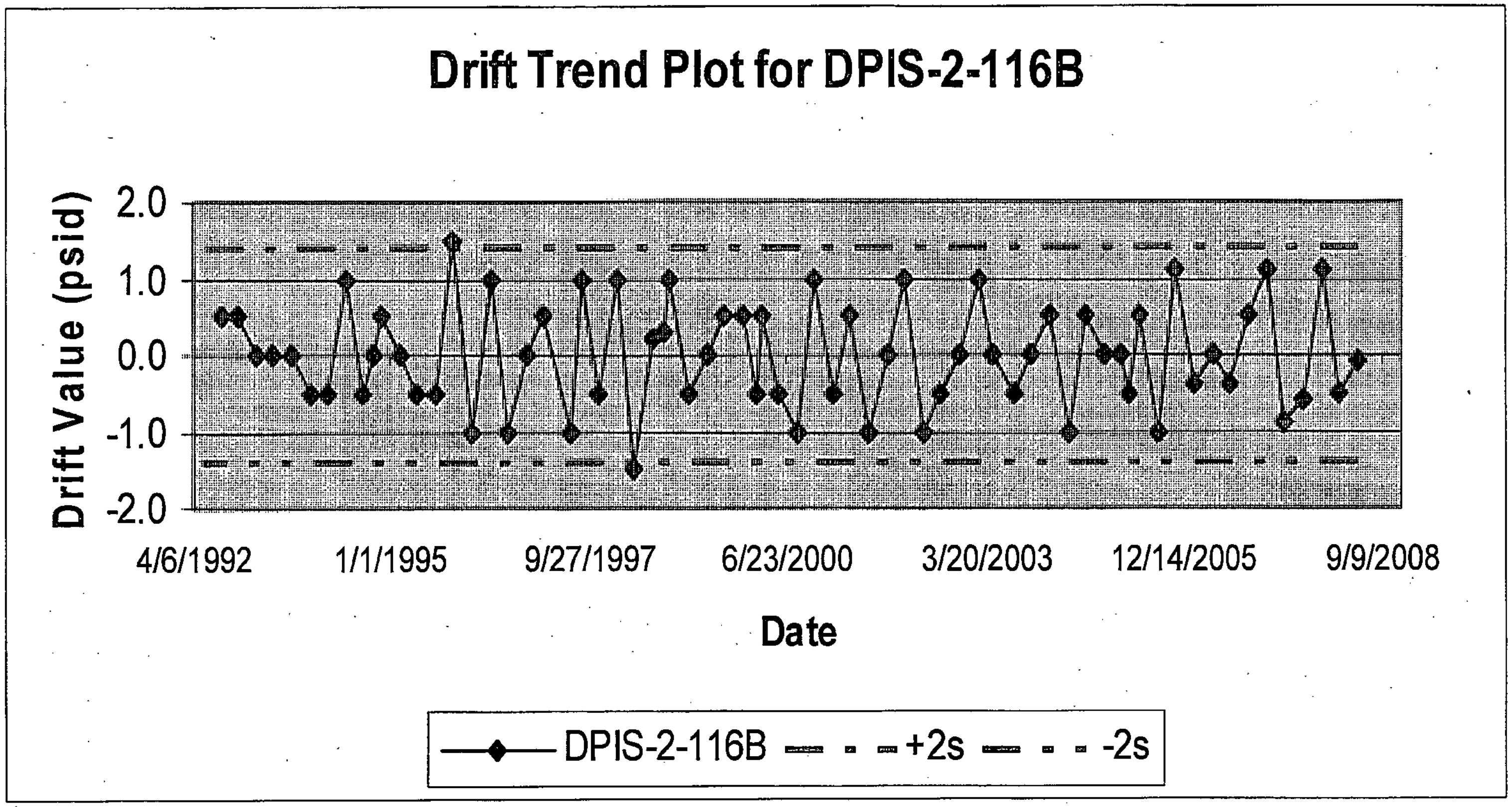
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.4	141.4	-0.1	-0.05
2/5/2008	2.7	141.5	141.5	-0.5	-0.25
11/15/2007	3.3	142.0	142.0	1.1	0.55
8/6/2007	3.0	140.9	140.9	-0.6	-0.30
5/7/2007	2.9	141.5	141.5	-0.9	-0.45
2/8/2007	3.1	142.4	142.4	1.1	0.55
11/6/2006	3.0	141.3	141.3	0.5	0.25
8/7/2006	3.0	140.8	140.8	-0.4	-0.20
5/8/2006	3.0	141.2	141.2	0.0	0.00
2/6/2006	3.2	141.2	141.2	-0.4	-0.20
10/31/2005	3.0	141.6	141.6	1.1	0.55
8/1/2005	3.0	140.5	140.5	-1.0	-0.50
5/2/2005	1.7	141.5	141.5	0.5	0.25
3/11/2005	1.3	141.0	141.0	-0.5	-0.25
1/31/2005	3.0	141.5	141.5	0.0	0.00
11/1/2004	3.0	141.5	141.5	0.0	0.00
8/2/2004	3.0	141.5	141.5	0.5	0.25
5/3/2004	3.0	141.0	141.0	-1.0	-0.50
2/2/2004	3.0	142.0	142.0	0.5	0.25
11/3/2003	3.0	141.5	141.5	0.0	0.00
8/4/2003	3.4	141.5	141.5	-0.5	-0.25
4/23/2003	2.6	142.0	142.0	0.0	0.00
2/3/2003	3.0	142.0	142.0	1.0	0.50
11/4/2002	3.0	141.0	141.0	0.0	0.00
8/5/2002	3.0	141.0	141.0	-0.5	-0.25
5/6/2002	3.0	141.5	141.5	-1.0	-0.50
2/4/2002	3.0	142.5	142.5	1.0	0.50
11/6/2001	2.9	141.5	141.5	0.0	0.00
8/10/2001	3.1	141.5	141.5	-1.0	-0.50
5/7/2001	3.0	142.5	142.5	0.5	0.25
2/5/2001	3.0	142.0	142.0	-0.5	-0.25
11/6/2000	3.0	142.5	142.5	1.0	0.50
8/7/2000	3.0	141.5	141.5	-1.0	-0.50
5/9/2000	2.9	142.5	142.5	-0.5	-0.25
2/11/2000	0.7	143.0	143.0	0.5	0.25
1/21/2000	2.4	142.5	142.5	-0.5	-0.25
11/8/1999	3.0	143.0	143.0	0.5	0.25
8/9/1999	3.0	142.5	142.5	0.5	0.25
5/10/1999	3.0	142.0	142.0	0.0	0.00
2/8/1999	3.0	142.0	142.0	-0.5	-0.25
11/9/1998	1.3	142.5	142.5	1.0	0.50
9/30/1998	1.7	123.5	141.5	0.3	0.15
8/10/1998	3.0	123.2	123.2	0.2	0.10

5/12/1998	2.9	123.0	123.0	-1.5	-0.75
2/12/1998	3.0	124.5	124.5	1.0	0.50
11/11/1997	3.0	123.5	123.5	-0.5	-0.25
8/11/1997	1.4	124.0	124.0	1.0	0.50
6/30/1997	4.6	123.0	123.0	-1.0	-0.50
2/10/1997	3.0	124.0	124.0	0.5	0.25
11/11/1996	3.0	123.5	123.5	0.0	0.00
8/13/1996	2.7	123.5	123.5	-1.0	-0.50
5/24/1996	3.3	124.5	124.5	1.0	0.50
2/13/1996	3.0	123.5	123.5	-1.0	-0.50
11/13/1995	3.0	124.5	124.5	1.5	0.75
8/15/1995	3.0	123.0	123.0	-0.5	-0.25
5/15/1995	3.0	123.5	123.5	-0.5	-0.25
2/13/1995	3.0	124.0	124.0	0.0	0.00
11/15/1994	1.5	124.0	124.0	0.5	0.25
9/29/1994	1.5	123.5	123.5	0.0	0.00
8/15/1994	3.0	123.5	123.5	-0.5	-0.25
5/17/1994	3.0	124.0	124.0	1.0	0.50
2/15/1994	3.0	123.0	123.0	-0.5	-0.25
11/16/1993	3.0	123.5	123.5	-0.5	-0.25
8/17/1993	3.0	124.0	124.0	0.0	0.00
5/18/1993	2.9	124.0	124.0	0.0	0.00
2/19/1993	3.0	124.0	124.0	0.0	0.00
11/19/1992	3.0	124.0	124.0	0.5	0.25
8/18/1992	3.0	123.5	123.5	0.5	0.25
5/18/1992		123.0	123.0		

Basic Statistics for LIS-2-3-657B

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.69
Variance	s^2	(psid)	0.48
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.35
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-116B
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-116B
+2s
-2s

Drift Data for DPIS-2-116C

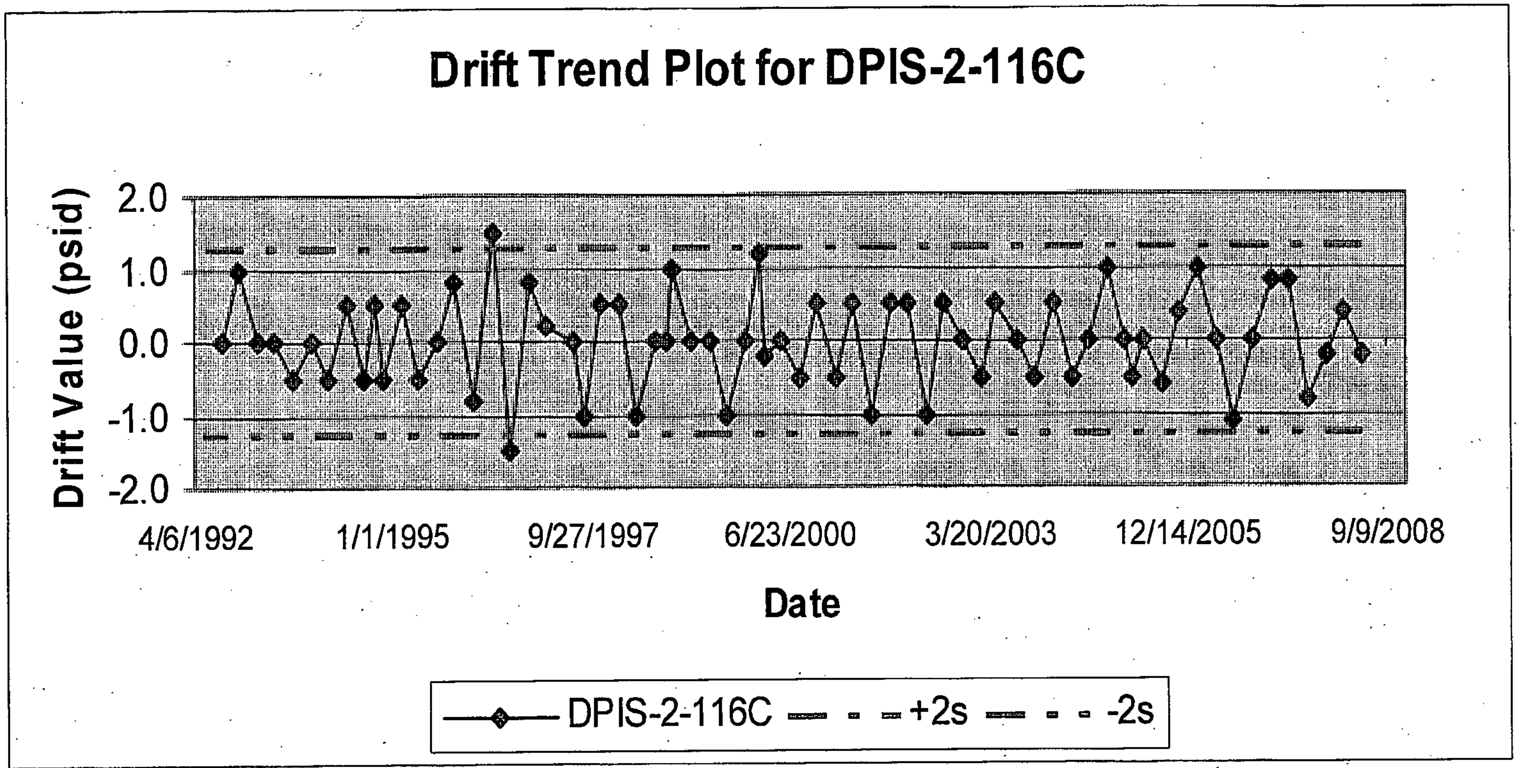
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	142.0	142.0	-0.2	-0.10
2/5/2008	2.7	142.2	142.2	0.4	0.20
11/15/2007	3.3	141.8	141.8	-0.2	-0.10
8/6/2007	3.0	142.0	142.0	-0.8	-0.40
5/7/2007	2.9	142.8	142.8	0.8	0.40
2/8/2007	3.1	142.0	142.0	0.8	0.40
11/6/2006	3.0	141.2	141.2	0.0	0.00
8/7/2006	3.0	141.2	141.2	-1.1	-0.55
5/8/2006	3.0	142.3	142.3	0.0	0.00
2/6/2006	3.2	142.3	142.3	1.0	0.50
10/31/2005	3.0	141.3	141.3	0.4	0.20
8/1/2005	3.0	140.9	140.9	-0.6	-0.30
5/2/2005	1.7	141.5	141.5	0.0	0.00
3/11/2005	1.3	141.5	141.5	-0.5	-0.25
1/31/2005	3.0	142.0	142.0	0.0	0.00
11/1/2004	3.0	142.0	142.0	1.0	0.50
8/2/2004	3.0	141.0	141.0	0.0	0.00
5/3/2004	3.0	141.0	141.0	-0.5	-0.25
2/2/2004	3.0	141.5	141.5	0.5	0.25
11/3/2003	3.0	141.0	141.0	-0.5	-0.25
8/4/2003	3.4	141.5	141.5	0.0	0.00
4/23/2003	2.6	144.5	141.5	0.5	0.25
2/3/2003	3.0	144.0	144.0	-0.5	-0.25
11/4/2002	3.0	144.5	144.5	0.0	0.00
8/5/2002	3.0	144.5	144.5	0.5	0.25
5/6/2002	3.0	144.0	144.0	-1.0	-0.50
2/4/2002	3.0	145.0	145.0	0.5	0.25
11/6/2001	2.9	144.5	144.5	0.5	0.25
8/10/2001	3.1	144.0	144.0	-1.0	-0.50
5/7/2001	3.0	145.0	145.0	0.5	0.25
2/5/2001	3.0	144.5	144.5	-0.5	-0.25
11/6/2000	3.0	145.0	145.0	0.5	0.25
8/7/2000	3.0	144.5	144.5	-0.5	-0.25
5/9/2000	2.9	145.0	145.0	0.0	0.00
2/11/2000	0.7	145.0	145.0	-0.2	-0.10
1/21/2000	2.4	145.2	145.2	1.2	0.60
11/8/1999	3.0	144.0	144.0	0.0	0.00
8/9/1999	3.0	144.0	144.0	-1.0	-0.50
5/10/1999	3.0	145.0	145.0	0.0	0.00
2/8/1999	3.0	145.0	145.0	0.0	0.00
11/9/1998	1.3	145.0	145.0	1.0	0.50
9/30/1998	1.7	127.0	144.0	0.0	0.00
8/10/1998	3.0	127.0	127.0	0.0	0.00

5/12/1998	2.9	127.0	127.0	-1.0	-0.50
2/12/1998	3.0	128.0	128.0	0.5	0.25
11/11/1997	3.0	127.5	127.5	0.5	0.25
8/11/1997	1.4	127.0	127.0	-1.0	-0.50
6/30/1997	4.6	128.0	128.0	0.0	0.00
2/10/1997	3.0	128.0	128.0	0.2	0.10
11/11/1996	3.0	127.8	127.8	0.8	0.40
8/13/1996	2.7	127.0	127.0	-1.5	-0.75
5/24/1996	3.3	128.5	128.5	1.5	0.75
2/13/1996	3.0	127.0	127.0	-0.8	-0.40
11/13/1995	3.0	127.8	127.8	0.8	0.40
8/15/1995	3.0	127.0	127.0	0.0	0.00
5/15/1995	3.0	127.0	127.0	-0.5	-0.25
2/13/1995	3.0	127.5	127.5	0.5	0.25
11/15/1994	1.6	127.0	127.0	-0.5	-0.25
9/28/1994	1.4	127.5	127.5	0.5	0.25
8/15/1994	3.0	127.0	127.0	-0.5	-0.25
5/17/1994	3.0	127.5	127.5	0.5	0.25
2/15/1994	3.0	127.0	127.0	-0.5	-0.25
11/16/1993	3.0	127.5	127.5	0.0	0.00
8/17/1993	3.0	127.5	127.5	-0.5	-0.25
5/18/1993	2.9	128.0	128.0	0.0	0.00
2/19/1993	3.0	128.0	128.0	0.0	0.00
11/19/1992	3.0	128.0	128.0	1.0	0.50
8/18/1992	3.0	127.0	127.0	0.0	0.00
5/18/1992		127.0	127.0		

Basic Statistics for DPIS-2-116C

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.63
Variance	s^2	(psid)	0.40
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.01
Standard Deviation	s	(%)	0.31
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-116C
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-116C
+2s
-2s

Drift Data for DPIS-2-116D

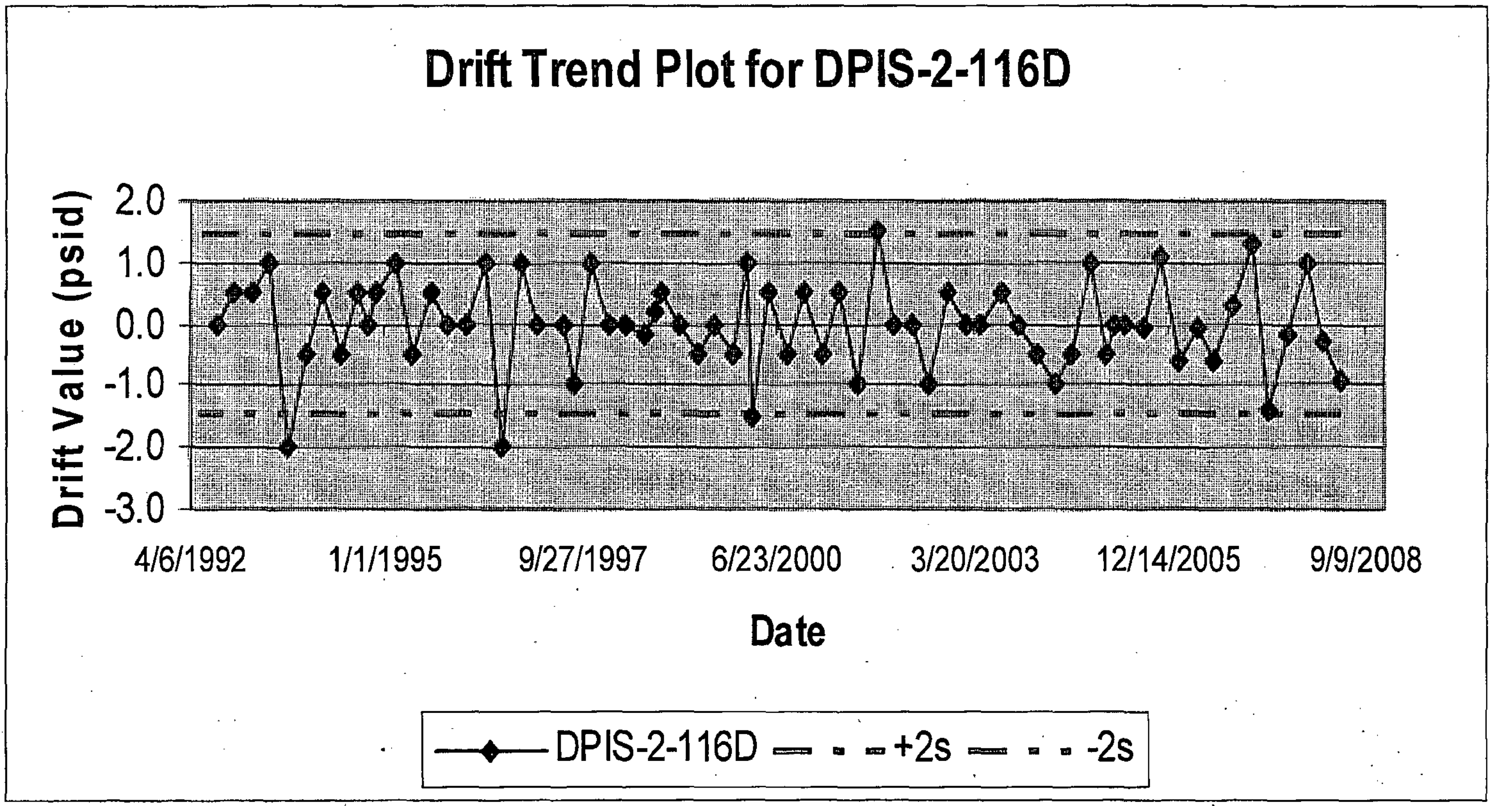
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	140.0	140.0	-0.9	-0.45
2/5/2008	2.7	140.9	140.9	-0.3	-0.15
11/15/2007	3.3	141.2	141.2	1.0	0.50
8/6/2007	3.0	140.2	140.2	-0.2	-0.10
5/7/2007	2.9	140.4	140.4	-1.4	-0.70
2/8/2007	3.1	141.8	141.8	1.3	0.65
11/6/2006	3.0	140.5	140.5	0.3	0.15
8/7/2006	3.0	140.2	140.2	-0.6	-0.30
5/8/2006	3.0	140.8	140.8	-0.1	-0.05
2/6/2006	3.2	140.9	140.9	-0.6	-0.30
10/31/2005	3.0	141.5	141.5	1.1	0.55
8/1/2005	3.0	140.4	140.4	-0.1	-0.05
5/2/2005	1.6	140.5	140.5	0.0	0.00
3/13/2005	1.3	140.5	140.5	0.0	0.00
1/31/2005	3.0	140.5	140.5	-0.5	-0.25
11/1/2004	3.0	141.0	141.0	1.0	0.50
8/2/2004	3.0	140.0	140.0	-0.5	-0.25
5/3/2004	3.0	140.5	140.5	-1.0	-0.50
2/2/2004	3.0	141.5	141.5	-0.5	-0.25
11/3/2003	3.0	142.0	142.0	0.0	0.00
8/4/2003	3.4	142.0	142.0	0.5	0.25
4/23/2003	2.6	141.5	141.5	0.0	0.00
2/3/2003	3.0	141.5	141.5	0.0	0.00
11/4/2002	3.0	141.5	141.5	0.5	0.25
8/5/2002	3.0	141.0	141.0	-1.0	-0.50
5/6/2002	3.0	142.0	142.0	0.0	0.00
2/4/2002	3.0	142.0	142.0	0.0	0.00
11/6/2001	2.9	142.0	142.0	1.5	0.75
8/10/2001	3.1	140.5	140.5	-1.0	-0.50
5/7/2001	3.0	141.5	141.5	0.5	0.25
2/5/2001	3.0	141.0	141.0	-0.5	-0.25
11/6/2000	3.0	141.5	141.5	0.5	0.25
8/7/2000	3.0	141.0	141.0	-0.5	-0.25
5/9/2000	2.9	141.5	141.5	0.5	0.25
2/11/2000	0.7	141.0	141.0	-1.5	-0.75
1/22/2000	2.5	142.5	142.5	1.0	0.50
11/8/1999	3.0	141.5	141.5	-0.5	-0.25
8/9/1999	3.0	142.0	142.0	0.0	0.00
5/10/1999	3.0	142.0	142.0	-0.5	-0.25
2/8/1999	3.0	142.5	142.5	0.0	0.00
11/9/1998	1.3	142.5	142.5	0.5	0.25
9/30/1998	1.7	123.0	142.0	0.2	0.10
8/10/1998	3.0	122.8	122.8	-0.2	-0.10

