



Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
Buchanan, NY 10511-0249

Robert Walpole
Licensing Manager
Tel (914) 734-6710

October 5, 2007

Re: Indian Point Unit 3
Docket 50-286

NL-07-121

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

SUBJECT: **Response to Second Request for Additional Information Regarding Relief Request 3-43 for Temporary Repair to Service Water Pipe**

- References:
1. Entergy letter NL-07-118 dated September 27, 2007 regarding Relief Request 3-43 for Temporary Repair to Service Water Pipe.
 2. Entergy letter NL-07-120 dated October 3, 2007 regarding Response to Request for Additional Information for Relief Request RR 3-43.

Dear Sir or Madam:

Entergy Nuclear Operations, Inc (Entergy) is providing this response to a request for additional information regarding Relief Request RR 3-43 (Reference 1) as revised by Reference 2. NRC staff discussed this request for additional information with Entergy during a conference call on October 4, 2007. The additional information being provided (Attachments 1 and 2) does not result in a change to the Relief Request 3-43, Revision 1 submitted in Reference 2.

There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at (914) 734-6710.

Sincerely,

Robert Walpole
Licensing Manager
Indian Point Energy Center

cc: next page

A047
MRR

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region 1
NRC Resident Inspector, IP3
Mr. Paul D. Tonko, President NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT 1 TO NL-07-121

REPLY TO SECOND REQUEST FOR ADDITIONAL INFORMATION
REGARDING INDIAN POINT 3 RELIEF REQUEST 3-43 FOR
TEMPORARY NON-CODE REPAIR TO SERVICE WATER PIPING

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

REPLY TO SECOND REQUEST FOR ADDITIONAL INFORMATION
REGARDING RELIEF REQUEST 3-43

The following information is being provided based on a conference call between NRC staff and Entergy Nuclear Operations, Inc on October 4, 2007 regarding Relief Request (RR) 3-43 submitted September 27, 2007 (NL-07-118) and as revised October 3, 2007 (NL-07-120). This additional information does not change Revision 1 of RR 3-43 provided in the October 3, 2007 submittal.

NRC Question 1:

In Attachment 3, page 6, Section 6.3, the licensee stated that the minimum required wall thickness was determined by UT readings. In Section 6.4, the licensee stated that the wall thickness used for the Code case N-513-1 evaluation was based on the average value of the thickness around the thinned area of the pipe.

- (a) Discuss why two different approaches are used to in determining the wall thickness.
- (b) Discuss for each approach whether the conservative wall thickness is used.
- (c) Explain Item 2 in Section 6.3.

Entergy Response:

- a) There are two thickness values established for two different purposes in the flaw evaluation provided as Attachment 3 to the Entergy letter dated October 3, 2007.
 1. The minimum required wall thickness was calculated based on the USAS B31.1.0 Power Piping Code using the highest value of:
 - i) The stress value based on the pressure / hoop stress,
 - ii) The mechanical stress, or
 - iii) The administrative limit of 20%.For this situation, the pressure / hoop stress is limiting. This is the approach used for establishing the wall thickness acceptance criterion limit for identifying a flaw.
 2. The other wall thickness value used in Attachment 3 is developed based on results of field measurements obtained using ultrasonic testing (UT). This wall thickness value is used for evaluating flaw acceptability per Code Case N-513-1.
- b) The wall thickness values for both purposes are conservative. Calculation of minimum required wall thickness incorporates the inherent conservatism from the Power Piping Code. Determination of wall thickness based on UT measurements conservatively used that average thickness in the vicinity of the flaw instead of averaging the larger thickness around the entire pipe.
- c) The method discussed in item 2 of section 6.3 of the calculation describes the method of increasing the calculated pipe stress to account for the reduced section of the metal due to corrosion. There are two methods that can be used; 1) assume the pipe is uniformly thinned around the entire pipe based on the lowest measured value or 2) calculate the section modulus and other properties based on actual UT measurements. For this situation, Entergy used method 2. Code Case N-513-1 requires that periodic examinations of no more than 90-

day intervals be conducted to verify values used in the flaw growth evaluation. Entergy expects to implement a repair before the next examination is due.

NRC Question 2:

In Attachment 3, page 6, Section 6.6, the licensee referenced the 1995 edition of the ASME Code, Section XI, Appendix H in evaluating the flaw(s). However, as stated on page 1 of Attachment 2, the code of record is the 1989 edition. Explain why the 1995 edition of the code is used.

Entergy Response:

The K1c and J1c values needed for the flaw evaluation are not reported in the 1989 Edition of Section XI, so the procedure for flaw evaluation references the 1995 Edition for these values. The current code of record for repair and replacement activities at IP3 is the 2001 Edition through 2003 Addenda, as explained on page 1 of Attachment 2. Entergy has confirmed that coefficient values used in the flaw evaluation are consistent with the code of record.

NRC Question 3:

In Attachment 3, page 7, the licensee used 1.00 for the stress intensification factor (SIF) of the leak location. As the licensee indicated the value of 1.00 is for a pipe configuration. However, the pinholes are located in the part of the elbow, albeit on the straight end/section of the elbow, as shown in the photos that the licensee provided to the NRC. In addition, the pin holes are located close to the weld joining the elbow to the flange. The pinhole location would experience stress concentration because of their proximity to the weld. The purpose of the SIF is to model the piping loads in the analysis to account for the stress concentration at a piping location due to configuration or discontinuity. The staff believes that a SIF for the elbow should be used which is higher than 1.0. Justify why the SIF of 1.0 is acceptable.

Entergy Response:

The SIF of 1.0, actually a value of .75 equal to 1.0, was used to remove the over conservatism caused by using the Elbow SIF over the entire length of the elbow. As the Companion Guide to the ASME BPVC, page 555 states "the SIF at an elbow is maximum at the 45 degrees location." This accounts for the bucking at the out of plane which occurs at the center of the elbow only. Since the leak and thinned area is approximately 3" from the elbow weld, an SIF for a straight pipe was used. In addition, since the flaw is near the weld to the flange an as-welded SIF can be used. For the B31.1 1967 edition of the code the as-welded SIF is 1.3, therefore the .75i would also be 1.0.

NRC Question 4:

In Attachment 3, page 10, the licensee showed the equations for Fm and Fb, the parameters for circumferential flaw, are calculated. However, the equations and associated coefficients do not seem to be consistent with that of Appendix H of the ASME Code Section XI (the 1995 edition). Explain.

Entergy Response:

The equations and coefficients are taken from Appendix I of Code Case N-513-1. The numbers displayed on calculation sheet are truncated to fit the spreadsheet format used for the calculation.

NRC Question 5:

In Attachment 3, page 11, the licensee stated that after weld overlay the SIF needs to be 2.1 for even a straight pipe. Explain why a SIF of 2.1 is used after weld overlay.

Entergy Response:

This is from the requirement of Code Case N-661. The calculation was performed assuming the possible repair was going to be a weld overlay. If an overlay was performed then the code case requires an SIF of 2.1. This is derived from the as-welded SIF requirements contained in the later code versions. The statement is intended to state that stress requirements are met with the repair and an SIF of 2.1.

NRC Question 6:

Section 2(e), 2(f), 2(g), and 2(h) of Code case N-513-1 requires frequent periodic inspection or performing a flaw growth evaluation. Please address the requirements in each of these sections because it is not evident in the submittal that the licensee has met the requirements of N-513-1.

Entergy Response:

Entergy is implementing the requirements of Sections 2(e), 2(f), 2(g), and 2(h) of Code case N-513-1, where applicable for this situation. Evaluation of the flaw has been completed per Section 2(e) and as documented in the calculation IP-CALC-07-00083 provided to NRC (Attachment 3 of Entergy Letter NL-07-120 dated October 3, 2007). The operability evaluation performed for this condition recommended a 30-day time frame for completing a repair. Therefore, Code Case 513-1 requirements in section 2(e) that extend beyond 30 days would not be applicable, unless new data and an updated evaluation support a repair timeframe of longer than 30 days. Daily walkdowns are being performed per Section 2(f). Sections (g) and (h) pertain to performing a repair or replacement. Entergy is requesting NRC approval of Relief Request 3-43, Revision 1 to support our planned repair.