5/12/1998	2.9	123.0	123.0	0.0	0.00
2/12/1998	3.0	123.0	123.0	0.0	0.00
11/11/1997	3.0	123.0	123.0	1.0	0.50
8/11/1997	1.4	122.0	122.0	-1.0	-0.50
6/30/1997	4.6	123.0	123.0	0.0	0.00
2/10/1997	3.0	123.0	123.0	0.0	0.00
11/11/1996	3.0	123.0	123.0	1.0	0.50
8/13/1996	2.7	122.0	122.0	-2.0	-1.00
5/24/1996	3.3	124.0	124.0	1.0	0.50
2/13/1996	3.0	123.0	123.0	0.0	0.00
11/13/1995	3.0	123.0	123.0	0.0	0.00
8/15/1995	3.0	123.0	123.0	0.5	0.25
5/15/1995	3.0	122.5	122.5	-0.5	-0.25
2/13/1995	3.0	123.0	123.0	1.0	0.50
11/15/1994	1.5	122.0	122.0	0.5	0.25
9/29/1994	1.5	123.0	121.5	0.0	0.00
8/15/1994	3.0	124.0	123.0	0.5	0.25
5/17/1994	3.0	123.5	123.5	-0.5	-0.25
2/15/1994	3.0	124.0	124.0	0.5	0.25
11/16/1993	3.0	123.5	123.5	-0.5	-0.25
8/17/1993	3.0	124.0	124.0	-2.0	-1.00
5/18/1993	2.9	126.0	126.0	1.0	0.50
2/19/1993	3.0	125.0	125.0	0.5	0.25
11/19/1992	3.0	124.5	124.5	0.5	0.25
8/18/1992	3.0	124.0	124.0	0.0	0.00
5/18/1992		124.0	124.0		

Basic Statistics for DPIS-2-116D

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.74
Variance	s^2	(psid)	0.55
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-2.0
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.37
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-1.00


Drift Trend Plot for DPIS-2-116D
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
-3.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-116D
+2s
-2s

Drift Data for DPIS-2-117A

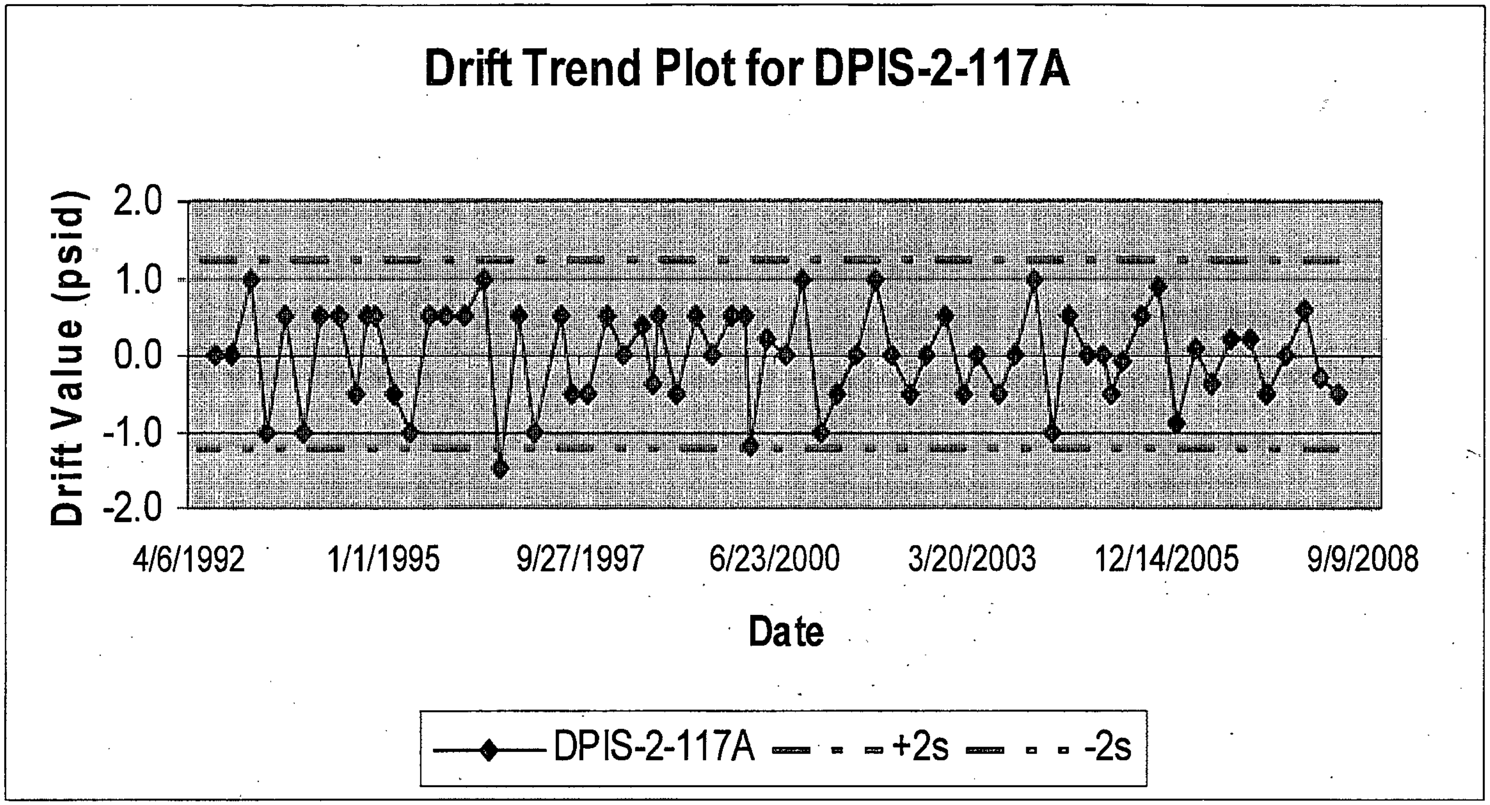
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.8	141.8	-0.5	-0.25
2/4/2008	2.7	142.3	142.3	-0.3	-0.15
11/15/2007	3.3	142.6	142.6	0.6	0.30
8/6/2007	3.0	142.0	142.0	0.0	0.00
5/7/2007	2.9	142.0	142.0	-0.5	-0.25
2/8/2007	3.1	142.5	142.5	0.2	0.10
11/6/2006	3.0	142.3	142.3	0.2	0.10
8/7/2006	3.0	142.1	142.1	-0.4	-0.20
5/8/2006	3.0	142.5	142.5	0.1	0.05
2/6/2006	3.2	142.4	142.4	-0.9	-0.45
10/31/2005	3.0	143.3	143.3	0.9	0.45
8/1/2005	3.0	142.4	142.4	0.5	0.25
5/2/2005	1.7	141.9	141.9	-0.1	-0.05
3/11/2005	1.3	142.0	142.0	-0.5	-0.25
1/31/2005	3.0	142.5	142.5	0.0	0.00
11/1/2004	3.0	142.5	142.5	0.0	0.00
8/2/2004	3.0	142.5	142.5	0.5	0.25
5/3/2004	3.0	142.0	142.0	-1.0	-0.50
2/2/2004	3.0	143.0	143.0	1.0	0.50
11/3/2003	3.0	142.0	142.0	0.0	0.00
8/4/2003	3.4	142.0	142.0	-0.5	-0.25
4/23/2003	2.6	142.5	142.5	0.0	0.00
2/3/2003	3.0	142.5	142.5	-0.5	-0.25
11/4/2002	3.0	143.0	143.0	0.5	0.25
8/5/2002	3.0	142.5	142.5	0.0	0.00
5/6/2002	3.0	142.5	142.5	-0.5	-0.25
2/4/2002	3.0	143.0	143.0	0.0	0.00
11/6/2001	2.9	143.0	143.0	1.0	0.50
8/10/2001	3.1	142.0	142.0	0.0	0.00
5/7/2001	3.0	142.0	142.0	-0.5	-0.25
2/5/2001	3.0	142.5	142.5	-1.0	-0.50
11/6/2000	3.0	143.5	143.5	1.0	0.50
8/7/2000	3.0	142.5	142.5	0.0	0.00
5/9/2000	2.9	142.5	142.5	0.2	0.10
2/11/2000	0.7	142.3	142.3	-1.2	-0.60
1/20/2000	2.4	143.5	143.5	0.5	0.25
11/8/1999	3.0	143.0	143.0	0.5	0.25
8/9/1999	3.0	142.5	142.5	0.0	0.00
5/10/1999	3.0	142.5	142.5	0.5	0.25
2/8/1999	3.0	142.0	142.0	-0.5	-0.25
11/9/1998	1.3	142.5	142.5	0.5	0.25
9/30/1998	1.7	125.0	142.0	-0.4	-0.20
8/10/1998	3.0	125.4	125.4	0.4	0.20

5/12/1998	2.9	125.0	125.0	0.0	0.00
2/12/1998	3.0	125.0	125.0	0.5	0.25
11/11/1997	3.0	124.5	124.5	-0.5	-0.25
8/11/1997	1.4	125.0	125.0	-0.5	-0.25
6/30/1997	4.6	125.5	125.5	0.5	0.25
2/10/1997	3.0	125.0	125.0	-1.0	-0.50
11/11/1996	3.0	126.0	126.0	0.5	0.25
8/13/1996	2.7	125.5	125.5	-1.5	-0.75
5/24/1996	3.3	127.0	127.0	1.0	0.50
2/13/1996	3.0	126.0	126.0	0.5	0.25
11/13/1995	3.0	125.5	125.5	0.5	0.25
8/15/1995	3.0	125.0	125.0	0.5	0.25
5/15/1995	3.0	124.5	124.5	-1.0	-0.50
2/13/1995	3.0	125.5	125.5	-0.5	-0.25
11/15/1994	1.6	126.0	126.0	0.5	0.25
9/27/1994	1.4	125.5	125.5	0.5	0.25
8/15/1994	3.0	125.0	125.0	-0.5	-0.25
5/17/1994	3.0	125.5	125.5	0.5	0.25
2/15/1994	3.0	125.0	125.0	0.5	0.25
11/16/1993	3.0	124.5	124.5	-1.0	-0.50
8/17/1993	3.0	125.5	125.5	0.5	0.25
5/18/1993	2.9	125.0	125.0	-1.0	-0.50
2/19/1993	3.0	126.0	126.0	1.0	0.50
11/19/1992	3.0	125.0	125.0	0.0	0.00
8/18/1992	3.0	125.0	125.0	0.0	0.00
5/18/1992		125.0	125.0		

Basic Statistics for DPIS-2-117A

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.61
Variance	s^2	(psid)	0.37
Largest Positive Drift		(psid)	1.0
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.30
Largest Positive Drift		(%)	0.50
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-117A
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-117A
+2s
-2s

Drift Data for DPIS-2-117B

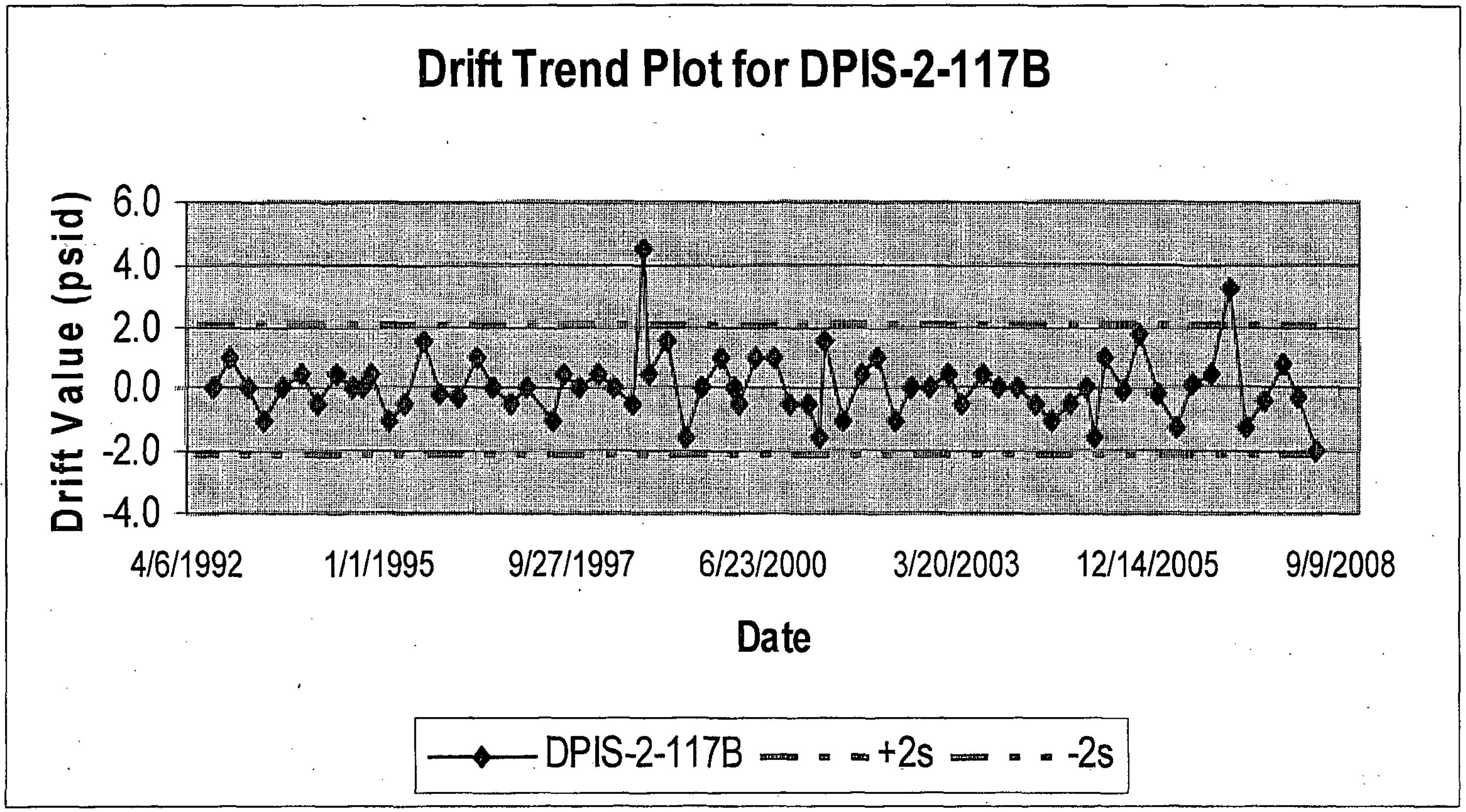
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.9	141.9	-2.0	-1.00
2/5/2008	2.7	143.9	143.9	-0.3	-0.15
11/15/2007	3.3	144.2	144.2	0.8	0.40
8/6/2007	3.0	143.4	143.4	-0.4	-0.20
5/7/2007	2.9	143.8	143.8	-1.2	-0.60
2/8/2007	3.1	145.0	145.0	3.2	1.60
11/6/2006	3.0	141.8	141.8	0.5	0.25
8/7/2006	3.0	141.3	141.3	0.1	0.05
5/8/2006	3.0	141.2	141.2	-1.2	-0.60
2/6/2006	3.2	142.4	142.4	-0.2	-0.10
10/31/2005	3.0	142.6	142.6	1.7	0.85
8/1/2005	3.0	140.9	140.9	-0.1	-0.05
5/2/2005	1.7	141.0	141.0	1.0	0.50
3/12/2005	1.3	140.0	140.0	-1.5	-0.75
1/31/2005	3.0	141.5	141.5	0.0	0.00
11/1/2004	3.0	141.5	141.5	-0.5	-0.25
8/2/2004	3.0	142.0	142.0	-1.0	-0.50
5/3/2004	3.0	143.0	143.0	-0.5	-0.25
2/2/2004	3.0	143.5	143.5	0.0	0.00
11/3/2003	3.0	143.5	143.5	0.0	0.00
8/4/2003	3.4	144.0	143.5	0.5	0.25
4/23/2003	2.6	143.5	143.5	-0.5	-0.25
2/3/2003	3.0	144.0	144.0	0.5	0.25
11/4/2002	3.0	143.5	143.5	0.0	0.00
8/5/2002	3.0	143.5	143.5	0.0	0.00
5/6/2002	3.0	143.5	143.5	-1.0	-0.50
2/4/2002	3.0	144.5	144.5	1.0	0.50
11/6/2001	2.9	143.5	143.5	0.5	0.25
8/10/2001	3.1	143.0	143.0	-1.0	-0.50
5/7/2001	1.2	144.0	144.0	1.5	0.75
3/31/2001	1.8	144.0	142.5	-1.5	-0.75
2/5/2001	3.0	145.5	145.5	-0.5	-0.25
11/6/2000	3.0	146.0	146.0	-0.5	-0.25
8/7/2000	3.0	146.5	146.5	1.0	0.50
5/9/2000	2.9	145.5	145.5	1.0	0.50
2/11/2000	0.7	144.5	144.5	-0.5	-0.25
1/21/2000	2.4	145.0	145.0	0.0	0.00
11/8/1999	3.0	145.0	145.0	1.0	0.50
8/9/1999	3.0	144.0	144.0	0.0	0.00
5/10/1999	3.0	144.0	144.0	-1.5	-0.75
2/8/1999	3.0	145.5	145.5	1.5	0.75
11/9/1998	1.3	144.0	144.0	0.5	0.25
9/30/1998	1.7	128.0	143.5	4.5	2.25

8/10/1998	3.0	123.5	123.5	-0.5	-0.25
5/12/1998	2.9	124.0	124.0	0.0	0.00
2/12/1998	3.0	124.0	124.0	0.5	0.25
11/11/1997	3.0	123.5	123.5	0.0	0.00
8/11/1997	1.4	123.5	123.5	0.5	0.25
6/30/1997	4.6	123.0	123.0	-1.0	-0.50
2/10/1997	3.0	124.0	124.0	0.0	0.00
11/11/1996	3.0	124.0	124.0	-0.5	-0.25
8/13/1996	2.7	124.5	124.5	0.0	0.00
5/24/1996	3.3	124.5	124.5	1.0	0.50
2/13/1996	3.0	123.5	123.5	-0.3	-0.15
11/13/1995	3.0	123.8	123.8	-0.2	-0.10
8/15/1995	3.0	124.0	124.0	1.5	0.75
5/15/1995	3.0	122.5	122.5	-0.5	-0.25
2/13/1995	3.0	123.0	123.0	-1.0	-0.50
11/15/1994	1.5	124.0	124.0	0.5	0.25
9/29/1994	1.5	123.5	123.5	0.0	0.00
8/15/1994	3.0	123.5	123.5	0.0	0.00
5/17/1994	3.0	123.5	123.5	0.5	0.25
2/15/1994	3.0	123.0	123.0	-0.5	-0.25
11/16/1993	3.0	123.5	123.5	0.5	0.25
8/17/1993	3.0	123.0	123.0	0.0	0.00
5/18/1993	2.9	123.0	123.0	-1.0	-0.50
2/19/1993	3.0	124.0	124.0	0.0	0.00
11/19/1992	3.0	124.0	124.0	1.0	0.50
8/18/1992	3.0	123.0	123.0	0.0	0.00
5/18/1992		123.0	123.0		

Basic Statistics for DPIS-2-117B

Average	$\bar{x}$	(psid)	0.1
Standard Deviation	s	(psid)	1.03
Variance	s^2	(psid)	1.06
Largest Positive Drift		(psid)	4.5
Largest Negative Drift		(psid)	-2.0
Number of Samples	n		69

Average	$\bar{x}$	(%)	0.04
Standard Deviation	s	(%)	0.52
Largest Positive Drift		(%)	2.25
Largest Negative Drift		(%)	-1.00


Drift Trend Plot for DPIS-2-117B
Drift Value (psid)
6.0
4.0
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-117B
+2s
-2s

Drift Data for DPIS-2-117C

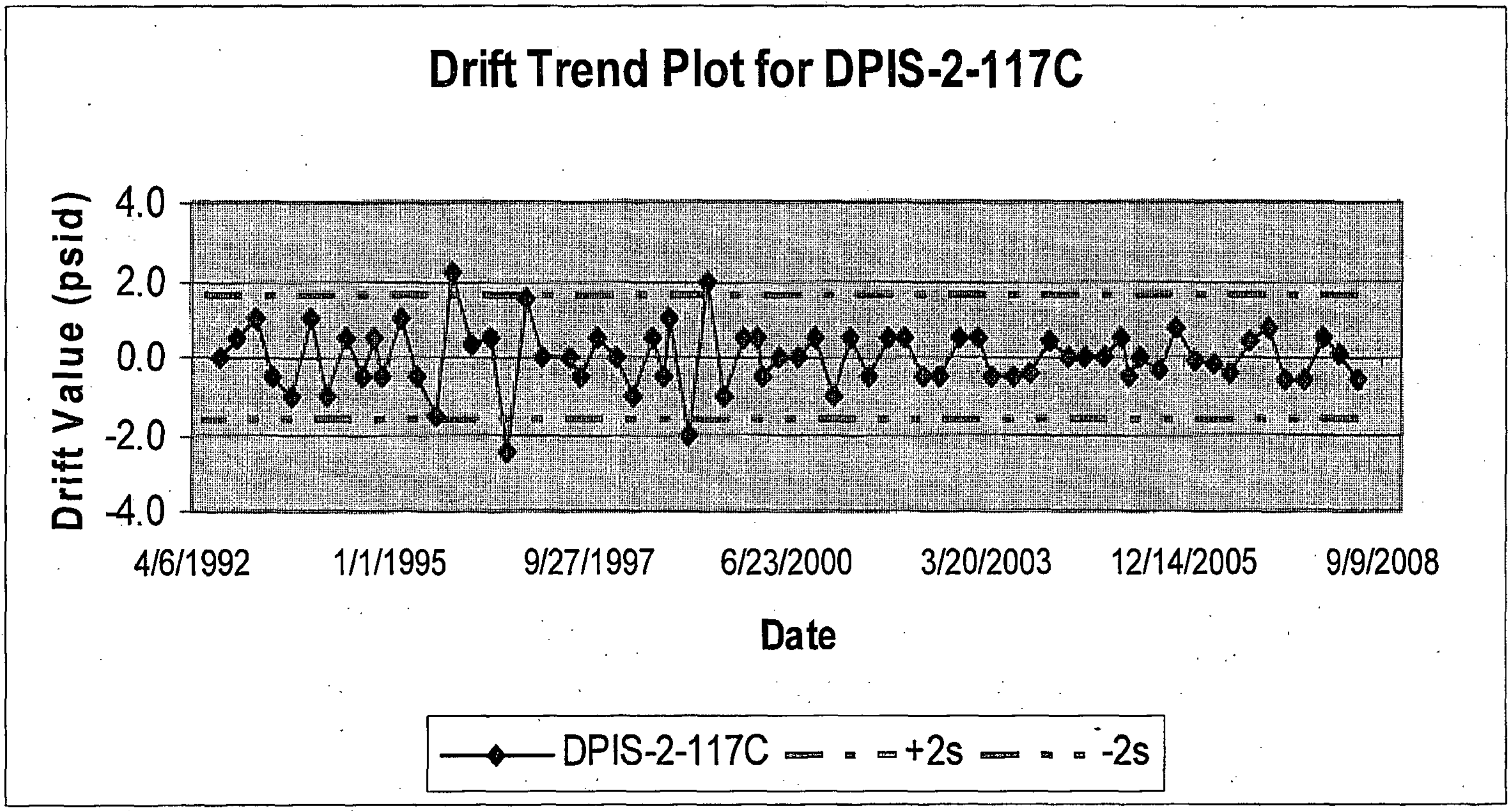
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	142.8	142.8	-0.6	-0.30
2/5/2008	2.7	143.4	143.4	0.1	0.05
11/15/2007	3.3	143.3	143.3	0.5	0.25
8/6/2007	3.0	142.8	142.8	-0.6	-0.30
5/7/2007	2.9	143.4	143.4	-0.6	-0.30
2/8/2007	3.1	144.0	144.0	0.8	0.40
11/6/2006	3.0	143.2	143.2	0.4	0.20
8/7/2006	3.0	142.8	142.8	-0.4	-0.20
5/8/2006	3.0	143.2	143.2	-0.2	-0.10
2/6/2006	3.2	143.4	143.4	-0.1	-0.05
10/31/2005	3.0	143.5	143.5	0.8	0.40
8/1/2005	3.0	142.7	142.7	-0.3	-0.15
5/2/2005	1.7	143.0	143.0	0.0	0.00
3/11/2005	1.3	143.0	143.0	-0.5	-0.25
1/31/2005	3.0	143.5	143.5	0.5	0.25
11/1/2004	3.0	143.0	143.0	0.0	0.00
8/2/2004	3.0	143.0	143.0	0.0	0.00
5/3/2004	3.0	143.0	143.0	0.0	0.00
2/2/2004	3.0	143.0	143.0	0.4	0.20
11/3/2003	3.0	142.6	142.6	-0.4	-0.20
8/4/2003	3.4	143.0	143.0	-0.5	-0.25
4/23/2003	2.6	143.5	143.5	-0.5	-0.25
2/3/2003	3.0	144.0	144.0	0.5	0.25
11/4/2002	3.0	143.5	143.5	0.5	0.25
8/5/2002	3.0	143.0	143.0	-0.5	-0.25
5/6/2002	3.0	143.5	143.5	-0.5	-0.25
2/4/2002	3.0	144.0	144.0	0.5	0.25
11/6/2001	2.9	143.5	143.5	0.5	0.25
8/10/2001	3.1	143.0	143.0	-0.5	-0.25
5/7/2001	3.0	143.5	143.5	0.5	0.25
2/5/2001	3.0	143.0	143.0	-1.0	-0.50
11/6/2000	3.0	144.0	144.0	0.5	0.25
8/7/2000	3.0	143.5	143.5	0.0	0.00
5/9/2000	2.9	143.5	143.5	0.0	0.00
2/11/2000	0.7	143.5	143.5	-0.5	-0.25
1/21/2000	2.4	144.0	144.0	0.5	0.25
11/8/1999	3.0	143.5	143.5	0.5	0.25
8/9/1999	3.0	143.0	143.0	-1.0	-0.50
5/10/1999	3.0	144.0	144.0	2.0	1.00
2/8/1999	3.0	142.0	142.0	-2.0	-1.00
11/9/1998	1.3	144.0	144.0	1.0	0.50
9/30/1998	1.7	125.0	143.0	-0.5	-0.25
8/10/1998	3.0	125.5	125.5	0.5	0.25

5/12/1998	2.9	125.0	125.0	-1.0	-0.50
2/12/1998	3.0	126.0	126.0	0.0	0.00
11/11/1997	3.0	126.0	126.0	0.5	0.25
8/11/1997	1.4	125.5	125.5	-0.5	-0.25
6/30/1997	4.6	126.0	126.0	0.0	0.00
2/10/1997	3.0	126.0	126.0	0.0	0.00
11/11/1996	3.0	126.0	126.0	1.5	0.75
8/13/1996	2.7	124.5	124.5	-2.5	-1.25
5/24/1996	3.3	127.0	127.0	0.5	0.25
2/13/1996	3.0	126.5	126.5	0.3	0.15
11/13/1995	3.0	126.2	126.2	2.2	1.10
8/15/1995	3.0	124.0	124.0	-1.5	-0.75
5/15/1995	3.0	125.5	125.5	-0.5	-0.25
2/13/1995	3.0	126.0	126.0	1.0	0.50
11/15/1994	1.6	125.0	125.0	-0.5	-0.25
9/28/1994	1.4	125.5	125.5	0.5	0.25
8/15/1994	3.0	125.0	125.0	-0.5	-0.25
5/17/1994	3.0	125.5	125.5	0.5	0.25
2/15/1994	3.0	125.0	125.0	-1.0	-0.50
11/16/1993	3.0	126.0	126.0	1.0	0.50
8/17/1993	3.0	125.0	125.0	-1.0	-0.50
5/18/1993	2.9	126.0	126.0	-0.5	-0.25
2/19/1993	3.0	126.5	126.5	1.0	0.50
11/19/1992	3.0	125.5	125.5	0.5	0.25
8/18/1992	3.0	125.0	125.0	0.0	0.00
5/18/1992		125.0	125.0		

Basic Statistics for DPIS-2-117C

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.80
Variance	s^2	(psid)	0.64
Largest Positive Drift		(psid)	2.2
Largest Negative Drift		(psid)	-2.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.40
Largest Positive Drift		(%)	1.10
Largest Negative Drift		(%)	-1.25



Drift Trend Plot for DPIS-2-117C
Drift Value (psid)
4.0
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-117C
+2s
-2s

Drift Data for DPIS-2-117D

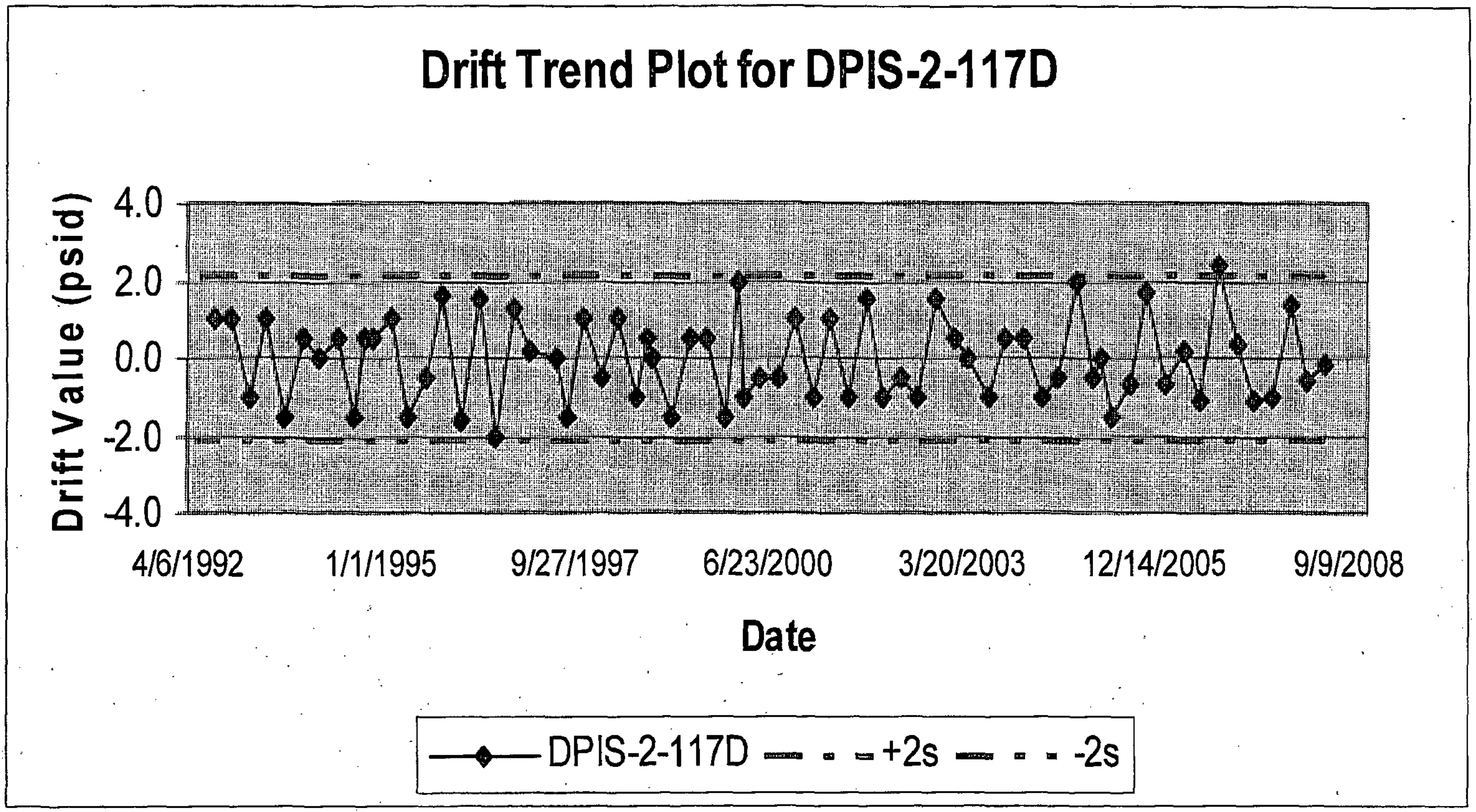
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	140.5	140.5	-0.2	-0.10
2/5/2008	2.7	140.7	140.7	-0.6	-0.30
11/15/2007	3.3	141.3	141.3	1.4	0.70
8/6/2007	2.9	139.9	139.9	-1.0	-0.50
5/9/2007	3.0	140.9	140.9	-1.1	-0.55
2/8/2007	3.1	142.0	142.0	0.3	0.15
11/6/2006	3.0	141.7	141.7	2.4	1.20
8/7/2006	3.0	139.9	139.3	-1.1	-0.55
5/8/2006	3.0	141.0	141.0	0.2	0.10
2/6/2006	3.2	140.8	140.8	-0.7	-0.35
10/31/2005	3.0	141.5	141.5	1.7	0.85
8/1/2005	3.0	139.8	139.8	-0.7	-0.35
5/2/2005	1.6	140.5	140.5	-1.5	-0.75
3/13/2005	1.3	142.0	142.0	0.0	0.00
1/31/2005	3.0	142.0	142.0	-0.5	-0.25
11/1/2004	3.0	142.5	142.5	2.0	1.00
8/2/2004	3.0	140.5	140.5	-0.5	-0.25
5/3/2004	3.0	141.0	141.0	-1.0	-0.50
2/2/2004	3.0	142.0	142.0	0.5	0.25
11/3/2003	3.0	141.5	141.5	0.5	0.25
8/4/2003	3.4	141.0	141.0	-1.0	-0.50
4/23/2003	2.6	142.0	142.0	0.0	0.00
2/3/2003	3.0	142.0	142.0	0.5	0.25
11/4/2002	3.0	141.5	141.5	1.5	0.75
8/5/2002	3.0	140.0	140.0	-1.0	-0.50
5/6/2002	3.0	141.0	141.0	-0.5	-0.25
2/4/2002	3.0	141.5	141.5	-1.0	-0.50
11/6/2001	2.9	142.5	142.5	1.5	0.75
8/10/2001	3.1	141.0	141.0	-1.0	-0.50
5/7/2001	3.0	142.0	142.0	1.0	0.50
2/5/2001	3.0	141.0	141.0	-1.0	-0.50
11/6/2000	3.0	142.0	142.0	1.0	0.50
8/7/2000	3.0	141.0	141.0	-0.5	-0.25
5/9/2000	2.9	141.5	141.5	-0.5	-0.25
2/11/2000	0.7	142.0	142.0	-1.0	-0.50
1/22/2000	2.5	143.0	143.0	2.0	1.00
11/8/1999	3.0	141.0	141.0	-1.5	-0.75
8/9/1999	3.0	142.5	142.5	0.5	0.25
5/10/1999	3.0	142.0	142.0	0.5	0.25
2/8/1999	3.0	141.5	141.5	-1.5	-0.75
11/9/1998	1.3	143.0	143.0	0.0	0.00
9/30/1998	1.7	122.5	143.0	0.5	0.25
8/10/1998	3.0	122.0	122.0	-1.0	-0.50

5/12/1998	2.9	123.0	123.0	1.0	0.50
2/12/1998	3.0	122.0	122.0	-0.5	-0.25
11/11/1997	3.0	122.5	122.5	1.0	0.50
8/11/1997	1.4	121.5	121.5	-1.5	-0.75
6/30/1997	4.6	123.0	123.0	0.0	0.00
2/10/1997	3.0	123.0	123.0	0.2	0.10
11/11/1996	3.0	122.8	122.8	1.3	0.65
8/13/1996	2.7	121.5	121.5	-2.0	-1.00
5/24/1996	3.3	123.5	123.5	1.5	0.75
2/13/1996	3.0	122.0	122.0	-1.6	-0.80
11/13/1995	3.0	123.6	123.6	1.6	0.80
8/15/1995	3.0	122.0	122.0	-0.5	-0.25
5/15/1995	3.0	122.5	122.5	-1.5	-0.75
2/13/1995	3.0	124.0	124.0	1.0	0.50
11/15/1994	1.5	123.0	123.0	0.5	0.25
9/29/1994	1.5	122.5	122.5	0.5	0.25
8/15/1994	3.0	122.0	122.0	-1.5	-0.75
5/17/1994	3.0	123.5	123.5	0.5	0.25
2/15/1994	3.0	123.0	123.0	0.0	0.00
11/16/1993	3.0	123.0	123.0	0.5	0.25
8/17/1993	3.0	122.5	122.5	-1.5	-0.75
5/18/1993	2.9	124.0	124.0	1.0	0.50
2/19/1993	3.0	123.0	123.0	-1.0	-0.50
11/19/1992	3.0	124.0	124.0	1.0	0.50
8/18/1992	3.0	123.0	123.0	1.0	0.50
5/18/1992		122.0	122.0		

Basic Statistics for DPIS-2-117D

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	1.08
Variance	s^2	(psid)	1.17
Largest Positive Drift		(psid)	2.4
Largest Negative Drift		(psid)	-2.0
Number of Samples	n		68

Average	$\bar{x}$	(%)	-0.01
Standard Deviation	s	(%)	0.54
Largest Positive Drift		(%)	1.20
Largest Negative Drift		(%)	-1.00


Drift Trend Plot for DPIS-2-117D
Drift Value (psid)
4.0
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-117D
+2s
-2s

Drift Data for DPIS-2-118A

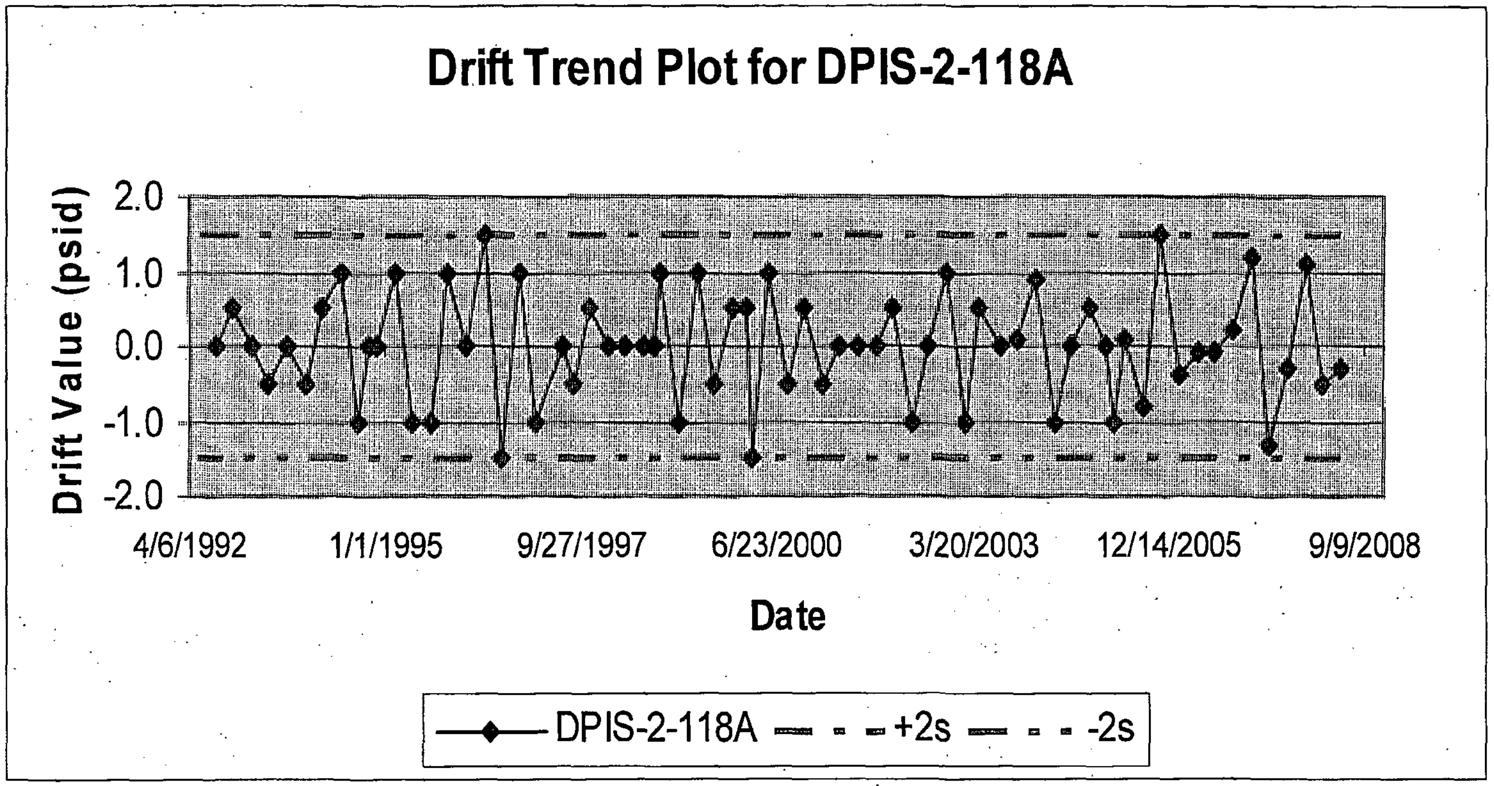
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	140.3	140.3	-0.3	-0.15
2/4/2008	2.7	140.6	140.6	-0.5	-0.25
11/15/2007	3.3	141.1	141.1	1.1	0.55
8/6/2007	3.0	140.0	140.0	-0.3	-0.15
5/7/2007	2.9	140.3	140.3	-1.3	-0.65
2/8/2007	3.1	141.6	141.6	1.2	0.60
11/6/2006	3.0	140.4	140.4	0.2	0.10
8/7/2006	3.0	140.2	140.2	-0.1	-0.05
5/8/2006	3.0	140.3	140.3	-0.1	-0.05
2/6/2006	3.2	140.4	140.4	-0.4	-0.20
10/31/2005	3.0	140.8	140.8	1.5	0.75
8/1/2005	3.0	139.3	139.3	-0.8	-0.40
5/2/2005	1.7	140.1	140.1	0.1	0.05
3/11/2005	1.3	140.0	140.0	-1.0	-0.50
1/31/2005	3.0	141.0	141.0	0.0	0.00
11/1/2004	3.0	141.0	141.0	0.5	0.25
8/2/2004	3.0	140.5	140.5	0.0	0.00
5/3/2004	3.0	140.5	140.5	-1.0	-0.50
2/2/2004	3.0	141.5	141.5	0.9	0.45
11/3/2003	3.0	140.6	140.6	0.1	0.05
8/4/2003	3.4	140.5	140.5	0.0	0.00
4/23/2003	2.6	145.0	140.5	0.5	0.25
2/3/2003	3.0	144.5	144.5	-1.0	-0.50
11/4/2002	3.0	145.5	145.5	1.0	0.50
8/5/2002	3.0	144.5	144.5	0.0	0.00
5/6/2002	3.0	144.5	144.5	-1.0	-0.50
2/4/2002	3.0	145.5	145.5	0.5	0.25
11/6/2001	2.9	145.0	145.0	0.0	0.00
8/10/2001	3.1	145.0	145.0	0.0	0.00
5/7/2001	3.0	145.0	145.0	0.0	0.00
2/5/2001	3.0	145.0	145.0	-0.5	-0.25
11/6/2000	3.0	145.5	145.5	0.5	0.25
8/7/2000	3.0	145.0	145.0	-0.5	-0.25
5/9/2000	2.9	145.5	145.5	1.0	0.50
2/11/2000	0.7	144.5	144.5	-1.5	-0.75
1/20/2000	2.4	146.0	146.0	0.5	0.25
11/8/1999	3.0	145.5	145.5	0.5	0.25
8/9/1999	3.0	145.0	145.0	-0.5	-0.25
5/10/1999	3.0	145.5	145.5	1.0	0.50
2/8/1999	3.0	144.5	144.5	-1.0	-0.50
11/9/1998	1.3	145.5	145.5	1.0	0.50
9/30/1998	1.7	127.0	144.5	0.0	0.00
8/10/1998	3.0	127.0	127.0	0.0	0.00

5/12/1998	2.9	127.0	127.0	0.0	0.00
2/12/1998	3.0	127.0	127.0	0.0	0.00
11/11/1997	3.0	127.0	127.0	0.5	0.25
8/11/1997	1.4	126.5	126.5	-0.5	-0.25
6/30/1997	4.6	127.0	127.0	0.0	0.00
2/10/1997	3.0	127.0	127.0	-1.0	-0.50
11/11/1996	3.0	128.0	128.0	1.0	0.50
8/13/1996	2.7	127.0	127.0	-1.5	-0.75
5/24/1996	3.3	128.5	128.5	1.5	0.75
2/13/1996	3.0	127.0	127.0	0.0	0.00
11/13/1995	3.0	127.0	127.0	1.0	0.50
8/15/1995	3.0	126.0	126.0	-1.0	-0.50
5/15/1995	3.0	127.0	127.0	-1.0	-0.50
2/13/1995	3.0	128.0	128.0	1.0	0.50
11/15/1994	1.6	127.0	127.0	0.0	0.00
9/27/1994	1.4	127.0	127.0	0.0	0.00
8/15/1994	3.0	127.0	127.0	-1.0	-0.50
5/17/1994	3.0	128.0	128.0	1.0	0.50
2/15/1994	3.0	127.0	127.0	0.5	0.25
11/16/1993	3.0	126.5	126.5	-0.5	-0.25
8/17/1993	3.0	127.0	127.0	0.0	0.00
5/18/1993	2.9	127.0	127.0	-0.5	-0.25
2/19/1993	3.0	127.5	127.5	0.0	0.00
11/19/1992	3.0	127.5	127.5	0.5	0.25
8/18/1992	3.0	127.0	127.0	0.0	0.00
5/18/1992		127.0	127.0		

Basic Statistics for DPIS-2-118A

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.74
Variance	s^2	(psid)	0.54
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.37
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-118A
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-118A
+2s
-2s

Drift Data for DPIS-2-118B

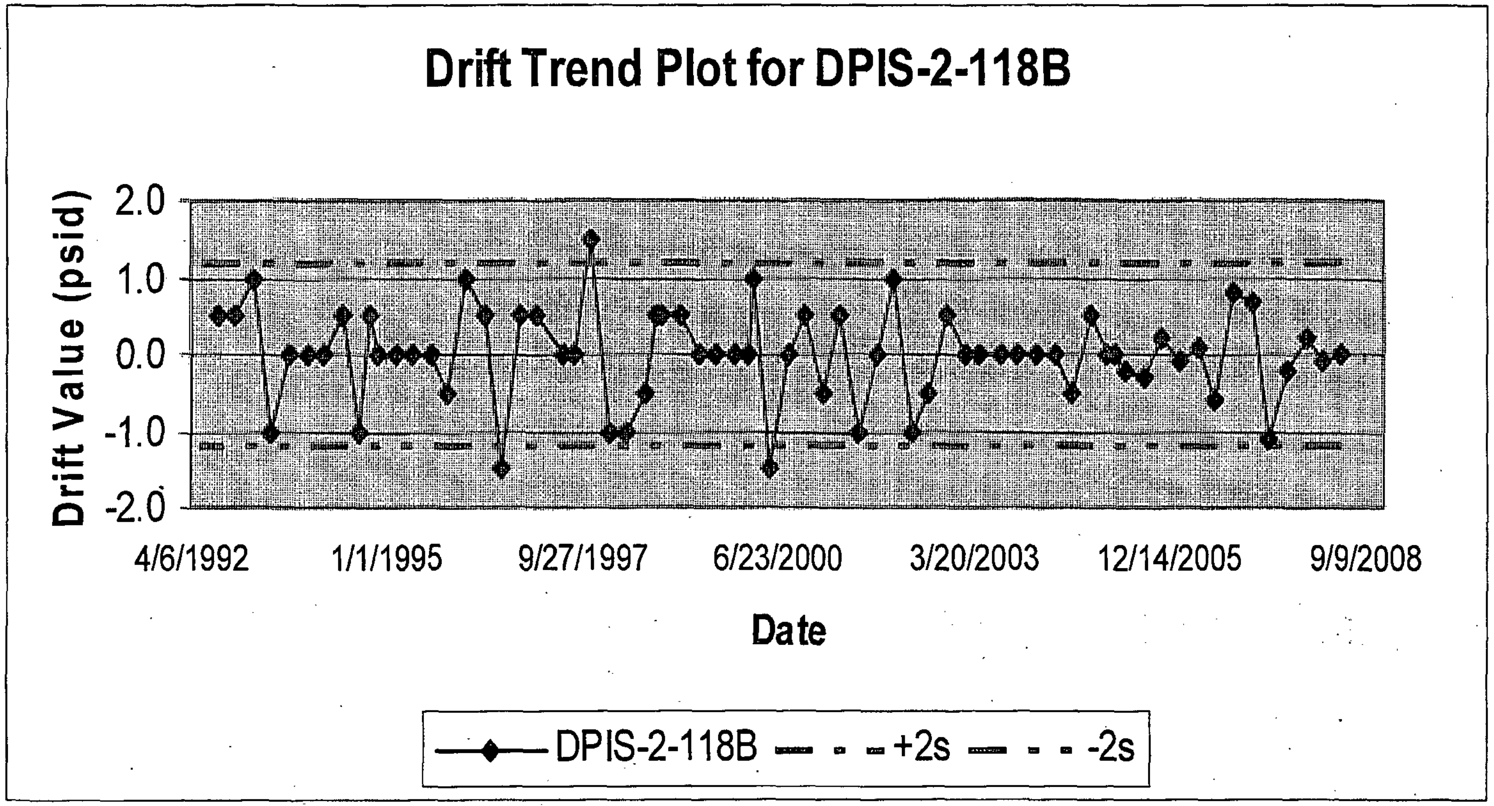
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.9	141.9	0.0	0.00
2/5/2008	2.7	141.9	141.9	-0.1	-0.05
11/15/2007	3.3	142.0	142.0	0.2	0.10
8/6/2007	3.0	141.8	141.8	-0.2	-0.10
5/7/2007	2.9	142.0	142.0	-1.1	-0.55
2/8/2007	3.1	143.1	143.1	0.7	0.35
11/6/2006	3.0	142.4	142.4	0.8	0.40
8/7/2006	3.0	141.6	141.6	-0.6	-0.30
5/8/2006	3.0	142.2	142.2	0.1	0.05
2/6/2006	3.2	142.1	142.1	-0.1	-0.05
10/31/2005	3.0	142.2	142.2	0.2	0.10
8/1/2005	3.0	142.0	142.0	-0.3	-0.15
5/2/2005	1.7	142.3	142.3	-0.2	-0.10
3/12/2005	1.3	142.5	142.5	0.0	0.00
1/31/2005	3.0	142.5	142.5	0.0	0.00
11/1/2004	3.0	142.5	142.5	0.5	0.25
8/2/2004	3.0	142.0	142.0	-0.5	-0.25
5/3/2004	3.0	142.5	142.5	0.0	0.00
2/2/2004	3.0	142.5	142.5	0.0	0.00
11/3/2003	3.0	142.5	142.5	0.0	0.00
8/4/2003	3.4	142.5	142.5	0.0	0.00
4/23/2003	2.6	144.0	142.5	0.0	0.00
2/3/2003	3.0	144.0	144.0	0.0	0.00
11/4/2002	3.0	144.0	144.0	0.5	0.25
8/5/2002	3.0	143.5	143.5	-0.5	-0.25
5/6/2002	3.0	144.0	144.0	-1.0	-0.50
2/4/2002	3.0	145.0	145.0	1.0	0.50
11/6/2001	2.9	144.0	144.0	0.0	0.00
8/10/2001	3.1	144.0	144.0	-1.0	-0.50
5/7/2001	3.0	145.0	145.0	0.5	0.25
2/5/2001	3.0	144.5	144.5	-0.5	-0.25
11/6/2000	3.0	145.0	145.0	0.5	0.25
8/7/2000	3.0	144.5	144.5	0.0	0.00
5/9/2000	2.9	144.5	144.5	-1.5	-0.75
2/11/2000	0.7	146.0	146.0	1.0	0.50
1/21/2000	2.4	145.0	145.0	0.0	0.00
11/8/1999	3.0	145.0	145.0	0.0	0.00
8/9/1999	3.0	145.0	145.0	0.0	0.00
5/10/1999	3.0	145.0	145.0	0.0	0.00
2/8/1999	3.0	145.0	145.0	0.5	0.25
11/9/1998	1.3	144.5	144.5	0.5	0.25
9/30/1998	1.7	125.0	144.0	0.5	0.25
8/10/1998	3.0	124.5	124.5	-0.5	-0.25