NRC Question 7:

For the flaw characterization and evaluation, identify any deviation from Code Case N-513-1 and other applicable code guidance or requirements including justification.

Entergy Response:

Entergy is following the requirements of Code Case N-513-1 for flaw characterization and evaluation as documented in Entergy Calculation IP-CALC-07-00083.

NRC Question 8:

Discuss and provide a report to show how the corrosion rate of 0.012 inches per year was determined. Discuss and provide the results of local corrosion rate.

Entergy Response:

The corrosion rate value of 0.024 inches per cycle, or 0.012 inches per year is a historical value developed over several years of evaluating service water piping systems and corrosion degradation at IP2 and IP3. There is not a reference document for this value. Local corrosion rates can depend on many factors and Entergy has not developed a standard value to be assumed for local corrosion. The proposed repair does not depend on a precise value for corrosion rate, because Entergy will be monitoring for additional degradation and repair integrity by daily walkdowns and periodic UT examinations as stated in Section E.4 of Relief Request 3-43 and in response to NRC Question 10.

NRC Question 9:

Identify the code requirements for design, fabrication and NDE of the proposed repair (plate and weld). Identify any deviations from such code requirements with justification.

Entergy Response:

The code requirements for design, fabrication, and NDE of the proposed repair are per original design requirements in B31.1 (1967). There have been no deviations from this code.

NRC Question 10:

Perform UT examination on pipe area adjacent to the repair weld (a band of three inches) to monitor the extent of degradation.

Entergy Response:

The scope of the inservice monitoring described in Section E.4 of Relief Request 3-43, Revision 1 will include UT within a 3-inch band around the top and side perimeters of the repair weld to monitor for degradation. The base of the repair weld is adjacent to the bolting flange for this elbow, so that a full 3-inch band is not available. The UT will extend as far as practical beyond the base of the repair.

NRC Question 11:

Please provide the UT report for the measurements recently taken using a ¼-inch grid.

Entergy Response:

UT Report IP3-UT-07-111 using the ¼-inch grid is provided in Attachment 2. This UT exam provides for a more detailed inspection of two regions within the coverage of the UT exam previously performed with a 1-inch grid as documented in UT Report IP3-UT-07-110.

ATTACHMENT 2 TO NL-07-121

REPLY TO SECOND REQUEST FOR ADDITIONAL INFORMATION
REGARDING INDIAN POINT 3 RELIEF REQUEST 3-43 FOR
TEMPORARY NON-CODE REPAIR TO SERVICE WATER PIPING

Ultrasonic Test Results for Area Downstream of SWN-38

IP3-UT-07-111, September 2007 (1/4" grid)

ENERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

UT Erosion/Corrosion Examination

Handwritten: IP3-UT-07-111

Micro: IP3 Procedure: ERN-NDE-9.05 Outage No.: N/A
 Summary No.: 18" Line # 408 Procedure Rev.: 1 Report No.: IP3-UT-07-111
 Work order: BOP Work Order No.: 00123409-02 Page: 1 of 4

Code: ANSI E51.1 1967 Ed. Thru 1969 Add. Cat./Item: N/A Location: PAB / Minim Containment

Drawing No.: 9321-F-27223 Description: Characterize areas of wall thinning, reference report IP3-UT-07-110.