5/12/1998	2.9	125.0	125.0	-1.0	-0.50
2/12/1998	3.0	126.0	126.0	-1.0	-0.50
11/11/1997	3.0	127.0	127.0	1.5	0.75
8/11/1997	1.4	125.5	125.5	0.0	0.00
6/30/1997	4.6	125.5	125.5	0.0	0.00
2/10/1997	3.0	125.5	125.5	0.5	0.25
11/11/1996	3.0	125.0	125.0	0.5	0.25
8/13/1996	2.7	124.5	124.5	-1.5	-0.75
5/24/1996	3.3	126.0	126.0	0.5	0.25
2/13/1996	3.0	125.5	125.5	1.0	0.50
11/13/1995	3.0	124.5	124.5	-0.5	-0.25
8/15/1995	3.0	125.0	125.0	0.0	0.00
5/15/1995	3.0	125.0	125.0	0.0	0.00
2/13/1995	3.0	125.0	125.0	0.0	0.00
11/15/1994	1.5	125.0	125.0	0.0	0.00
9/29/1994	1.5	125.0	125.0	0.5	0.25
8/15/1994	3.0	124.5	124.5	-1.0	-0.50
5/17/1994	3.0	125.5	125.5	0.5	0.25
2/15/1994	3.0	125.0	125.0	0.0	0.00
11/16/1993	3.0	125.0	125.0	0.0	0.00
8/17/1993	3.0	125.0	125.0	0.0	0.00
5/18/1993	2.9	125.0	125.0	-1.0	-0.50
2/19/1993	3.0	126.0	126.0	1.0	0.50
11/19/1992	3.0	125.0	125.0	0.5	0.25
8/18/1992	3.0	124.5	124.5	0.5	0.25
5/18/1992		124.0	124.0		

Basic Statistics for DPIS-2-118B

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.60
Variance	s^2	(psid)	0.37
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.00
Standard Deviation	s	(%)	0.30
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-118B
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-118B
+2s
-2s

Drift Data for DPIS-2-118C

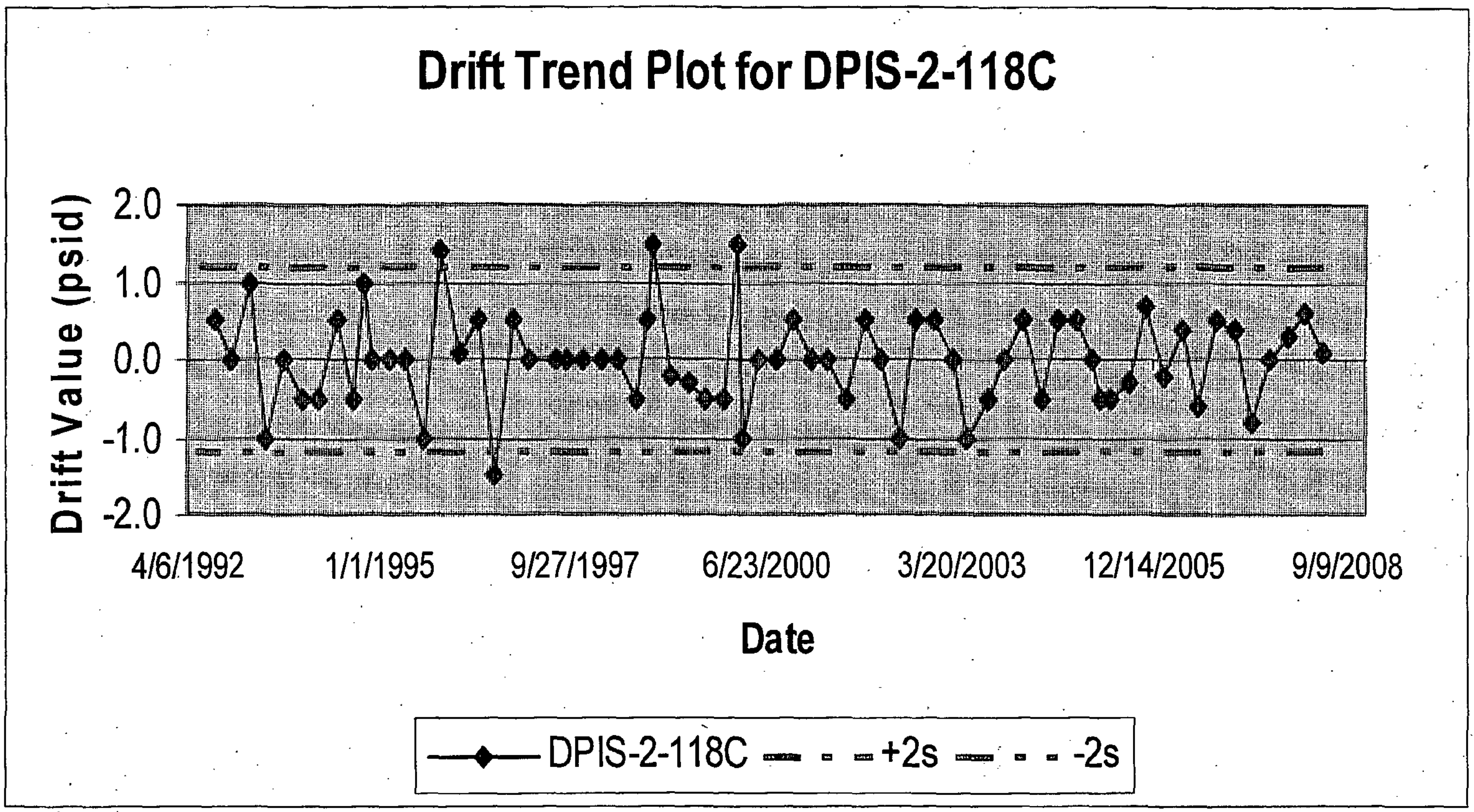
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	142.6	142.6	0.1	0.05
2/5/2008	2.7	142.5	142.5	0.6	0.30
11/15/2007	3.3	141.9	141.9	0.3	0.15
8/6/2007	3.0	141.6	141.6	0.0	0.00
5/7/2007	2.9	141.6	141.6	-0.8	-0.40
2/8/2007	3.1	142.4	142.4	0.4	0.20
11/6/2006	3.0	142.0	142.0	0.5	0.25
8/7/2006	3.0	141.5	141.5	-0.6	-0.30
5/8/2006	3.0	142.1	142.1	0.4	0.20
2/6/2006	3.2	141.7	141.7	-0.2	-0.10
10/31/2005	3.0	141.9	141.9	0.7	0.35
8/1/2005	3.0	141.2	141.2	-0.3	-0.15
5/2/2005	1.7	141.5	141.5	-0.5	-0.25
3/11/2005	1.3	142.0	142.0	-0.5	-0.25
1/31/2005	3.0	142.5	142.5	0.0	0.00
11/1/2004	3.0	142.5	142.5	0.5	0.25
8/2/2004	3.0	142.0	142.0	0.5	0.25
5/3/2004	3.0	141.5	141.5	-0.5	-0.25
2/2/2004	3.0	142.0	142.0	0.5	0.25
11/3/2003	3.0	141.5	141.5	0.0	0.00
8/4/2003	3.4	141.5	141.5	-0.5	-0.25
4/23/2003	2.6	144.0	142.0	-1.0	-0.50
2/3/2003	3.0	145.0	145.0	0.0	0.00
11/4/2002	3.0	145.0	145.0	0.5	0.25
8/5/2002	3.0	144.5	144.5	0.5	0.25
5/6/2002	3.0	144.0	144.0	-1.0	-0.50
2/4/2002	3.0	145.0	145.0	0.0	0.00
11/6/2001	2.9	145.0	145.0	0.5	0.25
8/10/2001	3.1	144.5	144.5	-0.5	-0.25
5/7/2001	3.0	145.0	145.0	0.0	0.00
2/5/2001	3.0	145.0	145.0	0.0	0.00
11/6/2000	3.0	145.0	145.0	0.5	0.25
8/7/2000	3.0	144.5	144.5	0.0	0.00
5/9/2000	2.9	144.5	144.5	0.0	0.00
2/11/2000	0.7	144.5	144.5	-1.0	-0.50
1/21/2000	2.4	145.5	145.5	1.5	0.75
11/8/1999	3.0	144.0	144.0	-0.5	-0.25
8/9/1999	3.0	144.5	144.5	-0.5	-0.25
5/10/1999	3.0	145.0	145.0	-0.3	-0.15
2/8/1999	3.0	145.3	145.3	-0.2	-0.10
11/9/1998	1.3	145.5	145.5	1.5	0.75
9/30/1998	1.7	126.0	144.0	0.5	0.25
8/10/1998	3.0	125.5	125.5	-0.5	-0.25

5/12/1998	2.9	126.0	126.0	0.0	0.00
2/12/1998	3.0	126.0	126.0	0.0	0.00
11/11/1997	3.0	126.0	126.0	0.0	0.00
8/11/1997	1.4	126.0	126.0	0.0	0.00
6/30/1997	4.6	126.0	126.0	0.0	0.00
2/10/1997	3.0	126.0	126.0	0.0	0.00
11/11/1996	3.0	126.0	126.0	0.5	0.25
8/13/1996	2.7	125.5	125.5	-1.5	-0.75
5/24/1996	3.3	127.0	127.0	0.5	0.25
2/13/1996	3.0	126.5	126.5	0.1	0.05
11/13/1995	3.0	126.4	126.4	1.4	0.70
8/15/1995	3.0	125.0	125.0	-1.0	-0.50
5/15/1995	3.0	126.0	126.0	0.0	0.00
2/13/1995	3.0	126.0	126.0	0.0	0.00
11/15/1994	1.6	126.0	126.0	0.0	0.00
9/28/1994	1.4	126.0	126.0	1.0	0.50
8/15/1994	3.0	125.0	125.0	-0.5	-0.25
5/17/1994	3.0	125.5	125.5	0.5	0.25
2/15/1994	3.0	125.0	125.0	-0.5	-0.25
11/16/1993	3.0	125.5	125.5	-0.5	-0.25
8/17/1993	3.0	126.0	126.0	0.0	0.00
5/18/1993	2.9	126.0	126.0	-1.0	-0.50
2/19/1993	3.0	127.0	127.0	1.0	0.50
11/19/1992	3.0	126.0	126.0	0.0	0.00
8/18/1992	3.0	126.0	126.0	0.5	0.25
5/18/1992		125.5	125.5		

Basic Statistics for DPIS-2-118C

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.60
Variance	s^2	(psid)	0.36
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-1.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	0.01
Standard Deviation	s	(%)	0.30
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-0.75


Drift Trend Plot for DPIS-2-118C
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-118C
+2s
-2s

Drift Data for DPIS-2-118D

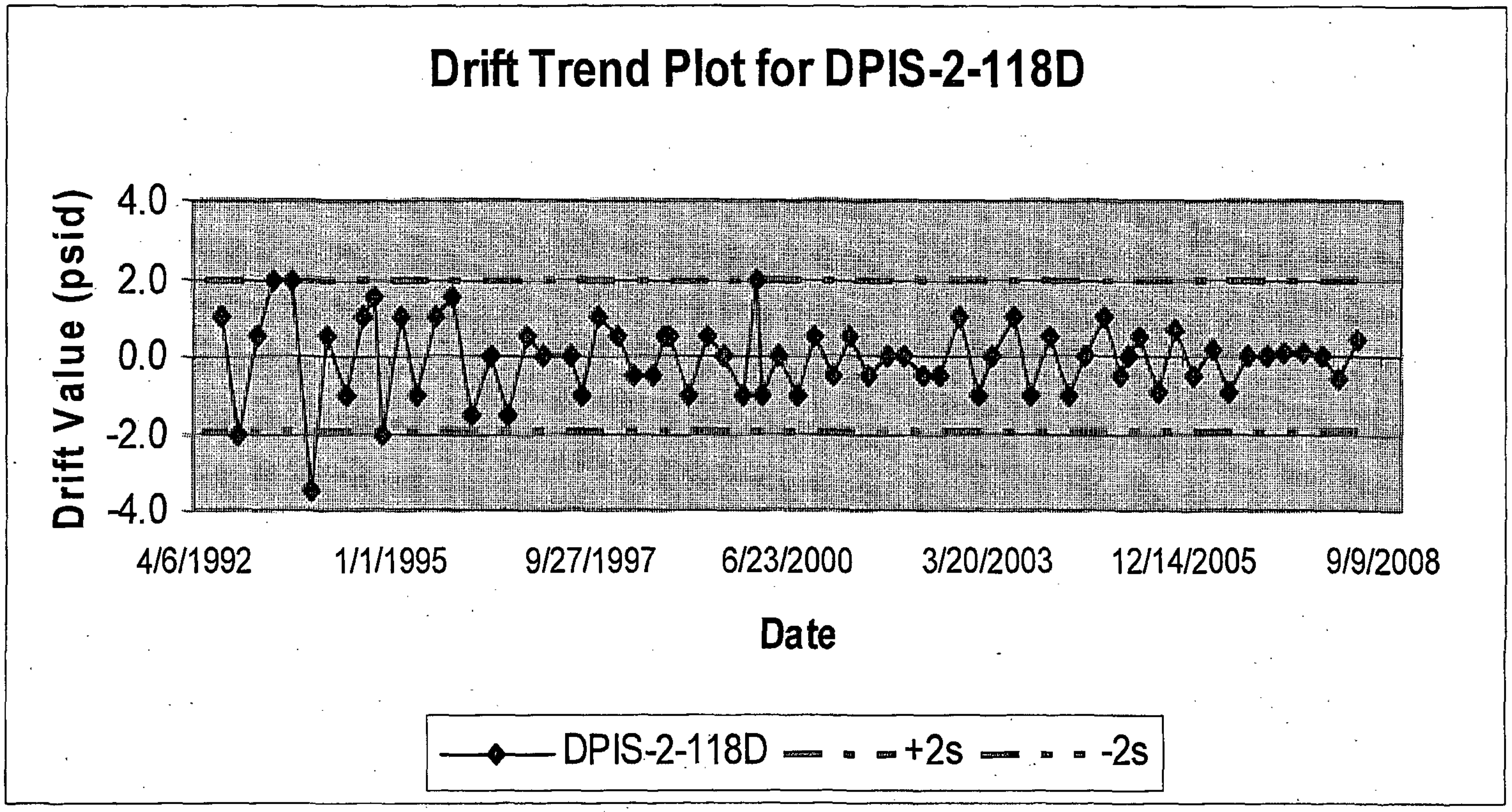
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.8	141.8	0.4	0.20
2/5/2008	2.7	141.4	141.4	-0.6	-0.30
11/15/2007	3.3	142.0	142.0	0.0	0.00
8/6/2007	2.9	142.0	142.0	0.1	0.05
5/9/2007	3.0	141.9	141.9	0.1	0.05
2/8/2007	3.1	141.8	141.8	0.0	0.00
11/6/2006	3.0	141.8	141.8	0.0	0.00
8/7/2006	3.0	138.1	141.8	-0.9	-0.45
5/8/2006	3.0	139.0	139.0	0.2	0.10
2/6/2006	3.2	138.8	138.8	-0.5	-0.25
10/31/2005	3.0	139.3	139.3	0.7	0.35
8/1/2005	3.0	138.6	138.6	-0.9	-0.45
5/2/2005	1.6	139.5	139.5	0.5	0.25
3/13/2005	1.3	139.0	139.0	0.0	0.00
1/31/2005	3.0	139.0	139.0	-0.5	-0.25
11/1/2004	3.0	139.5	139.5	1.0	0.50
8/2/2004	3.0	138.5	138.5	0.0	0.00
5/3/2004	3.0	138.5	138.5	-1.0	-0.50
2/2/2004	3.0	139.5	139.5	0.5	0.25
11/3/2003	3.0	139.0	139.0	-1.0	-0.50
8/4/2003	3.4	140.0	140.0	1.0	0.50
4/23/2003	2.6	139.0	139.0	0.0	0.00
2/3/2003	3.0	139.0	139.0	-1.0	-0.50
11/4/2002	3.0	140.0	140.0	1.0	0.50
8/5/2002	3.0	139.0	139.0	-0.5	-0.25
5/6/2002	3.0	139.5	139.5	-0.5	-0.25
2/4/2002	3.0	140.0	140.0	0.0	0.00
11/6/2001	2.9	140.0	140.0	0.0	0.00
8/10/2001	3.1	140.0	140.0	-0.5	-0.25
5/7/2001	3.0	140.5	140.5	0.5	0.25
2/5/2001	3.0	140.0	140.0	-0.5	-0.25
11/6/2000	3.0	140.5	140.5	0.5	0.25
8/7/2000	3.0	140.0	140.0	-1.0	-0.50
5/9/2000	2.9	141.0	141.0	0.0	0.00
2/11/2000	0.7	141.0	141.0	-1.0	-0.50
1/22/2000	2.5	142.0	142.0	2.0	1.00
11/8/1999	3.0	140.0	140.0	-1.0	-0.50
8/9/1999	3.0	141.0	141.0	0.0	0.00
5/10/1999	3.0	141.0	141.0	0.5	0.25
2/8/1999	3.0	140.5	140.5	-1.0	-0.50
11/9/1998	1.3	141.5	141.5	0.5	0.25
9/30/1998	1.7	124.0	141.0	0.5	0.25
8/10/1998	3.0	123.5	123.5	-0.5	-0.25

5/12/1998	2.9	124.0	124.0	-0.5	-0.25
2/12/1998	3.0	124.5	124.5	0.5	0.25
11/11/1997	3.0	124.0	124.0	1.0	0.50
8/11/1997	1.4	123.0	123.0	-1.0	-0.50
6/30/1997	4.6	124.0	124.0	0.0	0.00
2/10/1997	3.0	124.0	124.0	0.0	0.00
11/11/1996	3.0	124.0	124.0	0.5	0.25
8/13/1996	2.7	123.5	123.5	-1.5	-0.75
5/24/1996	3.3	125.0	125.0	0.0	0.00
2/13/1996	3.0	125.0	125.0	-1.5	-0.75
11/13/1995	3.0	126.5	126.5	1.5	0.75
8/15/1995	3.0	125.0	125.0	1.0	0.50
5/15/1995	3.0	124.0	124.0	-1.0	-0.50
2/13/1995	3.0	125.0	125.0	1.0	0.50
11/15/1994	1.5	124.0	124.0	-2.0	-1.00
9/29/1994	1.5	125.5	126.0	1.5	0.75
8/15/1994	3.0	124.0	124.0	1.0	0.50
5/17/1994	3.0	123.0	123.0	-1.0	-0.50
2/15/1994	3.0	124.0	124.0	0.5	0.25
11/16/1993	3.0	123.5	123.5	-3.5	-1.75
8/17/1993	3.0	127.0	127.0	2.0	1.00
5/18/1993	2.9	125.0	125.0	2.0	1.00
2/19/1993	3.0	123.0	123.0	0.5	0.25
11/19/1992	3.0	122.5	122.5	-2.0	-1.00
8/18/1992	3.0	124.5	124.5	1.0	0.50
5/18/1992		123.5	123.5		

Basic Statistics for DPIS-2-118D

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	1.00
Variance	s^2	(psid)	0.99
Largest Positive Drift		(psid)	2.0
Largest Negative Drift		(psid)	-3.5
Number of Samples	n		68

Average	$\bar{x}$	(%)	-0.02
Standard Deviation	s	(%)	0.50
Largest Positive Drift		(%)	1.00
Largest Negative Drift		(%)	-1.75


Drift Trend Plot for DPIS-2-118D
Drift Value (psid)
4.0
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-118D
+2s
-2s

Drift Data for DPIS-2-119A

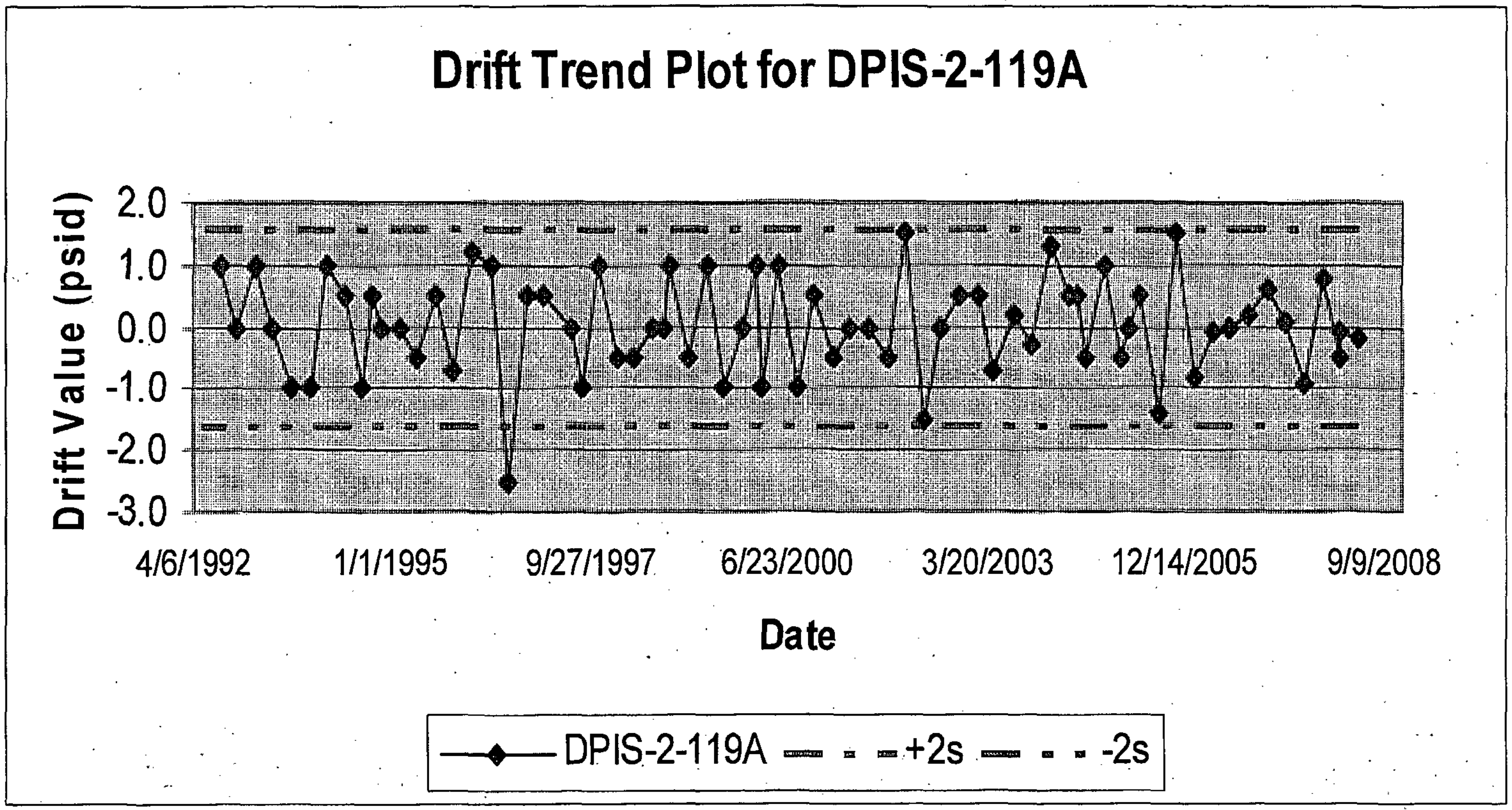
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.2	141.2	-0.2	-0.10
2/5/2008	0.0	141.4	141.4	-0.1	-0.05
2/4/2008	2.7	141.5	141.5	-0.5	-0.25
11/15/2007	3.3	142.0	142.0	0.8	0.40
8/6/2007	3.0	141.2	141.2	-0.9	-0.45
5/7/2007	2.9	142.1	142.1	0.1	0.05
2/8/2007	3.1	142.0	142.0	0.6	0.30
11/6/2006	3.0	141.4	141.4	0.2	0.10
8/7/2006	3.0	141.2	141.2	0.0	0.00
5/8/2006	3.0	141.2	141.2	-0.1	-0.05
2/6/2006	3.2	141.3	141.3	-0.8	-0.40
10/31/2005	3.0	142.1	142.1	1.5	0.75
8/1/2005	3.0	140.6	140.6	-1.4	-0.70
5/2/2005	1.7	142.0	142.0	0.5	0.25
3/11/2005	1.3	141.5	141.5	0.0	0.00
1/31/2005	3.0	141.5	141.5	-0.5	-0.25
11/1/2004	3.0	142.0	142.0	1.0	0.50
8/2/2004	1.4	141.0	141.0	-0.5	-0.25
6/20/2004	1.6	144.0	141.5	0.5	0.25
5/3/2004	3.0	144.0	143.5	0.5	0.25
2/2/2004	3.0	144.5	143.5	1.3	0.65
11/3/2003	3.0	143.2	143.2	-0.3	-0.15
8/4/2003	3.4	143.5	143.5	0.2	0.10
4/23/2003	2.6	143.3	143.3	-0.7	-0.35
2/3/2003	3.0	144.0	144.0	0.5	0.25
11/4/2002	3.0	143.5	143.5	0.5	0.25
8/5/2002	3.0	143.0	143.0	0.0	0.00
5/6/2002	3.0	143.0	143.0	-1.5	-0.75
2/4/2002	3.0	144.5	144.5	1.5	0.75
11/6/2001	2.9	143.0	143.0	-0.5	-0.25
8/10/2001	3.1	143.5	143.5	0.0	0.00
5/7/2001	3.0	143.5	143.5	0.0	0.00
2/5/2001	3.0	143.5	143.5	-0.5	-0.25
11/6/2000	3.0	144.0	144.0	0.5	0.25
8/7/2000	3.0	143.5	143.5	-1.0	-0.50
5/9/2000	2.9	144.5	144.5	1.0	0.50
2/11/2000	0.7	143.5	143.5	-1.0	-0.50
1/20/2000	2.4	144.5	144.5	1.0	0.50
11/8/1999	3.0	143.5	143.5	0.0	0.00
8/9/1999	3.0	143.5	143.5	-1.0	-0.50
5/10/1999	3.0	144.5	144.5	1.0	0.50
2/8/1999	3.0	143.5	143.5	-0.5	-0.25
11/9/1998	1.3	144.0	144.0	1.0	0.50

9/30/1998	1.7	122.0	143.0	0.0	0.00
8/10/1998	3.0	122.0	122.0	0.0	0.00
5/12/1998	2.9	122.0	122.0	-0.5	-0.25
2/12/1998	3.0	122.5	122.5	-0.5	-0.25
11/11/1997	3.0	123.0	123.0	1.0	0.50
8/11/1997	1.4	122.0	122.0	-1.0	-0.50
6/30/1997	4.6	123.0	123.0	0.0	0.00
2/10/1997	3.0	123.0	123.0	0.5	0.25
11/11/1996	3.0	122.5	122.5	0.5	0.25
8/13/1996	2.7	122.0	122.0	-2.5	-1.25
5/24/1996	3.3	124.5	124.5	1.0	0.50
2/13/1996	3.0	123.5	123.5	1.2	0.60
11/13/1995	3.0	122.3	122.3	-0.7	-0.35
8/15/1995	3.0	123.0	123.0	0.5	0.25
5/15/1995	3.0	122.5	122.5	-0.5	-0.25
2/13/1995	3.0	123.0	123.0	0.0	0.00
11/15/1994	1.6	123.0	123.0	0.0	0.00
9/27/1994	1.4	123.0	123.0	0.5	0.25
8/15/1994	3.0	122.5	122.5	-1.0	-0.50
5/17/1994	3.0	123.5	123.5	0.5	0.25
2/15/1994	3.0	123.0	123.0	1.0	0.50
11/16/1993	3.0	122.0	122.0	-1.0	-0.50
8/17/1993	3.0	123.0	123.0	-1.0	-0.50
5/18/1993	2.9	124.0	124.0	0.0	0.00
2/19/1993	3.0	124.0	124.0	1.0	0.50
11/19/1992	3.0	123.0	123.0	0.0	0.00
8/18/1992	3.0	123.0	123.0	1.0	0.50
5/18/1992		122.0	122.0		

Basic Statistics for DPIS-2-119A

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.80
Variance	s^2	(psid)	0.63
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-2.5
Number of Samples	n		70

Average	$\bar{x}$	(%)	0.02
Standard Deviation	s	(%)	0.40
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-1.25



Drift Trend Plot for DPIS-2-119A
Drift Value (psid)
2.0
1.0
0.0
-1.0
-2.0
-3.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-119A
+2s
-2s

Drift Data for DPIS-2-119B

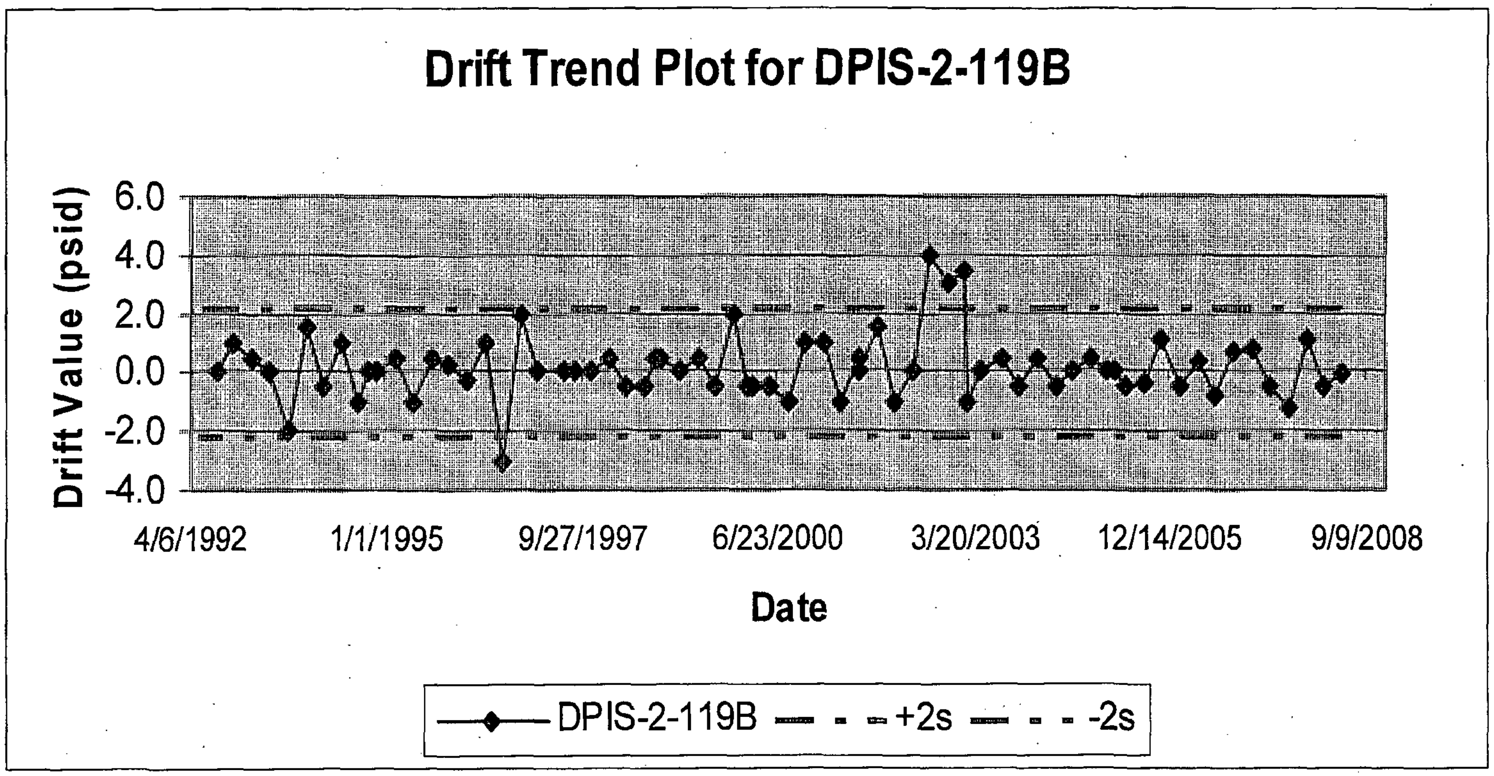
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	141.6	141.6	-0.1	-0.05
2/5/2008	2.7	141.7	141.7	-0.5	-0.25
11/15/2007	3.3	142.2	142.2	1.1	0.55
8/6/2007	3.0	141.1	141.1	-1.2	-0.60
5/7/2007	2.9	142.3	142.3	-0.5	-0.25
2/8/2007	3.1	142.8	142.8	0.8	0.40
11/6/2006	3.0	142.0	142.0	0.7	0.35
8/7/2006	3.0	141.3	141.3	-0.8	-0.40
5/8/2006	3.0	142.1	142.1	0.4	0.20
2/6/2006	3.2	141.7	141.7	-0.5	-0.25
10/31/2005	3.0	142.2	142.2	1.1	0.55
8/1/2005	3.0	141.1	141.1	-0.4	-0.20
5/2/2005	1.6	141.5	141.5	-0.5	-0.25
3/13/2005	1.3	142.0	142.0	0.0	0.00
1/31/2005	3.0	142.0	142.0	0.0	0.00
11/1/2004	3.0	142.0	142.0	0.5	0.25
8/2/2004	3.0	141.5	141.5	0.0	0.00
5/3/2004	3.0	141.5	141.5	-0.5	-0.25
2/2/2004	3.0	142.0	142.0	0.5	0.25
11/3/2003	3.0	141.5	141.5	-0.5	-0.25
8/4/2003	3.4	142.0	142.0	0.5	0.25
4/23/2003	2.6	141.5	141.5	0.0	0.00
2/3/2003	0.3	141.5	141.5	-1.0	-0.50
1/24/2003	2.7	146.0	142.5	3.5	1.75
11/4/2002	3.0	148.0	142.5	3.0	1.50
8/5/2002	3.0	149.0	145.0	4.0	2.00
5/6/2002	3.0	145.0	145.0	0.0	0.00
2/4/2002	3.0	145.0	145.0	-1.0	-0.50
11/6/2001	2.9	146.0	146.0	1.5	0.75
8/10/2001	0.0	144.5	144.5	0.0	0.00
8/10/2001	3.1	144.5	144.5	0.5	0.25
5/7/2001	3.0	144.0	144.0	-1.0	-0.50
2/5/2001	3.0	145.0	145.0	1.0	0.50
11/6/2000	3.0	144.0	144.0	1.0	0.50
8/7/2000	3.0	143.0	143.0	-1.0	-0.50
5/9/2000	2.9	144.0	144.0	-0.5	-0.25
2/11/2000	0.7	144.5	144.5	-0.5	-0.25
1/21/2000	2.4	145.0	145.0	-0.5	-0.25
11/8/1999	3.0	145.5	145.5	2.0	1.00
8/9/1999	3.0	143.5	143.5	-0.5	-0.25
5/10/1999	3.0	144.0	144.0	0.5	0.25
2/8/1999	3.0	143.5	143.5	0.0	0.00
11/9/1998	1.3	143.5	143.5	0.5	0.25

9/30/1998	1.7	126.0	143.0	0.5	0.25
8/10/1998	3.0	125.5	125.5	-0.5	-0.25
5/12/1998	2.9	126.0	126.0	-0.5	-0.25
2/12/1998	3.0	126.5	126.5	0.5	0.25
11/11/1997	3.0	126.0	126.0	0.0	0.00
8/11/1997	1.4	126.0	126.0	0.0	0.00
6/30/1997	4.6	126.0	126.0	0.0	0.00
2/10/1997	3.0	126.0	126.0	0.0	0.00
11/11/1996	3.0	126.0	126.0	2.0	1.00
8/13/1996	2.7	124.0	124.0	-3.0	-1.50
5/24/1996	3.3	127.0	127.0	1.0	0.50
2/13/1996	3.0	126.0	126.0	-0.3	-0.15
11/13/1995	3.0	126.3	126.3	0.3	0.15
8/15/1995	3.0	126.0	126.0	0.5	0.25
5/15/1995	3.0	125.5	125.5	-1.0	-0.50
2/13/1995	3.0	126.5	126.5	0.5	0.25
11/15/1994	1.5	126.0	126.0	0.0	0.00
9/29/1994	1.5	126.0	126.0	0.0	0.00
8/15/1994	3.0	126.0	126.0	-1.0	-0.50
5/17/1994	3.0	127.0	127.0	1.0	0.50
2/15/1994	3.0	126.0	126.0	-0.5	-0.25
11/16/1993	3.0	126.5	126.5	1.5	0.75
8/17/1993	3.0	125.0	125.0	-2.0	-1.00
5/18/1993	2.9	127.0	127.0	0.0	0.00
2/19/1993	3.0	127.0	127.0	0.5	0.25
11/19/1992	3.0	126.5	126.5	1.0	0.50
8/18/1992	3.0	125.5	125.5	0.0	0.00
5/18/1992		125.5	125.5		

Basic Statistics for DPIS-2-119B

Average	$\bar{x}$	(psid)	0.2
Standard Deviation	s	(psid)	1.10
Variance	s^2	(psid)	1.21
Largest Positive Drift		(psid)	4.0
Largest Negative Drift		(psid)	-3.0
Number of Samples	n		70

Average	$\bar{x}$	(%)	0.09
Standard Deviation	s	(%)	0.55
Largest Positive Drift		(%)	2.00
Largest Negative Drift		(%)	-1.50


Drift Trend Plot for DPIS-2-119B
Drift Value (psid)
6.0
4.0
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-119B
+2s
-2s

Drift Data for DPIS-2-119C

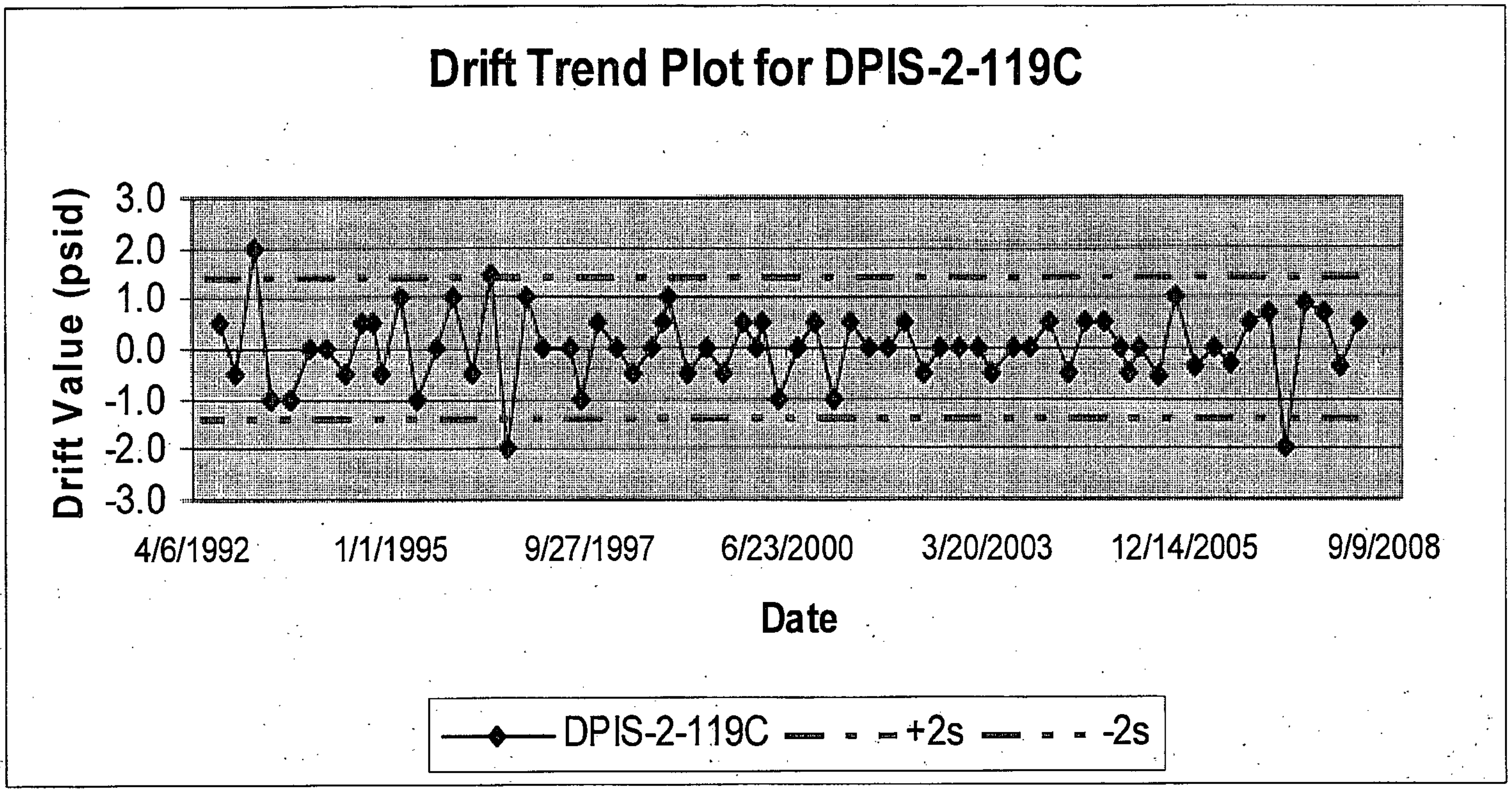
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	140.6	140.6	0.5	0.25
2/5/2008	2.7	140.1	140.1	-0.4	-0.20
11/15/2007	3.3	140.5	140.5	0.7	0.35
8/6/2007	3.0	139.8	139.8	0.9	0.45
5/7/2007	2.9	138.9	138.9	-2.0	-1.00
2/8/2007	3.1	140.9	140.9	0.7	0.35
11/6/2006	3.0	140.2	140.2	0.5	0.25
8/7/2006	3.0	139.7	139.7	-0.3	-0.15
5/8/2006	3.0	140.0	140.0	0.0	0.00
2/6/2006	3.2	140.0	140.0	-0.4	-0.20
10/31/2005	3.0	140.4	140.4	1.0	0.50
8/1/2005	3.0	139.4	139.4	-0.6	-0.30
5/2/2005	1.7	140.0	140.0	0.0	0.00
3/12/2005	1.3	140.0	140.0	-0.5	-0.25
1/31/2005	3.0	140.5	140.5	0.0	0.00
11/1/2004	3.0	140.5	140.5	0.5	0.25
8/2/2004	3.0	140.0	140.0	0.5	0.25
5/3/2004	3.0	139.5	139.5	-0.5	-0.25
2/2/2004	3.0	144.0	140.0	0.5	0.25
11/3/2003	3.0	143.5	143.5	0.0	0.00
8/4/2003	3.4	143.5	143.5	0.0	0.00
4/23/2003	2.6	143.5	143.5	-0.5	-0.25
2/3/2003	3.0	144.0	144.0	0.0	0.00
11/4/2002	3.0	144.0	144.0	0.0	0.00
8/5/2002	3.0	144.0	144.0	0.0	0.00
5/6/2002	3.0	144.0	144.0	-0.5	-0.25
2/4/2002	3.0	144.5	144.5	0.5	0.25
11/6/2001	2.9	144.0	144.0	0.0	0.00
8/10/2001	3.1	144.0	144.0	0.0	0.00
5/7/2001	3.0	144.0	144.0	0.5	0.25
2/5/2001	3.0	143.5	143.5	-1.0	-0.50
11/6/2000	3.0	144.5	144.5	0.5	0.25
8/7/2000	3.0	144.0	144.0	0.0	0.00
5/9/2000	2.9	144.0	144.0	-1.0	-0.50
2/11/2000	0.7	145.0	145.0	0.5	0.25
1/21/2000	2.4	144.5	144.5	0.0	0.00
11/8/1999	3.0	144.5	144.5	0.5	0.25
8/9/1999	3.0	144.0	144.0	-0.5	-0.25
5/10/1999	3.0	144.5	144.5	0.0	0.00
2/8/1999	3.0	144.5	144.5	-0.5	-0.25
11/9/1998	1.3	145.0	145.0	1.0	0.50
9/30/1998	1.7	124.5	144.0	0.5	0.25
8/10/1998	3.0	124.0	124.0	0.0	0.00
5/12/1998	2.9	124.0	124.0	-0.5	-0.25

2/12/1998	3.0	124.5	124.5	0.0	0.00
11/11/1997	3.0	124.5	124.5	0.5	0.25
8/11/1997	1.4	124.0	124.0	-1.0	-0.50
6/30/1997	4.6	125.0	125.0	0.0	0.00
2/10/1997	3.0	125.0	125.0	0.0	0.00
11/11/1996	3.0	125.0	125.0	1.0	0.50
8/13/1996	2.7	124.0	124.0	-2.0	-1.00
5/24/1996	3.3	126.0	126.0	1.5	0.75
2/13/1996	3.0	124.5	124.5	-0.5	-0.25
11/13/1995	3.0	125.0	125.0	1.0	0.50
8/15/1995	3.0	124.0	124.0	0.0	0.00
5/15/1995	3.0	124.0	124.0	-1.0	-0.50
2/13/1995	3.0	125.0	125.0	1.0	0.50
11/15/1994	1.6	124.0	124.0	-0.5	-0.25
9/28/1994	1.4	125.5	124.5	0.5	0.25
8/15/1994	3.0	125.0	125.0	0.5	0.25
5/17/1994	3.0	124.5	124.5	-0.5	-0.25
2/15/1994	3.0	125.0	125.0	0.0	0.00
11/16/1993	3.0	125.0	125.0	0.0	0.00
8/17/1993	3.0	125.0	125.0	-1.0	-0.50
5/18/1993	2.9	126.0	126.0	-1.0	-0.50
2/19/1993	3.0	127.0	127.0	2.0	1.00
11/19/1992	3.0	125.0	125.0	-0.5	-0.25
8/18/1992	3.0	125.5	125.5	0.5	0.25
5/18/1992		125.0	125.0		