System ID: Service Water

Component ID: 18" Line # 408 D/S of valve SWN-38 Size/Length: 18" Sch STD Thickness/Diameter: 0.375"

Limitations: None Component File No.: SWN38-SM1 & SM2 Start Time: 1200 Finish Time: 1530

Calibration Information			
Calibration Thickness (in)		Calibration Times / Initials	
.040"	.500"	Start: <u>1300</u>	<u>REA</u>
.100"	N/A	Verify: <u>1325</u>	<u>REA</u>
.200"	N/A	Verify: <u>N/A</u>	
.300"	N/A	Verify: <u>N/A</u>	
.400"	N/A	Final: <u>1355</u>	<u>REA</u>

Partitioning Information		
Component	Begin/Col/Row	Ending/Col/Row
M. UPST Ext.	<u>N/A</u>	
Main UPST.	<u>N/A</u>	
Main	<u>N/A</u>	
Main DNST.	<u>N/A</u>	
M. DNST Ext.	<u>N/A</u>	
Branch	<u>N/A</u>	
Branch Ext.	<u>N/A</u>	

Component Information	
Component Geometry:	<u>Pipe Elbow</u>
Outside Diameter:	<u>18"</u> Grid Size: <u>.25"x.25"</u>
Max. Thickness:	<u>.254"</u> Min. Thickness: <u>.032"</u>
Nominal Thickness:	<u>.375"</u> Tmin.: <u>.090"</u>
Min. Thickness Location:	<u>SM2 location J5 & K5</u>
Max. Thickness Location:	<u>SM2 location A9</u>

Instrument: Manufacturer: Panametrics Transducer: _____ Reference/Simulator Block: _____ Temp. Tool: _____
 Model: 37DL+ Manufacturer: Panametrics Serial No.: A23867 Manufacturer: Control Co., Inc
 Serial No.: 031110106 Serial No.: 536066 Type: C/S .04"-.5" Serial No.: QS-77
 Gain: 50 dB Size: 0.2" Freq.: 7.5 MHZ Ref./Simulator Block Temp.: 87.1 °F Couplant: _____
 Range: 1.0" Model: D798 Material/Component Temp.: 84.7 °F Type: Ultragel
 # of Elements: Dual Batch No.: 05325

Comments/Obstructions: Sub-micro grid of the thinner elbow areas show by report IP3-UT-07-110.

Results: Accept Reject Info Tmin = .090" per IP-CALC-07-00083.

Examiner	Level	III-PDI	Signature	Date	Reviewer	Signature	Date
Allen II, Robert E.			<i>[Signature]</i>	9/20/2007	N/A		
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Michael A. Terpening	<i>[Signature]</i>	9/24/07
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					N/A		