Basic Statistics for DPIS-2-119C

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	S	(psid)	0.72
Variance	s^2	(psid)	0.51
Largest Positive Drift		(psid)	2.0
Largest Negative Drift		(psid)	-2.0
Number of Samples	N		68

Average	$\bar{x}$	(%)	0.01
Standard Deviation	s	(%)	0.36
Largest Positive Drift		(%)	1.00
Largest Negative Drift		(%)	-1.00


Drift Trend Plot for DPIS-2-119C
Drift Value (psid)
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-119C
+2s
-2s

Drift Data for DPIS-2-119D

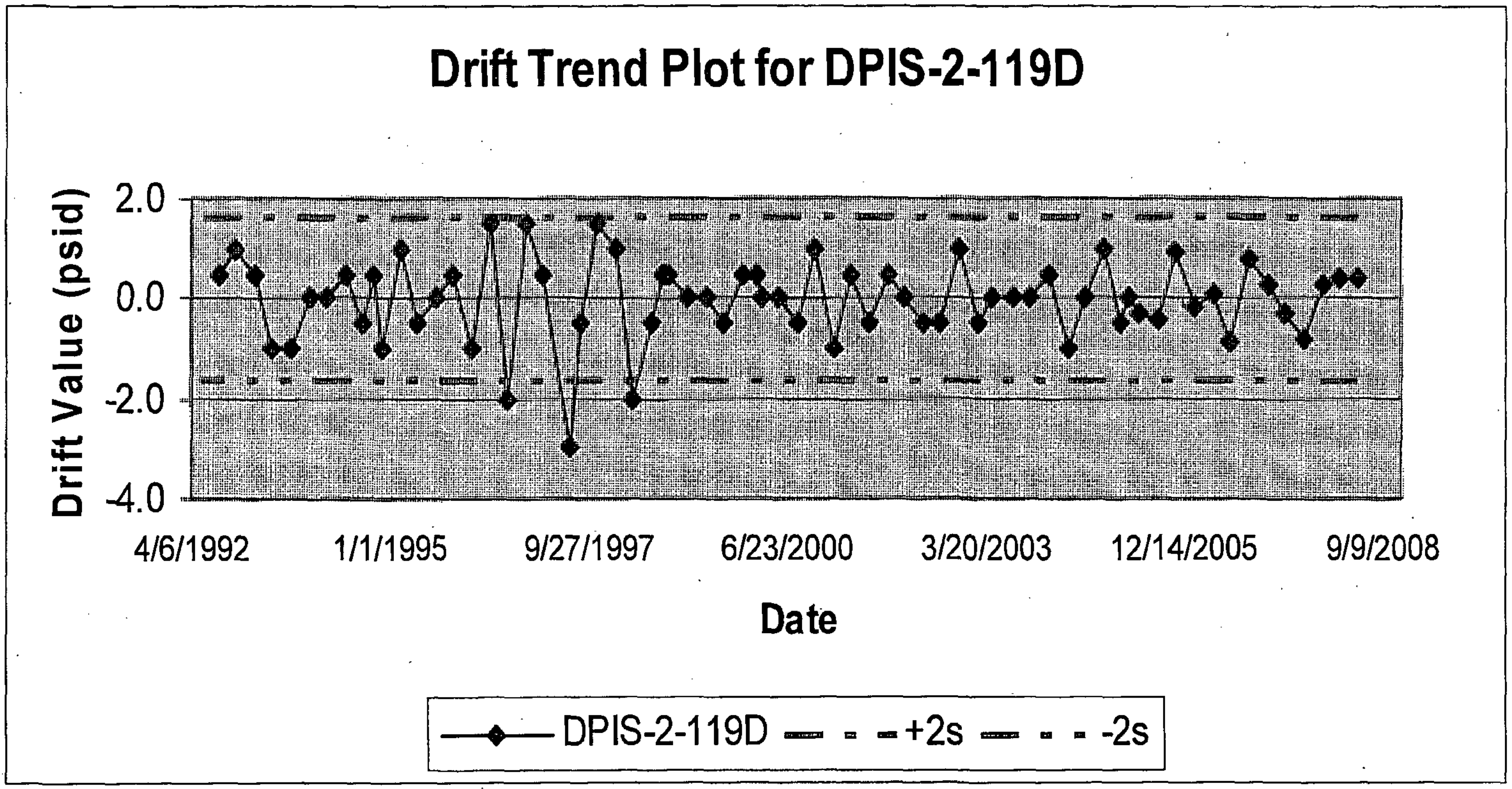
Date	Calibration Interval (Months)	As-Found	As-Left	Drift (psid)	Drift (%)
5/5/2008	3.0	142.8	142.8	0.4	0.20
2/5/2008	2.7	142.4	142.4	0.4	0.20
11/15/2007	3.3	142.0	142.0	0.3	0.15
8/6/2007	2.9	141.7	141.7	-0.8	-0.40
5/9/2007	3.0	142.5	142.5	-0.3	-0.15
2/8/2007	3.1	142.8	142.8	0.3	0.15
11/6/2006	3.0	142.5	142.5	0.8	0.40
8/7/2006	3.0	141.7	141.7	-0.9	-0.45
5/8/2006	3.0	142.6	142.6	0.1	0.05
2/6/2006	3.2	142.5	142.5	-0.2	-0.10
10/31/2005	3.0	142.7	142.7	0.9	0.45
8/1/2005	3.0	141.8	141.8	-0.4	-0.20
5/2/2005	1.6	142.2	142.2	-0.3	-0.15
3/13/2005	1.3	142.5	142.5	0.0	0.00
1/31/2005	3.0	142.5	142.5	-0.5	-0.25
11/1/2004	3.0	143.0	143.0	1.0	0.50
8/2/2004	3.0	142.0	142.0	0.0	0.00
5/3/2004	3.0	142.0	142.0	-1.0	-0.50
2/2/2004	3.0	143.0	143.0	0.5	0.25
11/3/2003	3.0	142.5	142.5	0.0	0.00
8/4/2003	3.4	142.5	142.5	0.0	0.00
4/23/2003	2.6	142.5	142.5	0.0	0.00
2/3/2003	3.0	142.5	142.5	-0.5	-0.25
11/4/2002	3.0	143.0	143.0	1.0	0.50
8/5/2002	3.0	142.0	142.0	-0.5	-0.25
5/6/2002	3.0	142.5	142.5	-0.5	-0.25
2/4/2002	3.0	143.0	143.0	0.0	0.00
11/6/2001	2.9	143.0	143.0	0.5	0.25
8/10/2001	3.1	142.5	142.5	-0.5	-0.25
5/7/2001	3.0	143.0	143.0	0.5	0.25
2/5/2001	3.0	142.5	142.5	-1.0	-0.50
11/6/2000	3.0	143.5	143.5	1.0	0.50
8/7/2000	3.0	142.5	142.5	-0.5	-0.25
5/9/2000	2.9	143.0	143.0	0.0	0.00
2/11/2000	0.7	143.0	143.0	0.0	0.00
1/22/2000	2.5	144.0	143.0	0.5	0.25
11/8/1999	3.0	143.5	143.5	0.5	0.25
8/9/1999	3.0	143.0	143.0	-0.5	-0.25
5/10/1999	3.0	143.5	143.5	0.0	0.00
2/8/1999	3.0	143.5	143.5	0.0	0.00
11/9/1998	1.3	143.5	143.5	0.5	0.25
9/30/1998	1.7	122.0	143.0	0.5	0.25
8/10/1998	3.0	121.5	121.5	-0.5	-0.25
5/12/1998	2.9	122.0	122.0	-2.0	-1.00

2/12/1998	3.0	124.0	124.0	1.0	0.50
11/11/1997	3.0	123.0	123.0	1.5	0.75
8/11/1997	1.4	121.5	121.5	-0.5	-0.25
6/30/1997	4.6	122.0	122.0	-3.0	-1.50
2/10/1997	3.0	125.0	125.0	0.5	0.25
11/11/1996	3.0	124.5	124.5	1.5	0.75
8/13/1996	2.7	123.0	123.0	-2.0	-1.00
5/24/1996	3.3	125.0	125.0	1.5	0.75
2/13/1996	3.0	123.5	123.5	-1.0	-0.50
11/13/1995	3.0	124.5	124.5	0.5	0.25
8/15/1995	3.0	124.0	124.0	0.0	0.00
5/15/1995	3.0	124.0	124.0	-0.5	-0.25
2/13/1995	3.0	124.5	124.5	1.0	0.50
11/15/1994	1.5	123.5	123.5	-1.0	-0.50
9/29/1994	1.5	124.5	124.5	0.5	0.25
8/15/1994	3.0	124.0	124.0	-0.5	-0.25
5/17/1994	3.0	124.5	124.5	0.5	0.25
2/15/1994	3.0	124.0	124.0	0.0	0.00
11/16/1993	3.0	124.0	124.0	0.0	0.00
8/17/1993	3.0	124.0	124.0	-1.0	-0.50
5/18/1993	2.9	125.0	125.0	-1.0	-0.50
2/19/1993	3.0	126.0	126.0	0.5	0.25
11/19/1992	3.0	125.5	125.5	1.0	0.50
8/18/1992	3.0	124.5	124.5	0.5	0.25
5/18/1992		124.0	124.0		

Basic Statistics for DPIS-2-119D

Average	$\bar{x}$	(psid)	0.0
Standard Deviation	s	(psid)	0.82
Variance	s^2	(psid)	0.68
Largest Positive Drift		(psid)	1.5
Largest Negative Drift		(psid)	-3.0
Number of Samples	n		68

Average	$\bar{x}$	(%)	-0.01
Standard Deviation	s	(%)	0.41
Largest Positive Drift		(%)	0.75
Largest Negative Drift		(%)	-1.50


Drift Trend Plot for DPIS-2-119D
Drift Value (psid)
2.0
0.0
-2.0
-4.0
4/6/1992
1/1/1995
9/27/1997
6/23/2000
3/20/2003
12/14/2005
9/9/2008
Date
DPIS-2-119D
+2s
-2s

Basic Statistics for Combined Data

Average	mean	(psid)	0.0
Standard Deviation	s	(psid)	0.88
Variance	s^2	(psid)	0.78
Largest Positive Drift		(psid)	4.5
Largest Negative Drift		(psid)	-4.5
Number of Samples	n		1094
Average	mean	(%)	0.00
Standard Deviation	s	(%)	0.44
Largest Positive Drift		(%)	2.25
Largest Negative Drift		(%)	-2.25

Outlier Test (t-Test) for Combined Data Set

Equipment ID	Calibration Interval (Months)	Drift (psid)	T	Outlier? YES/NO
DPIS-2-116A	3.0	0.1	0.10	NO
	2.7	-0.2	0.24	NO
	3.3	1.0	1.12	NO
	3.0	-0.8	0.92	NO
	2.9	-1.2	1.37	NO
	3.1	1.0	1.12	NO
	3.0	0.7	0.78	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.2	-0.5	0.58	NO
	3.0	0.3	0.33	NO
	3.0	0.0	0.01	NO
	1.7	0.0	0.01	NO
	1.2	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	1.4	-0.5	0.58	NO
	1.6	3.5	3.95	NO
	3.0	-3.0	3.41	NO
	3.0	0.5	0.56	NO
	3.0	-1.5	1.71	NO
	3.4	0.5	0.56	NO
	2.6	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	2.9	0.5	0.56	NO
	3.1	-0.5	0.58	NO
	3.0	1.5	1.69	NO
	3.0	-0.5	0.58	NO
	3.0	-2.0	2.27	NO
	3.0	1.5	1.69	NO
	2.9	-1.0	1.14	NO
	0.7	0.5	0.56	NO
	2.4	-1.5	1.71	NO
	3.0	0.0	0.01	NO
	3.0	4.0	4.52	YES
	3.0	-3.0	3.41	NO
	3.0	-1.0	1.14	NO

	1.3	1.5	1.69	NO
	1.7	-4.0	4.54	YES
	3.0	0.0	0.01	NO
	2.9	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	3.5	3.95	NO
	1.4	-4.5	5.11	YES
	4.6	4.0	4.52	YES
	3.0	-4.0	4.54	YES
	3.0	0.0	0.01	NO
	2.7	-2.0	2.27	NO
	3.3	3.0	3.39	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	1.6	-1.0	1.14	NO
	1.4	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	1.5	1.69	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	2.9	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
DPIS-2-116B	3.0	-0.1	0.12	NO
	2.7	-0.5	0.58	NO
	3.3	1.1	1.24	NO
	3.0	-0.6	0.69	NO
	2.9	-0.9	1.03	NO
	3.1	1.1	1.24	NO
	3.0	0.5	0.56	NO
	3.0	-0.4	0.46	NO
	3.0	0.0	0.01	NO
	3.2	-0.4	0.46	NO
	3.0	1.1	1.24	NO
	3.0	-1.0	1.14	NO
	1.7	0.5	0.56	NO
	1.3	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO

	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.4	-0.5	0.58	NO
	2.6	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	2.9	0.0	0.01	NO
	3.1	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	2.9	-0.5	0.58	NO
	0.7	0.5	0.56	NO
	2.4	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	1.3	1.0	1.12	NO
	1.7	0.3	0.33	NO
	3.0	0.2	0.22	NO
	2.9	-1.5	1.71	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	1.4	1.0	1.12	NO
	4.6	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.7	-1.0	1.14	NO
	3.3	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	1.5	1.69	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	1.5	0.5	0.56	NO
	1.5	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO

	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
DPIS-2-116C	3.0	-0.2	0.24	NO
	2.7	0.4	0.44	NO
	3.3	-0.2	0.24	NO
	3.0	-0.8	0.92	NO
	2.9	0.8	0.90	NO
	3.1	0.8	0.90	NO
	3.0	0.0	0.01	NO
	3.0	-1.1	1.26	NO
	3.0	0.0	0.01	NO
	3.2	1.0	1.12	NO
	3.0	0.4	0.44	NO
	3.0	-0.6	0.69	NO
	1.7	0.0	0.01	NO
	1.3	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.4	0.0	0.01	NO
	2.6	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	2.9	0.5	0.56	NO
	3.1	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	0.0	0.01	NO
	0.7	-0.2	0.24	NO
	2.4	1.2	1.35	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	0.0	0.01	NO

	3.0	0.0	0.01	NO
	1.3	1.0	1.12	NO
	1.7	0.0	0.01	NO
	3.0	0.0	0.01	NO
	2.9	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	1.4	-1.0	1.14	NO
	4.6	0.0	0.01	NO
	3.0	0.2	0.22	NO
	3.0	0.8	0.90	NO
	2.7	-1.5	1.71	NO
	3.3	1.5	1.69	NO
	3.0	-0.8	0.92	NO
	3.0	0.8	0.90	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	1.6	-0.5	0.58	NO
	1.4	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	2.9	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
DPIS-2-116D	3.0	-0.9	1.03	NO
	2.7	-0.3	0.35	NO
	3.3	1.0	1.12	NO
	3.0	-0.2	0.24	NO
	2.9	-1.4	1.60	NO
	3.1	1.3	1.46	NO
	3.0	0.3	0.33	NO
	3.0	-0.6	0.69	NO
	3.0	-0.1	0.12	NO
	3.2	-0.6	0.69	NO
	3.0	1.1	1.24	NO
	3.0	-0.1	0.12	NO
	1.6	0.0	0.01	NO
	1.3	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO

	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.4	0.5	0.56	NO
	2.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	2.9	1.5	1.69	NO
	3.1	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	0.5	0.56	NO
	0.7	-1.5	1.71	NO
	2.5	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	1.3	0.5	0.56	NO
	1.7	0.2	0.22	NO
	3.0	-0.2	0.24	NO
	2.9	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	1.4	-1.0	1.14	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	2.7	-2.0	2.27	NO
	3.3	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.5	0.5	0.56	NO
	1.5	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO

	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	-2.0	2.27	NO
	2.9	1.0	1.12	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
DPIS-2-117A	3.0	-0.5	0.58	NO
	2.7	-0.3	0.35	NO
	3.3	0.6	0.67	NO
	3.0	0.0	0.01	NO
	2.9	-0.5	0.58	NO
	3.1	0.2	0.22	NO
	3.0	0.2	0.22	NO
	3.0	-0.4	0.46	NO
	3.0	0.1	0.10	NO
	3.2	-0.9	1.03	NO
	3.0	0.9	1.01	NO
	3.0	0.5	0.56	NO
	1.7	-0.1	0.12	NO
	1.3	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.4	-0.5	0.58	NO
	2.6	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	1.0	1.12	NO
	3.1	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	2.9	0.2	0.22	NO
	0.7	-1.2	1.37	NO
	2.4	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO

	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	1.3	0.5	0.56	NO
	1.7	-0.4	0.46	NO
	3.0	0.4	0.44	NO
	2.9	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	1.4	-0.5	0.58	NO
	4.6	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	2.7	-1.5	1.71	NO
	3.3	1.0	1.12	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	1.6	0.5	0.56	NO
	1.4	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	2.9	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
DPIS-2-117B	3.0	-2.0	2.27	NO
	2.7	-0.3	0.35	NO
	3.3	0.8	0.90	NO
	3.0	-0.4	0.46	NO
	2.9	-1.2	1.37	NO
	3.1	3.2	3.61	NO
	3.0	0.5	0.56	NO
	3.0	0.1	0.10	NO
	3.0	-1.2	1.37	NO
	3.2	-0.2	0.24	NO
	3.0	1.7	1.91	NO
	3.0	-0.1	0.12	NO
	1.7	1.0	1.12	NO
	1.3	-1.5	1.71	NO
	3.0	0.0	0.01	NO

	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.4	0.5	0.56	NO
	2.6	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	2.9	0.5	0.56	NO
	3.1	-1.0	1.14	NO
	1.2	1.5	1.69	NO
	1.8	-1.5	1.71	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	2.9	1.0	1.12	NO
	0.7	-0.5	0.58	NO
	2.4	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.5	1.71	NO
	3.0	1.5	1.69	NO
	1.3	0.5	0.56	NO
	1.7	4.5	5.09	YES
	3.0	-0.5	0.58	NO
	2.9	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	1.4	0.5	0.56	NO
	4.6	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	2.7	0.0	0.01	NO
	3.3	1.0	1.12	NO
	3.0	-0.3	0.35	NO
	3.0	-0.2	0.24	NO
	3.0	1.5	1.69	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	1.5	0.5	0.56	NO
	1.5	0.0	0.01	NO

	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
DPIS-2-117C	3.0	-0.6	0.69	NO
	2.7	0.1	0.10	NO
	3.3	0.5	0.56	NO
	3.0	-0.6	0.69	NO
	2.9	-0.6	0.69	NO
	3.1	0.8	0.90	NO
	3.0	0.4	0.44	NO
	3.0	-0.4	0.46	NO
	3.0	-0.2	0.24	NO
	3.2	-0.1	0.12	NO
	3.0	0.8	0.90	NO
	3.0	-0.3	0.35	NO
	1.7	0.0	0.01	NO
	1.3	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.4	0.44	NO
	3.0	-0.4	0.46	NO
	3.4	-0.5	0.58	NO
	2.6	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	2.9	0.5	0.56	NO
	3.1	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	0.0	0.01	NO
	0.7	-0.5	0.58	NO
	2.4	0.5	0.56	NO

	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	2.0	2.25	NO
	3.0	-2.0	2.27	NO
	1.3	1.0	1.12	NO
	1.7	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	2.9	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	1.4	-0.5	0.58	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	1.5	1.69	NO
	2.7	-2.5	2.84	NO
	3.3	0.5	0.56	NO
	3.0	0.3	0.33	NO
	3.0	2.2	2.48	NO
	3.0	-1.5	1.71	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.6	-0.5	0.58	NO
	1.4	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	2.9	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
DPIS-2-117D	3.0	-0.2	0.24	NO
	2.7	-0.6	0.69	NO
	3.3	1.4	1.57	NO
	2.9	-1.0	1.14	NO
	3.0	-1.1	1.26	NO
	3.1	0.3	0.33	NO
	3.0	2.4	2.71	NO
	3.0	-1.1	1.26	NO
	3.0	0.2	0.22	NO
	3.2	-0.7	0.80	NO
	3.0	1.7	1.91	NO
	3.0	-0.7	0.80	NO
	1.6	-1.5	1.71	NO

	1.3	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	2.0	2.25	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.4	-1.0	1.14	NO
	2.6	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	1.5	1.69	NO
	3.0	-1.0	1.14	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	2.9	1.5	1.69	NO
	3.1	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	2.9	-0.5	0.58	NO
	0.7	-1.0	1.14	NO
	2.5	2.0	2.25	NO
	3.0	-1.5	1.71	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-1.5	1.71	NO
	1.3	0.0	0.01	NO
	1.7	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	2.9	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.4	-1.5	1.71	NO
	4.6	0.0	0.01	NO
	3.0	0.2	0.22	NO
	3.0	1.3	1.46	NO
	2.7	-2.0	2.27	NO
	3.3	1.5	1.69	NO
	3.0	-1.6	1.82	NO
	3.0	1.6	1.80	NO
	3.0	-0.5	0.58	NO
	3.0	-1.5	1.71	NO
	3.0	1.0	1.12	NO
	1.5	0.5	0.56	NO

	1.5	0.5	0.56	NO
	3.0	-1.5	1.71	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.5	1.71	NO
	2.9	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	1.0	1.12	NO
DPIS-2-118A	3.0	-0.3	0.35	NO
	2.7	-0.5	0.58	NO
	3.3	1.1	1.24	NO
	3.0	-0.3	0.35	NO
	2.9	-1.3	1.48	NO
	3.1	1.2	1.35	NO
	3.0	0.2	0.22	NO
	3.0	-0.1	0.12	NO
	3.0	-0.1	0.12	NO
	3.2	-0.4	0.46	NO
	3.0	1.5	1.69	NO
	3.0	-0.8	0.92	NO
	1.7	0.1	0.10	NO
	1.3	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	0.9	1.01	NO
	3.0	0.1	0.10	NO
	3.4	0.0	0.01	NO
	2.6	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	2.9	0.0	0.01	NO
	3.1	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	1.0	1.12	NO
	0.7	-1.5	1.71	NO

	2.4	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	1.3	1.0	1.12	NO
	1.7	0.0	0.01	NO
	3.0	0.0	0.01	NO
	2.9	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	1.4	-0.5	0.58	NO
	4.6	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	2.7	-1.5	1.71	NO
	3.3	1.5	1.69	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	1.6	0.0	0.01	NO
	1.4	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
DPIS-2-118B	3.0	0.0	0.01	NO
	2.7	-0.1	0.12	NO
	3.3	0.2	0.22	NO
	3.0	-0.2	0.24	NO
	2.9	-1.1	1.26	NO
	3.1	0.7	0.78	NO
	3.0	0.8	0.90	NO
	3.0	-0.6	0.69	NO
	3.0	0.1	0.10	NO
	3.2	-0.1	0.12	NO
	3.0	0.2	0.22	NO
	3.0	-0.3	0.35	NO

	1.7	-0.2	0.24	NO
	1.3	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.4	0.0	0.01	NO
	2.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	2.9	0.0	0.01	NO
	3.1	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	-1.5	1.71	NO
	0.7	1.0	1.12	NO
	2.4	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	1.3	0.5	0.56	NO
	1.7	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	-1.0	1.14	NO
	3.0	-1.0	1.14	NO
	3.0	1.5	1.69	NO
	1.4	0.0	0.01	NO
	4.6	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	2.7	-1.5	1.71	NO
	3.3	0.5	0.56	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO

	1.5	0.0	0.01	NO
	1.5	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	2.9	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
DPIS-2-118C	3.0	0.1	0.10	NO
	2.7	0.6	0.67	NO
	3.3	0.3	0.33	NO
	3.0	0.0	0.01	NO
	2.9	-0.8	0.92	NO
	3.1	0.4	0.44	NO
	3.0	0.5	0.56	NO
	3.0	-0.6	0.69	NO
	3.0	0.4	0.44	NO
	3.2	-0.2	0.24	NO
	3.0	0.7	0.78	NO
	3.0	-0.3	0.35	NO
	1.7	-0.5	0.58	NO
	1.3	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.4	-0.5	0.58	NO
	2.6	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	2.9	0.5	0.56	NO
	3.1	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	0.0	0.01	NO