Supplemental Report

Report No. IP3-UT-07-111

Page 2 of 4

Entergy

Summary No.: 18" Line # 408

Examiner: Allen II, Robert E. *[Signature]*
Examiner: N/A
Other: N/A

Level: III-PDI
Level: N/A
Level: N/A

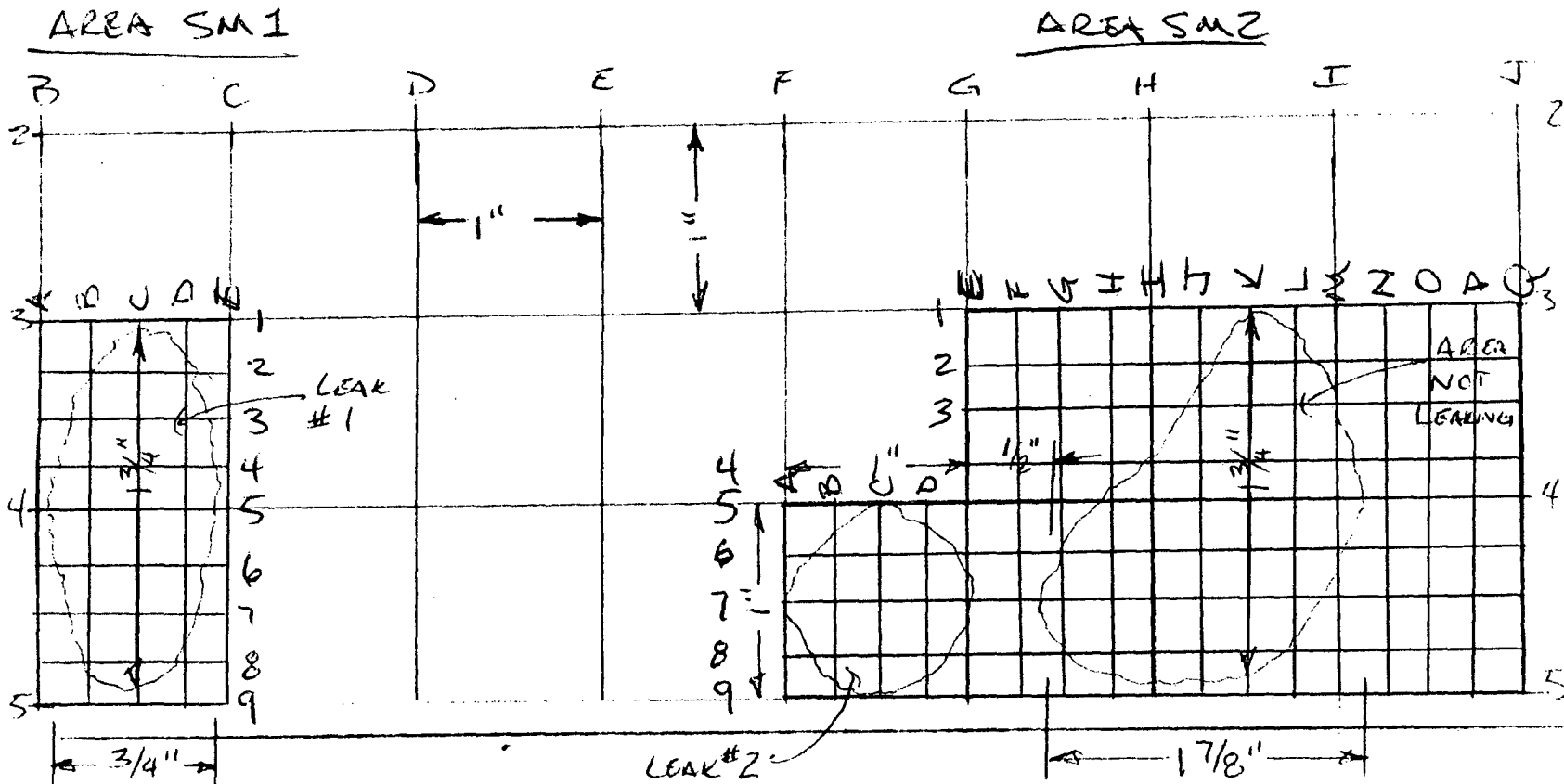
Reviewer: N/A
Site Review: *Michael A Ferrening*
ANII Review: N/A

Date: _____
Date: 9/24/07
Date: _____

Comments: Sketch of sub-micro grid shown below superimposed over the micro grid established by report IP3-UT-07-110.


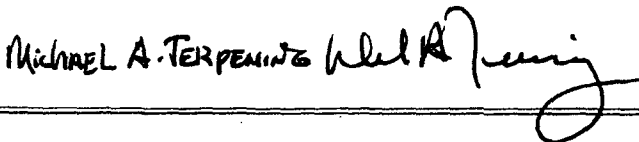
.25" X .25" GRIDS

Sketch or Photo:



Win37DLPlus Data Grid

18" Line # 408, D/S Valve SWN-38

File Name: SWN38-SM1	Survey Date: 9/20/2007
File Type: 2D Grid	Minimum thickness: .061" @ B5
File Description: Sub-Micro Grid 1	Maximum thickness: .184" @ A9
Location Note: IP3	Report No.: IP3-UT-07-111
Inspector ID: Robert Allen 	Page 3 of 4
Reviewer:  MICHAEL A. TERPENING	