	0.7	-1.0	1.14	NO
	2.4	1.5	1.69	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	-0.3	0.35	NO
	3.0	-0.2	0.24	NO
	1.3	1.5	1.69	NO
	1.7	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	1.4	0.0	0.01	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	2.7	-1.5	1.71	NO
	3.3	0.5	0.56	NO
	3.0	0.1	0.10	NO
	3.0	1.4	1.57	NO
	3.0	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	1.6	0.0	0.01	NO
	1.4	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
DPIS-2-118D	3.0	0.4	0.44	NO
	2.7	-0.6	0.69	NO
	3.3	0.0	0.01	NO
	2.9	0.1	0.10	NO
	3.0	0.1	0.10	NO
	3.1	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-0.9	1.03	NO
	3.0	0.2	0.22	NO
	3.2	-0.5	0.58	NO
	3.0	0.7	0.78	NO

	3.0	-0.9	1.03	NO
	1.6	0.5	0.56	NO
	1.3	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.4	1.0	1.12	NO
	2.6	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	0.0	0.01	NO
	3.1	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	2.9	0.0	0.01	NO
	0.7	-1.0	1.14	NO
	2.5	2.0	2.25	NO
	3.0	-1.0	1.14	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	1.3	0.5	0.56	NO
	1.7	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	1.0	1.12	NO
	1.4	-1.0	1.14	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	2.7	-1.5	1.71	NO
	3.3	0.0	0.01	NO
	3.0	-1.5	1.71	NO
	3.0	1.5	1.69	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO

	3.0	1.0	1.12	NO
	1.5	-2.0	2.27	NO
	1.5	1.5	1.69	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	-3.5	3.97	NO
	3.0	2.0	2.25	NO
	2.9	2.0	2.25	NO
	3.0	0.5	0.56	NO
	3.0	-2.0	2.27	NO
	3.0	1.0	1.12	NO
DPIS-2-119A	3.0	-0.2	0.24	NO
	0.0	-0.1	0.12	NO
	2.7	-0.5	0.58	NO
	3.3	0.8	0.90	NO
	3.0	-0.9	1.03	NO
	2.9	0.1	0.10	NO
	3.1	0.6	0.67	NO
	3.0	0.2	0.22	NO
	3.0	0.0	0.01	NO
	3.0	-0.1	0.12	NO
	3.2	-0.8	0.92	NO
	3.0	1.5	1.69	NO
	3.0	-1.4	1.60	NO
	1.7	0.5	0.56	NO
	1.3	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.4	-0.5	0.58	NO
	1.6	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	1.3	1.46	NO
	3.0	-0.3	0.35	NO
	3.4	0.2	0.22	NO
	2.6	-0.7	0.80	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-1.5	1.71	NO
	3.0	1.5	1.69	NO
	2.9	-0.5	0.58	NO
	3.1	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO

	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	2.9	1.0	1.12	NO
	0.7	-1.0	1.14	NO
	2.4	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	1.3	1.0	1.12	NO
	1.7	0.0	0.01	NO
	3.0	0.0	0.01	NO
	2.9	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.4	-1.0	1.14	NO
	4.6	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	2.7	-2.5	2.84	NO
	3.3	1.0	1.12	NO
	3.0	1.2	1.35	NO
	3.0	-0.7	0.80	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	1.6	0.0	0.01	NO
	1.4	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	3.0	-1.0	1.14	NO
	2.9	0.0	0.01	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
DPIS-2-119B	3.0	-0.1	0.12	NO
	2.7	-0.5	0.58	NO
	3.3	1.1	1.24	NO
	3.0	-1.2	1.37	NO
	2.9	-0.5	0.58	NO
	3.1	0.8	0.90	NO
	3.0	0.7	0.78	NO
	3.0	-0.8	0.92	NO

	3.0	0.4	0.44	NO
	3.2	-0.5	0.58	NO
	3.0	1.1	1.24	NO
	3.0	-0.4	0.46	NO
	1.6	-0.5	0.58	NO
	1.3	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.4	0.5	0.56	NO
	2.6	0.0	0.01	NO
	0.3	-1.0	1.14	NO
	2.7	3.5	3.95	NO
	3.0	3.0	3.39	NO
	3.0	4.0	4.52	YES
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	2.9	1.5	1.69	NO
	0.0	0.0	0.01	NO
	3.1	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	1.0	1.12	NO
	3.0	-1.0	1.14	NO
	2.9	-0.5	0.58	NO
	0.7	-0.5	0.58	NO
	2.4	-0.5	0.58	NO
	3.0	2.0	2.25	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	1.3	0.5	0.56	NO
	1.7	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	1.4	0.0	0.01	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	2.0	2.25	NO
	2.7	-3.0	3.41	NO

	3.3	1.0	1.12	NO
	3.0	-0.3	0.35	NO
	3.0	0.3	0.33	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	1.5	0.0	0.01	NO
	1.5	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	1.5	1.69	NO
	3.0	-2.0	2.27	NO
	2.9	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
DPIS-2-119C	3.0	0.5	0.56	NO
	2.7	-0.4	0.46	NO
	3.3	0.7	0.78	NO
	3.0	0.9	1.01	NO
	2.9	-2.0	2.27	NO
	3.1	0.7	0.78	NO
	3.0	0.5	0.56	NO
	3.0	-0.3	0.35	NO
	3.0	0.0	0.01	NO
	3.2	-0.4	0.46	NO
	3.0	1.0	1.12	NO
	3.0	-0.6	0.69	NO
	1.7	0.0	0.01	NO
	1.3	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.4	0.0	0.01	NO
	2.6	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	2.9	0.0	0.01	NO

	3.1	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	-1.0	1.14	NO
	0.7	0.5	0.56	NO
	2.4	0.0	0.01	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	1.3	1.0	1.12	NO
	1.7	0.5	0.56	NO
	3.0	0.0	0.01	NO
	2.9	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.5	0.56	NO
	1.4	-1.0	1.14	NO
	4.6	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	1.0	1.12	NO
	2.7	-2.0	2.27	NO
	3.3	1.5	1.69	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	1.6	-0.5	0.58	NO
	1.4	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	2.9	-1.0	1.14	NO
	3.0	2.0	2.25	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
DPIS-2-119D	3.0	0.4	0.44	NO
	2.7	0.4	0.44	NO
	3.3	0.3	0.33	NO
	2.9	-0.8	0.92	NO
	3.0	-0.3	0.35	NO
	3.1	0.3	0.33	NO

	3.0	0.8	0.90	NO
	3.0	-0.9	1.03	NO
	3.0	0.1	0.10	NO
	3.2	-0.2	0.24	NO
	3.0	0.9	1.01	NO
	3.0	-0.4	0.46	NO
	1.6	-0.3	0.35	NO
	1.3	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.4	0.0	0.01	NO
	2.6	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	2.9	0.5	0.56	NO
	3.1	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	-1.0	1.14	NO
	3.0	1.0	1.12	NO
	3.0	-0.5	0.58	NO
	2.9	0.0	0.01	NO
	0.7	0.0	0.01	NO
	2.5	0.5	0.56	NO
	3.0	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	1.3	0.5	0.56	NO
	1.7	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	2.9	-2.0	2.27	NO
	3.0	1.0	1.12	NO
	3.0	1.5	1.69	NO
	1.4	-0.5	0.58	NO
	4.6	-3.0	3.41	NO
	3.0	0.5	0.56	NO
	3.0	1.5	1.69	NO
	2.7	-2.0	2.27	NO
	3.3	1.5	1.69	NO
	3.0	-1.0	1.14	NO

	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	-0.5	0.58	NO
	3.0	1.0	1.12	NO
	1.5	-1.0	1.14	NO
	1.5	0.5	0.56	NO
	3.0	-0.5	0.58	NO
	3.0	0.5	0.56	NO
	3.0	0.0	0.01	NO
	3.0	0.0	0.01	NO
	3.0	-1.0	1.14	NO
	2.9	-1.0	1.14	NO
	3.0	0.5	0.56	NO
	3.0	1.0	1.12	NO
	3.0	0.5	0.56	NO

Normality Test – D' Test

Data # (i)	Drift (psid)	Ti
1	-4.5	2459.3
2	-4.0	2182.0
3	-4.0	2178.0
4	-3.5	1902.3
5	-3.0	1627.5
6	-3.0	1624.5
7	-3.0	1621.5
8	-3.0	1618.5
9	-2.5	1346.3
10	-2.5	1343.8
11	-2.0	1073.0
12	-2.0	1071.0
13	-2.0	1069.0
14	-2.0	1067.0
15	-2.0	1065.0
16	-2.0	1063.0
17	-2.0	1061.0
18	-2.0	1059.0
19	-2.0	1057.0
20	-2.0	1055.0
21	-2.0	1053.0
22	-2.0	1051.0
23	-2.0	1049.0
24	-2.0	1047.0
25	-1.6	836.0
26	-1.5	782.3
27	-1.5	780.8
28	-1.5	779.3
29	-1.5	777.8
30	-1.5	776.3
31	-1.5	774.8
32	-1.5	773.3
33	-1.5	771.8
34	-1.5	770.3
35	-1.5	768.8
36	-1.5	767.3
37	-1.5	765.8
38	-1.5	764.3
39	-1.5	762.8
40	-1.5	761.3
41	-1.5	759.8
42	-1.5	758.3

43	-1.5	756.8
44	-1.5	755.3
45	-1.5	753.8
46	-1.5	752.3
47	-1.5	750.8
48	-1.5	749.3
49	-1.5	747.8
50	-1.5	746.3
51	-1.4	695.1
52	-1.4	693.7
53	-1.3	642.8
54	-1.2	592.2
55	-1.2	591.0
56	-1.2	589.8
57	-1.2	588.6
58	-1.2	587.4
59	-1.1	537.4
60	-1.1	536.2
61	-1.1	535.1
62	-1.1	534.0
63	-1.0	484.5
64	-1.0	483.5
65	-1.0	482.5
66	-1.0	481.5
67	-1.0	480.5
68	-1.0	479.5
69	-1.0	478.5
70	-1.0	477.5
71	-1.0	476.5
72	-1.0	475.5
73	-1.0	474.5
74	-1.0	473.5
75	-1.0	472.5
76	-1.0	471.5
77	-1.0	470.5
78	-1.0	469.5
79	-1.0	468.5
80	-1.0	467.5
81	-1.0	466.5
82	-1.0	465.5
83	-1.0	464.5
84	-1.0	463.5
85	-1.0	462.5
86	-1.0	461.5
87	-1.0	460.5
88	-1.0	459.5
89	-1.0	458.5

90	-1.0	457.5
91	-1.0	456.5
92	-1.0	455.5
93	-1.0	454.5
94	-1.0	453.5
95	-1.0	452.5
96	-1.0	451.5
97	-1.0	450.5
98	-1.0	449.5
99	-1.0	448.5
100	-1.0	447.5
101	-1.0	446.5
102	-1.0	445.5
103	-1.0	444.5
104	-1.0	443.5
105	-1.0	442.5
106	-1.0	441.5
107	-1.0	440.5
108	-1.0	439.5
109	-1.0	438.5
110	-1.0	437.5
111	-1.0	436.5
112	-1.0	435.5
113	-1.0	434.5
114	-1.0	433.5
115	-1.0	432.5
116	-1.0	431.5
117	-1.0	430.5
118	-1.0	429.5
119	-1.0	428.5
120	-1.0	427.5
121	-1.0	426.5
122	-1.0	425.5
123	-1.0	424.5
124	-1.0	423.5
125	-1.0	422.5
126	-1.0	421.5
127	-1.0	420.5
128	-1.0	419.5
129	-1.0	418.5
130	-1.0	417.5
131	-1.0	416.5
132	-1.0	415.5
133	-1.0	414.5
134	-1.0	413.5
135	-1.0	412.5
136	-1.0	411.5
137	-1.0	410.5

138	-1.0	409.5
139	-1.0	408.5
140	-1.0	407.5
141	-1.0	406.5
142	-1.0	405.5
143	-1.0	404.5
144	-1.0	403.5
145	-1.0	402.5
146	-1.0	401.5
147	-1.0	400.5
148	-1.0	399.5
149	-1.0	398.5
150	-1.0	397.5
151	-1.0	396.5
152	-1.0	395.5
153	-1.0	394.5
154	-1.0	393.5
155	-1.0	392.5
156	-1.0	391.5
157	-1.0	390.5
158	-1.0	389.5
159	-1.0	388.5
160	-1.0	387.5
161	-1.0	386.5
162	-1.0	385.5
163	-1.0	384.5
164	-1.0	383.5
165	-1.0	382.5
166	-1.0	381.5
167	-1.0	380.5
168	-1.0	379.5
169	-1.0	378.5
170	-0.9	339.8
171	-0.9	338.9
172	-0.9	338.0
173	-0.9	337.1
174	-0.9	336.2
175	-0.9	335.3
176	-0.9	334.4
177	-0.8	296.4
178	-0.8	295.6
179	-0.8	294.8
180	-0.8	294.0
181	-0.8	293.2
182	-0.8	292.4
183	-0.8	291.6
184	-0.8	290.8
185	-0.7	253.8

186	-0.7	253.0
187	-0.7	252.3
188	-0.7	251.6
189	-0.6	215.1
190	-0.6	214.5
191	-0.6	213.9
192	-0.6	213.3
193	-0.6	212.7
194	-0.6	212.1
195	-0.6	211.5
196	-0.6	210.9
197	-0.6	210.3
198	-0.6	209.7
199	-0.6	209.1
200	-0.6	208.5
201	-0.5	173.3
202	-0.5	172.8
203	-0.5	172.3
204	-0.5	171.8
205	-0.5	171.3
206	-0.5	170.8
207	-0.5	170.3
208	-0.5	169.8
209	-0.5	169.3
210	-0.5	168.8
211	-0.5	168.3
212	-0.5	167.8
213	-0.5	167.3
214	-0.5	166.8
215	-0.5	166.3
216	-0.5	165.8
217	-0.5	165.3
218	-0.5	164.8
219	-0.5	164.3
220	-0.5	163.8
221	-0.5	163.3
222	-0.5	162.8
223	-0.5	162.3
224	-0.5	161.8
225	-0.5	161.3
226	-0.5	160.8
227	-0.5	160.3
228	-0.5	159.8
229	-0.5	159.3
230	-0.5	158.8
231	-0.5	158.3
232	-0.5	157.8

233	-0.5	157.3
234	-0.5	156.8
235	-0.5	156.3
236	-0.5	155.8
237	-0.5	155.3
238	-0.5	154.8
239	-0.5	154.3
240	-0.5	153.8
241	-0.5	153.3
242	-0.5	152.8
243	-0.5	152.3
244	-0.5	151.8
245	-0.5	151.3
246	-0.5	150.8
247	-0.5	150.3
248	-0.5	149.8
249	-0.5	149.3
250	-0.5	148.8
251	-0.5	148.3
252	-0.5	147.8
253	-0.5	147.3
254	-0.5	146.8
255	-0.5	146.3
256	-0.5	145.8
257	-0.5	145.3
258	-0.5	144.8
259	-0.5	144.3
260	-0.5	143.8
261	-0.5	143.3
262	-0.5	142.8
263	-0.5	142.3
264	-0.5	141.8
265	-0.5	141.3
266	-0.5	140.8
267	-0.5	140.3
268	-0.5	139.8
269	-0.5	139.3
270	-0.5	138.8
271	-0.5	138.3
272	-0.5	137.8
273	-0.5	137.3
274	-0.5	136.8
275	-0.5	136.3
276	-0.5	135.8
277	-0.5	135.3
278	-0.5	134.8
279	-0.5	134.3

280	-0.5	133.8
281	-0.5	133.3
282	-0.5	132.8
283	-0.5	132.3
284	-0.5	131.8
285	-0.5	131.3
286	-0.5	130.8
287	-0.5	130.3
288	-0.5	129.8
289	-0.5	129.3
290	-0.5	128.8
291	-0.5	128.3
292	-0.5	127.8
293	-0.5	127.3
294	-0.5	126.8
295	-0.5	126.3
296	-0.5	125.8
297	-0.5	125.3
298	-0.5	124.8
299	-0.5	124.3
300	-0.5	123.8
301	-0.5	123.3
302	-0.5	122.8
303	-0.5	122.3
304	-0.5	121.8
305	-0.5	121.3
306	-0.5	120.8
307	-0.5	120.3
308	-0.5	119.8
309	-0.5	119.3
310	-0.5	118.8
311	-0.5	118.3
312	-0.5	117.8
313	-0.5	117.3
314	-0.5	116.8
315	-0.5	116.3
316	-0.5	115.8
317	-0.5	115.3
318	-0.5	114.8
319	-0.5	114.3
320	-0.5	113.8
321	-0.5	113.3
322	-0.5	112.8
323	-0.5	112.3
324	-0.5	111.8
325	-0.5	111.3
326	-0.5	110.8
327	-0.5	110.3

328	-0.5	109.8
329	-0.5	109.3
330	-0.5	108.8
331	-0.5	108.3
332	-0.5	107.8
333	-0.5	107.3
334	-0.5	106.8
335	-0.5	106.3
336	-0.5	105.8
337	-0.5	105.3
338	-0.5	104.8
339	-0.5	104.3
340	-0.5	103.8
341	-0.5	103.3
342	-0.5	102.8
343	-0.5	102.3
344	-0.5	101.8
345	-0.5	101.3
346	-0.5	100.8
347	-0.5	100.3
348	-0.5	99.8
349	-0.5	99.3
350	-0.5	98.8
351	-0.5	98.3
352	-0.5	97.8
353	-0.5	97.3
354	-0.5	96.8
355	-0.5	96.3
356	-0.5	95.8
357	-0.5	95.3
358	-0.5	94.8
359	-0.5	94.3
360	-0.5	93.8
361	-0.5	93.3
362	-0.5	92.8
363	-0.5	92.3
364	-0.5	91.8
365	-0.4	73.0
366	-0.4	72.6
367	-0.4	72.2
368	-0.4	71.8
369	-0.4	71.4
370	-0.4	71.0
371	-0.4	70.6
372	-0.4	70.2
373	-0.4	69.8
374	-0.4	69.4

375	-0.4	69.0
376	-0.4	68.6
377	-0.3	51.2
378	-0.3	50.9
379	-0.3	50.6
380	-0.3	50.3
381	-0.3	50.0
382	-0.3	49.7
383	-0.3	49.4
384	-0.3	49.1
385	-0.3	48.8
386	-0.3	48.4
387	-0.3	48.1
388	-0.3	47.8
389	-0.3	47.5
390	-0.3	47.2
391	-0.3	46.9
392	-0.2	31.1
393	-0.2	30.9
394	-0.2	30.7
395	-0.2	30.5
396	-0.2	30.3
397	-0.2	30.1
398	-0.2	29.9
399	-0.2	29.7
400	-0.2	29.5
401	-0.2	29.3
402	-0.2	29.1
403	-0.2	28.9
404	-0.2	28.7
405	-0.2	28.5
406	-0.2	28.3
407	-0.2	28.1
408	-0.1	14.0
409	-0.1	13.9
410	-0.1	13.7
411	-0.1	13.6
412	-0.1	13.5
413	-0.1	13.4
414	-0.1	13.3
415	-0.1	13.2
416	-0.1	13.1
417	-0.1	13.0
418	-0.1	12.9
419	-0.1	12.8
420	-0.1	12.7
421	0.0	0.0

422	0.0	0.0
423	0.0	0.0
424	0.0	0.0
425	0.0	0.0
426	0.0	0.0
427	0.0	0.0
428	0.0	0.0
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434	0.0	0.0
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436	0.0	0.0
437	0.0	0.0
438	0.0	0.0
439	0.0	0.0
440	0.0	0.0
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445	0.0	0.0
446	0.0	0.0
447	0.0	0.0
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450	0.0	0.0
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462	0.0	0.0
463	0.0	0.0
464	0.0	0.0
465	0.0	0.0
466	0.0	0.0
467	0.0	0.0
468	0.0	0.0
469	0.0	0.0

470	0.0	0.0
471	0.0	0.0
472	0.0	0.0
473	0.0	0.0
474	0.0	0.0
475	0.0	0.0
476	0.0	0.0
477	0.0	0.0
478	0.0	0.0
479	0.0	0.0
480	0.0	0.0
481	0.0	0.0
482	0.0	0.0
483	0.0	0.0
484	0.0	0.0
485	0.0	0.0
486	0.0	0.0
487	0.0	0.0
488	0.0	0.0
489	0.0	0.0
490	0.0	0.0
491	0.0	0.0
492	0.0	0.0
493	0.0	0.0
494	0.0	0.0
495	0.0	0.0
496	0.0	0.0
497	0.0	0.0
498	0.0	0.0
499	0.0	0.0
500	0.0	0.0
501	0.0	0.0
502	0.0	0.0
503	0.0	0.0
504	0.0	0.0
505	0.0	0.0
506	0.0	0.0
507	0.0	0.0
508	0.0	0.0
509	0.0	0.0
510	0.0	0.0
511	0.0	0.0
512	0.0	0.0
513	0.0	0.0
514	0.0	0.0
515	0.0	0.0
516	0.0	0.0

517	0.0	0.0
518	0.0	0.0
519	0.0	0.0
520	0.0	0.0
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526	0.0	0.0
527	0.0	0.0
528	0.0	0.0
529	0.0	0.0
530	0.0	0.0
531	0.0	0.0
532	0.0	0.0
533	0.0	0.0
534	0.0	0.0
535	0.0	0.0
536	0.0	0.0
537	0.0	0.0
538	0.0	0.0
539	0.0	0.0
540	0.0	0.0
541	0.0	0.0
542	0.0	0.0
543	0.0	0.0
544	0.0	0.0
545	0.0	0.0
546	0.0	0.0
547	0.0	0.0
548	0.0	0.0
549	0.0	0.0
550	0.0	0.0
551	0.0	0.0
552	0.0	0.0
553	0.0	0.0
554	0.0	0.0
555	0.0	0.0
556	0.0	0.0
557	0.0	0.0
558	0.0	0.0
559	0.0	0.0
560	0.0	0.0
561	0.0	0.0
562	0.0	0.0
563	0.0	0.0

564	0.0	0.0
565	0.0	0.0
566	0.0	0.0
567	0.0	0.0
568	0.0	0.0
569	0.0	0.0
570	0.0	0.0
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662	0.1	11.4
663	0.1	11.5
664	0.1	11.6
665	0.1	11.7
666	0.1	11.8
667	0.1	11.9
668	0.1	12.0
669	0.1	12.1
670	0.1	12.2
671	0.1	12.3
672	0.1	12.4
673	0.1	12.6
674	0.2	25.3
675	0.2	25.5
676	0.2	25.7
677	0.2	25.9
678	0.2	26.1
679	0.2	26.3
680	0.2	26.5
681	0.2	26.7
682	0.2	26.9
683	0.2	27.1
684	0.2	27.3
685	0.2	27.5
686	0.2	27.7
687	0.2	27.9
688	0.3	42.1
689	0.3	42.4
690	0.3	42.7
691	0.3	43.1
692	0.3	43.4
693	0.3	43.7
694	0.3	44.0
695	0.3	44.3
696	0.3	44.6
697	0.4	59.8
698	0.4	60.2
699	0.4	60.6
700	0.4	61.0
701	0.4	61.4
702	0.4	61.8
703	0.4	62.2
704	0.4	62.6
705	0.4	63.0

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707	0.4	63.8
708	0.5	80.3
709	0.5	80.8
710	0.5	81.3
711	0.5	81.8
712	0.5	82.3
713	0.5	82.8
714	0.5	83.3
715	0.5	83.8
716	0.5	84.3
717	0.5	84.8
718	0.5	85.3
719	0.5	85.8
720	0.5	86.3
721	0.5	86.8
722	0.5	87.3
723	0.5	87.8
724	0.5	88.3
725	0.5	88.8
726	0.5	89.3
727	0.5	89.8
728	0.5	90.3
729	0.5	90.8
730	0.5	91.3
731	0.5	91.8
732	0.5	92.3
733	0.5	92.8
734	0.5	93.3
735	0.5	93.8
736	0.5	94.3
737	0.5	94.8
738	0.5	95.3
739	0.5	95.8
740	0.5	96.3
741	0.5	96.8
742	0.5	97.3
743	0.5	97.8
744	0.5	98.3
745	0.5	98.8
746	0.5	99.3
747	0.5	99.8
748	0.5	100.3
749	0.5	100.8
750	0.5	101.3
751	0.5	101.8
752	0.5	102.3
753	0.5	102.8

754	0.5	103.3
755	0.5	103.8
756	0.5	104.3
757	0.5	104.8
758	0.5	105.3
759	0.5	105.8
760	0.5	106.3
761	0.5	106.8
762	0.5	107.3
763	0.5	107.8
764	0.5	108.3
765	0.5	108.8
766	0.5	109.3
767	0.5	109.8
768	0.5	110.3
769	0.5	110.8
770	0.5	111.3
771	0.5	111.8
772	0.5	112.3
773	0.5	112.8
774	0.5	113.3
775	0.5	113.8
776	0.5	114.3
777	0.5	114.8
778	0.5	115.3
779	0.5	115.8
780	0.5	116.3
781	0.5	116.8
782	0.5	117.3
783	0.5	117.8
784	0.5	118.3
785	0.5	118.8
786	0.5	119.3
787	0.5	119.8
788	0.5	120.3
789	0.5	120.8
790	0.5	121.3
791	0.5	121.8
792	0.5	122.3
793	0.5	122.8
794	0.5	123.3
795	0.5	123.8
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797	0.5	124.8
798	0.5	125.3
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801	0.5	126.8

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809	0.5	130.8
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817	0.5	134.8
818	0.5	135.3
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822	0.5	137.3
823	0.5	137.8
824	0.5	138.3
825	0.5	138.8
826	0.5	139.3
827	0.5	139.8
828	0.5	140.3
829	0.5	140.8
830	0.5	141.3
831	0.5	141.8
832	0.5	142.3
833	0.5	142.8
834	0.5	143.3
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836	0.5	144.3
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838	0.5	145.3
839	0.5	145.8
840	0.5	146.3
841	0.5	146.8
842	0.5	147.3
843	0.5	147.8
844	0.5	148.3
845	0.5	148.8
846	0.5	149.3
847	0.5	149.8
848	0.5	150.3

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852	0.5	152.3
853	0.5	152.8
854	0.5	153.3
855	0.5	153.8
856	0.5	154.3
857	0.5	154.8
858	0.5	155.3
859	0.5	155.8
860	0.5	156.3
861	0.5	156.8
862	0.5	157.3
863	0.5	157.8
864	0.5	158.3
865	0.5	158.8
866	0.5	159.3
867	0.5	159.8
868	0.5	160.3
869	0.5	160.8
870	0.5	161.3
871	0.5	161.8
872	0.5	162.3
873	0.5	162.8
874	0.5	163.3
875	0.5	163.8
876	0.5	164.3
877	0.5	164.8
878	0.5	165.3
879	0.5	165.8
880	0.5	166.3
881	0.5	166.8
882	0.5	167.3
883	0.5	167.8
884	0.5	168.3
885	0.5	168.8
886	0.5	169.3
887	0.5	169.8
888	0.5	170.3
889	0.5	170.8
890	0.5	171.3
891	0.5	171.8
892	0.5	172.3
893	0.5	172.8
894	0.5	173.3
895	0.5	173.8
896	0.5	174.3

897	0.5	174.8
898	0.5	175.3
899	0.5	175.8
900	0.5	176.3
901	0.5	176.8
902	0.5	177.3
903	0.5	177.8
904	0.5	178.3
905	0.5	178.8
906	0.5	179.3
907	0.6	215.7
908	0.6	216.3
909	0.6	216.9
910	0.7	253.7
911	0.7	254.4
912	0.7	255.1
913	0.7	255.8
914	0.7	256.6
915	0.7	257.3
916	0.7	258.0
917	0.8	295.6
918	0.8	296.4
919	0.8	297.2
920	0.8	298.0
921	0.8	298.8
922	0.8	299.6
923	0.8	300.4
924	0.8	301.2
925	0.8	302.0
926	0.8	302.8
927	0.8	303.6
928	0.9	342.4
929	0.9	343.4
930	0.9	344.3
931	0.9	345.2
932	1.0	384.5
933	1.0	385.5
934	1.0	386.5
935	1.0	387.5
936	1.0	388.5
937	1.0	389.5
938	1.0	390.5
939	1.0	391.5
940	1.0	392.5
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943	1.0	395.5
944	1.0	396.5

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946	1.0	398.5
947	1.0	399.5
948	1.0	400.5
949	1.0	401.5
950	1.0	402.5
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952	1.0	404.5
953	1.0	405.5
954	1.0	406.5
955	1.0	407.5
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957	1.0	409.5
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959	1.0	411.5
960	1.0	412.5
961	1.0	413.5
962	1.0	414.5
963	1.0	415.5
964	1.0	416.5
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966	1.0	418.5
967	1.0	419.5
968	1.0	420.5
969	1.0	421.5
970	1.0	422.5
971	1.0	423.5
972	1.0	424.5
973	1.0	425.5
974	1.0	426.5
975	1.0	427.5
976	1.0	428.5
977	1.0	429.5
978	1.0	430.5
979	1.0	431.5
980	1.0	432.5
981	1.0	433.5
982	1.0	434.5
983	1.0	435.5
984	1.0	436.5
985	1.0	437.5
986	1.0	438.5
987	1.0	439.5
988	1.0	440.5
989	1.0	441.5
990	1.0	442.5
991	1.0	443.5

992	1.0	444.5
993	1.0	445.5
994	1.0	446.5
995	1.0	447.5
996	1.0	448.5
997	1.0	449.5
998	1.0	450.5
999	1.0	451.5
1000	1.0	452.5
1001	1.0	453.5
1002	1.0	454.5
1003	1.0	455.5
1004	1.0	456.5
1005	1.0	457.5
1006	1.0	458.5
1007	1.0	459.5
1008	1.0	460.5
1009	1.0	461.5
1010	1.0	462.5
1011	1.0	463.5
1012	1.0	464.5
1013	1.0	465.5
1014	1.0	466.5
1015	1.0	467.5
1016	1.0	468.5
1017	1.0	469.5
1018	1.0	470.5
1019	1.0	471.5
1020	1.0	472.5
1021	1.0	473.5
1022	1.0	474.5
1023	1.0	475.5
1024	1.0	476.5
1025	1.0	477.5
1026	1.0	478.5
1027	1.1	527.4
1028	1.1	528.5
1029	1.1	529.6
1030	1.1	530.7
1031	1.1	531.8
1032	1.1	532.9
1033	1.1	534.0
1034	1.2	583.8
1035	1.2	585.0
1036	1.2	586.2
1037	1.3	636.3
1038	1.3	637.7
1039	1.3	639.0

1040	1.4	689.5
1041	1.4	690.9
1042	1.5	741.8
1043	1.5	743.3
1044	1.5	744.8
1045	1.5	746.3
1046	1.5	747.8
1047	1.5	749.3
1048	1.5	750.8
1049	1.5	752.3
1050	1.5	753.8
1051	1.5	755.3
1052	1.5	756.8
1053	1.5	758.3
1054	1.5	759.8
1055	1.5	761.3
1056	1.5	762.8
1057	1.5	764.3
1058	1.5	765.8
1059	1.5	767.3
1060	1.5	768.8
1061	1.5	770.3
1062	1.5	771.8
1063	1.5	773.3
1064	1.5	774.8
1065	1.5	776.3
1066	1.5	777.8
1067	1.5	779.3
1068	1.5	780.8
1069	1.5	782.3
1070	1.5	783.8
1071	1.6	837.6
1072	1.7	891.6
1073	1.7	893.3
1074	2.0	1053.0
1075	2.0	1055.0
1076	2.0	1057.0
1077	2.0	1059.0
1078	2.0	1061.0
1079	2.0	1063.0
1080	2.0	1065.0
1081	2.0	1067.0
1082	2.0	1069.0
1083	2.2	1178.1
1084	2.4	1287.6
1085	3.0	1612.5
1086	3.0	1615.5
1087	3.2	1726.4

1088	3.5	1891.8
1089	3.5	1895.3
1090	3.5	1898.8
1091	4.0	2174.0
1092	4.0	2178.0
1093	4.0	2182.0
1094	4.5	2459.3

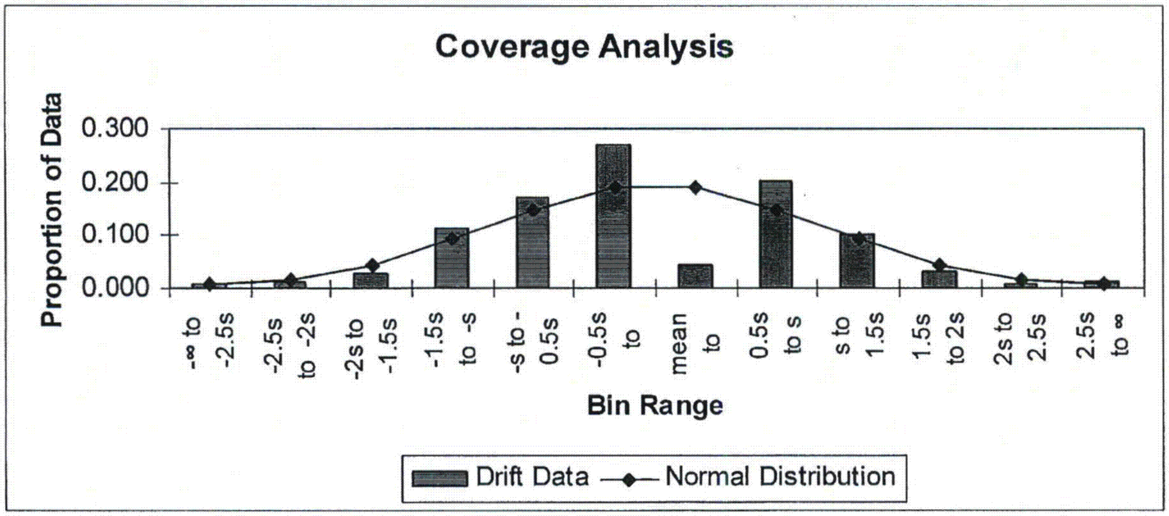
D' Test Analysis

D' Test		
S^2	852.5	
Total (n)	1094	
T	278877.9	
95% Significance Limits	9833.6	9959.7
D'	9551.5	

Since the result of the D' test show the calculated value of D' is outside the 95% significance interval, the assumption of normality is rejected. According to this statistical test, the data set does not fall under the criteria of a normal distribution.

Normality Test – Coverage Analysis

Bin #	Bin Range	# Per Bin	% Per Bin	Normal Distribution
1	-∞ to -2.5s	10	0.009	0.0062
2	-2.5s to -2s	14	0.013	0.0166
3	-2s to -1.5s	28	0.026	0.0440
4	-1.5s to -s	124	0.113	0.0919
5	-s to -0.5s	188	0.172	0.1498
6	-0.5s to $\bar{x}$	296	0.271	0.1915
7	$\bar{x}$ to 0.5s	47	0.043	0.1915
8	0.5s to s	220	0.201	0.1498
9	s to 1.5s	112	0.102	0.0919
10	1.5s to 2s	34	0.031	0.0440
11	2s to 2.5s	10	0.009	0.0166
12	2.5s to ∞	11	0.010	0.0062



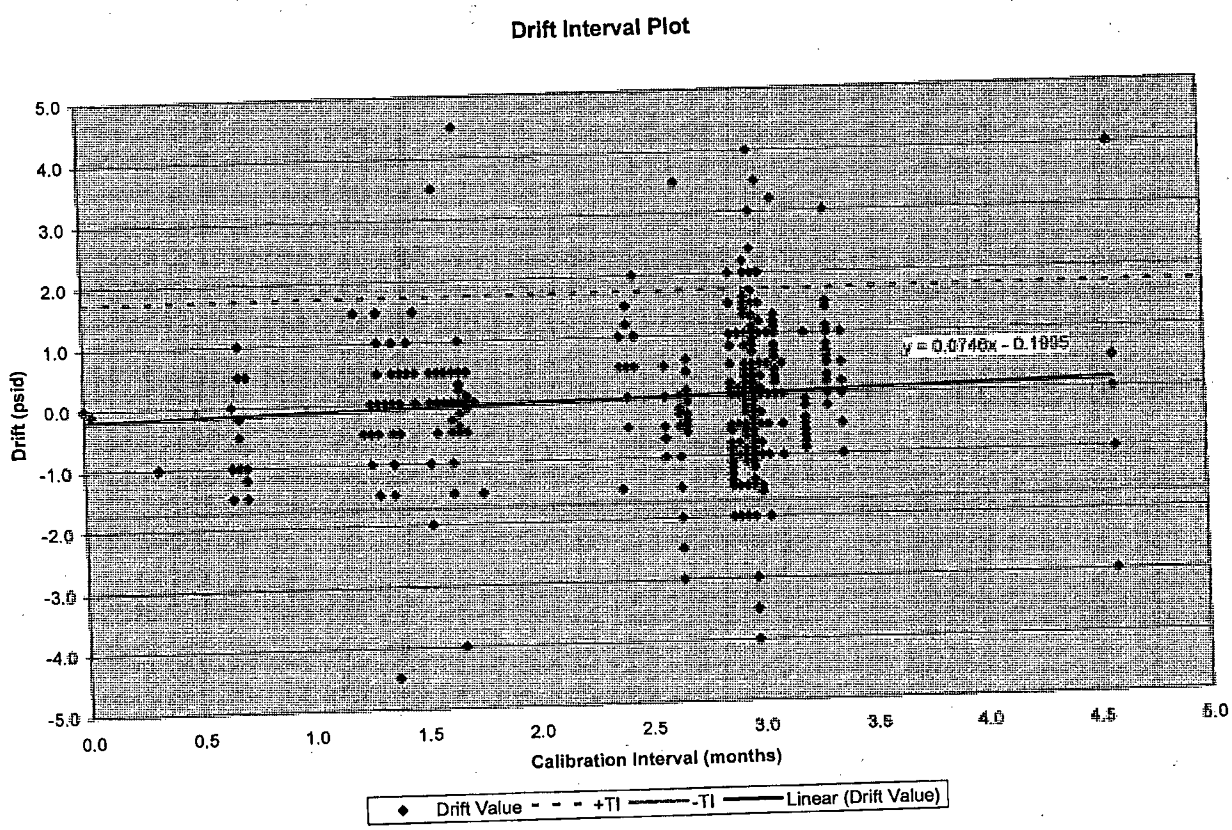
Of the 1094 data points, 1049 are found within 2 standard deviations of the mean. This is approximately equal to 95.9% of the data.

Drift Tolerance Interval (TI)

95%/95% Tolarance Interval

TI = s * TIF * NAF	
s =	0.88
TIF =	1.96
NAF =	1
TI =	**1.73**

Time Dependency Testing – Drift Interval Plot



Time Dependency Testing – Binning Analysis

1		2		3	
0 to 1.25 months		> 1.25 to 3.75 months		> 3.75 to 7.5 months	
CI (Months)	Drift (psid)	CI (Months)	Drift (psid)	CI (Months)	Drift (psid)
0.0	0.0	1.3	-0.5	4.6	4.0
0.0	-0.1	1.3	-0.5	4.6	-1.0
0.3	-1.0	1.3	-0.5	4.6	0.0
0.7	-1.5	1.3	-0.5	4.6	0.0
0.7	-1.0	1.3	-1.0	4.6	0.5
0.7	-1.0	1.3	-0.5	4.6	-1.0
0.7	0.0	1.3	0.0	4.6	0.0
0.7	0.5	1.3	1.5	4.6	0.0
0.7	-0.2	1.3	1.0	4.6	0.0
0.7	-0.5	1.3	1.0	4.6	0.0
0.7	-0.5	1.3	0.5	4.6	0.0
0.7	1.0	1.3	0.5	4.6	0.0
0.7	-1.0	1.3	-1.5	4.6	0.0
0.7	-0.5	1.3	0.5	4.6	0.0
0.7	0.5	1.3	1.0	4.6	0.0
0.7	0.5	1.3	0.0	4.6	-3.0
0.7	-1.2	1.3	1.0		
0.7	-1.5	1.3	0.0		
0.7	-1.0	1.3	0.5		
1.2	1.5	1.3	1.5		
1.2	-0.5	1.3	0.5		
		1.3	1.0		
		1.3	0.5		
		1.3	-0.5		
		1.3	1.0		
		1.3	0.5		
		1.3	0.0		
		1.3	0.0		
		1.3	0.0		
		1.3	0.0		
		1.3	0.0		
		1.4	-4.5		
		1.4	0.5		
		1.4	1.0		
		1.4	-1.0		
		1.4	-1.0		
		1.4	-0.5		
		1.4	0.5		
		1.4	-0.5		
		1.4	-1.5		

		1.4	-0.5		
		1.4	0.0		
		1.4	0.0		
		1.4	-1.0		
		1.4	-1.0		
		1.4	0.0		
		1.4	-1.0		
		1.4	-0.5		
		1.4	-0.5		
		1.4	0.5		
		1.4	0.0		
		1.4	-0.5		
		1.4	0.5		
		1.4	0.5		
		1.4	0.5		
		1.4	1.0		
		1.4	0.5		
		1.5	0.0		
		1.5	0.0		
		1.5	0.0		
		1.5	0.5		
		1.5	0.5		
		1.5	1.5		
		1.5	0.0		
		1.5	0.5		
		1.5	0.5		
		1.5	0.5		
		1.5	0.5		
		1.5	0.5		
		1.5	0.0		
		1.5	-2.0		
		1.5	0.0		
		1.5	-1.0		
		1.6	3.5		
		1.6	-0.5		
		1.6	-0.5		
		1.6	0.0		
		1.6	0.5		
		1.6	-0.5		
		1.6	0.5		
		1.6	0.0		
		1.6	0.0		
		1.6	-1.0		
		1.6	0.0		
		1.6	-1.5		
		1.6	0.5		
		1.6	-0.5		
		1.6	-0.3		

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		1.7	-0.4		
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		1.7	-0.5		
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		1.7	0.0		
		1.7	-0.2		
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		2.7	-0.4		
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		3.0	-0.5		
		3.0	1.0		
		3.0	0.5		
		3.0	1.3		
		3.0	-0.3		
		3.0	0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	-1.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	-1.0		
		3.0	1.0		
		3.0	-0.5		
		3.0	0.5		
		3.0	-0.5		

		3.0	0.5		
		3.0	1.0		
		3.0	-1.0		
		3.0	-1.0		
		3.0	-1.2		
		3.0	0.7		
		3.0	-0.8		
		3.0	0.4		
		3.0	1.1		
		3.0	-0.4		
		3.0	0.0		
		3.0	0.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	0.5		
		3.0	-0.5		
		3.0	3.0		
		3.0	4.0		
		3.0	0.0		
		3.0	-1.0		
		3.0	1.0		
		3.0	1.0		
		3.0	2.0		
		3.0	-0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	-1.0		
		3.0	1.0		
		3.0	-0.5		
		3.0	1.5		
		3.0	-2.0		
		3.0	0.9		
		3.0	0.5		
		3.0	-0.3		
		3.0	0.0		
		3.0	1.0		
		3.0	-0.6		
		3.0	0.0		
		3.0	0.5		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	0.0		
		3.0	0.0		
		3.0	-0.5		

		3.0	0.5		
		3.0	-1.0		
		3.0	0.5		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	0.0		
		3.0	-1.0		
		3.0	-0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	-1.0		
		3.0	0.8		
		3.0	-0.9		
		3.0	0.1		
		3.0	0.9		
		3.0	-0.4		
		3.0	-0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	-1.0		
		3.0	0.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	1.0		
		3.0	-0.5		
		3.0	-0.5		
		3.0	0.5		
		3.0	-1.0		
		3.0	1.0		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	-1.0		
		3.0	3.5		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	-0.5		
		3.0	-1.0		

		3.0	-0.5		
		3.0	0.0		
		3.0	0.5		
		3.0	0.5		
		3.0	-0.8		
		3.0	0.0		
		3.0	0.0		
		3.0	0.0		
		3.0	1.0		
		3.0	0.0		
		3.0	0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	-0.5		
		3.0	0.5		
		3.0	0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	0.0		
		3.0	-0.3		
		3.0	1.5		
		3.0	0.0		
		3.0	0.0		
		3.0	0.5		
		3.0	0.3		
		3.0	-1.5		
		3.0	1.0		
		3.0	0.0		
		3.0	1.0		
		3.0	-1.6		
		3.0	-0.5		
		3.0	-1.0		
		3.0	1.0		
		3.0	0.5		
		3.0	0.0		
		3.0	-1.0		
		3.0	0.0		
		3.0	0.0		
		3.0	1.5		
		3.0	1.0		
		3.0	0.0		
		3.0	1.0		
		3.0	0.5		
		3.0	0.0		
		3.0	0.1		
		3.0	-1.0		
		3.0	1.0		
		3.0	0.5		

		3.0	1.0		
		3.0	-1.5		
		3.0	1.0		
		3.0	0.5		
		3.0	1.0		
		3.0	1.0		
		3.0	1.2		
		3.0	0.5		
		3.0	1.0		
		3.0	1.0		
		3.0	0.0		
		3.0	-0.3		
		3.0	0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	0.5		
		3.0	-0.5		
		3.0	0.0		
		3.0	2.0		
		3.0	0.5		
		3.0	1.5		
		3.0	-1.0		
		3.0	0.0		
		3.0	0.5		
		3.0	0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	1.0		
		3.0	0.5		
		3.0	0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	0.5		
		3.0	0.5		
		3.0	0.0		
		3.0	0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	0.5		
		3.0	-0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	0.5		
		3.0	-1.0		
		3.0	0.5		
		3.0	0.0		
		3.0	0.0		
		3.0	0.5		

		3.0	-2.0		
		3.0	-0.5		
		3.0	0.0		
		3.0	0.5		
		3.0	1.0		
		3.0	0.0		
		3.0	-0.5		
		3.0	1.0		
		3.0	1.0		
		3.1	1.0		
		3.1	1.1		
		3.1	0.8		
		3.1	1.3		
		3.1	0.2		
		3.1	3.2		
		3.1	0.8		
		3.1	0.3		
		3.1	1.2		
		3.1	0.7		
		3.1	0.4		
		3.1	0.0		
		3.1	0.6		
		3.1	0.8		
		3.1	0.7		
		3.1	0.3		
		3.1	-0.5		
		3.1	-1.0		
		3.1	-1.0		
		3.1	-1.0		
		3.1	0.0		
		3.1	-1.0		
		3.1	-0.5		
		3.1	-1.0		
		3.1	0.0		
		3.1	-1.0		
		3.1	-0.5		
		3.1	-0.5		
		3.1	0.0		
		3.1	0.5		
		3.1	0.0		
		3.1	-0.5		
		3.2	-0.5		
		3.2	-0.4		
		3.2	1.0		
		3.2	-0.6		
		3.2	-0.9		
		3.2	-0.2		
		3.2	-0.1		

		3.2	-0.7		
		3.2	-0.4		
		3.2	-0.1		
		3.2	-0.2		
		3.2	-0.5		
		3.2	-0.8		
		3.2	-0.5		
		3.2	-0.4		
		3.2	-0.2		
		3.3	1.0		
		3.3	3.0		
		3.3	1.1		
		3.3	1.0		
		3.3	-0.2		
		3.3	1.5		
		3.3	1.0		
		3.3	1.0		
		3.3	0.6		
		3.3	1.0		
		3.3	0.8		
		3.3	1.0		
		3.3	0.5		
		3.3	0.5		
		3.3	1.4		
		3.3	1.5		
		3.3	1.1		
		3.3	1.5		
		3.3	0.2		
		3.3	0.5		
		3.3	0.3		
		3.3	0.5		
		3.3	0.0		
		3.3	0.0		
		3.3	0.8		
		3.3	1.0		
		3.3	1.1		
		3.3	1.0		
		3.3	0.7		
		3.3	1.5		
		3.3	0.3		
		3.3	1.5		
		3.4	0.5		
		3.4	-0.5		
		3.4	0.0		
		3.4	0.5		
		3.4	-0.5		
		3.4	0.5		
		3.4	-0.5		

		3.4	-1.0		
		3.4	0.0		
		3.4	0.0		
		3.4	-0.5		
		3.4	1.0		
		3.4	0.2		
		3.4	0.5		
		3.4	0.0		
		3.4	0.0		

Bin #	Bin Range (months)	Count	% of Total Data	Valid? YES/NO
1	0 to 1.25	21	1.9	NO
2	> 1.25 to 3.75	1057	96.6	YES
3	> 3.75 to 7.5	16	1.5	NO

Bin #	Drift Average	Drift Standard Deviation	Average CI	Data Count
1	-0.4	0.82	0.7	21
2	0.0	0.88	2.8	1057
3	0.0	1.35	4.6	16

ESM-03.02-APP-III sets forth criteria to perform the binning analysis. One of the requirements is that there are multiple valid bins. A bin is considered valid if it contains at least 5 data points and 10% of the total data. Only the middle bin (> 1.25 to 3.75) meets the criteria. Therefore, the complete binning analysis cannot be performed on this data. Per the instruction in ESM-03.02-APP-III, the data is considered **moderately time dependent.**