0.000	A	B	C	D	E	Min	Max	Avg
1	0.153	0.140	0.122	0.115	0.140	0.115	0.153	0.134
2	0.120	0.109	0.085	0.075	0.128	0.085	0.128	
3	0.118	0.073	0.070	0.134	0.116	0.070	0.134	
4	0.136	0.078	0.077	0.080	0.137	0.078	0.137	
5	0.125	0.061	0.088	0.088	0.152	0.061	0.152	
6	0.121	0.081	0.081	0.113	0.168	0.081	0.168	0.117
7	0.121	0.089	0.089	0.129	0.162	0.089	0.162	0.118
8	0.146	0.109	0.109	0.114	0.125	0.109	0.146	0.115
9	0.184	0.148	0.140	0.114	0.124	0.114	0.184	0.142
Min	0.118	0.061	0.070	0.080	0.116			
Max	0.184	0.148	0.140	0.134	0.168			
Avg	0.136	0.109	0.109	0.114	0.139			
TMin	0.061							
TMax	0.184							
TAvg	0.116							

Color Legend

Over Range	
Not Used	
Not Used	0.184
0.150 - 0.184	0.150
0.109 - 0.150	0.109
0.000 - 0.090	0.090
Under Range	0.000

Win37DLPlus Data Grid
18" Line # 408, D/S *ive* SWN-38

File Name: SWN38-SM2 File Type: 2D Grid File Description: Sub-Micro Grid 2 Location Note: IP3 Inspector ID: <i>Robert Allen</i> Robert Allen	Survey Date: 9/20/2007 Minimum thickness: .032" @ J5 & K5 Maximum thickness: .254" @ A9 Report No.: IP3-UT-07-111 Page 4 of 4 Reviewer: <i>Michael A. Terpenitz</i>
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Min	Max	Avg
1	0.000	0.000	0.000	0.000	0.208	0.211	0.192	0.199	0.187	0.181	0.156	0.172	0.200	0.205	0.216	0.225	0.226	0.156	0.226	0.198
2	0.000	0.000	0.000	0.000	0.179	0.212	0.202	0.157	0.143	0.115		0.118	0.135	0.211	0.205	0.215	0.237		0.237	0.171
3	0.000	0.000	0.000	0.000	0.186	0.197	0.175	0.130	0.114	0.084	0.066		0.136	0.193	0.216	0.228	0.238	0.066	0.238	0.158
4	0.000	0.000	0.000	0.000	0.173	0.166	0.178	0.161	0.084	0.044	0.042	0.077		0.180	0.179	0.215	0.234	0.042	0.234	0.140
5	0.176	0.159	0.162	0.152	0.154	0.141	0.149	0.114	0.083	0.032	0.032	0.053	0.083		0.199	0.216	0.233	0.032	0.233	0.132
6	0.134		0.127	0.145	0.148	0.126	0.110	0.103	0.073	0.043	0.042	0.053	0.105	0.099	0.199	0.213	0.221	0.042	0.221	0.122
7	0.123		0.083	0.081	0.152	0.139	0.067	0.071	0.053	0.073	0.054	0.084	0.126	0.130	0.219	0.200	0.229	0.054	0.229	0.118
8	0.170	0.061	0.059	0.060	0.147	0.162	0.074	0.073	0.104	0.097	0.071	0.112	0.141	0.172	0.221	0.222	0.226	0.059	0.226	0.128
9	0.254	0.166	0.195	0.121	0.157	0.175	0.112	0.122	0.114	0.119	0.123	0.149	0.156	0.197	0.186	0.201	0.228	0.112	0.254	0.163
Min	0.123	0.061	0.059	0.060	0.147	0.126	0.067	0.071	0.053	0.032	0.032	0.053	0.083	0.099	0.179	0.200	0.221			
Max	0.254	0.166	0.195	0.152	0.208	0.212	0.202	0.199	0.187	0.181	0.156	0.172	0.200	0.211	0.221	0.228	0.238			
Avg	0.171	0.117	0.125	0.112	0.167	0.170	0.140	0.127	0.113	0.083	0.076	0.101	0.131	0.165	0.204	0.215	0.230			
TMin	0.032																			
TMax	0.254																			
TAvg	0.145																			

Color Legend

Over Range	
Not Used	
Not Used	
0.150 - 0.254	0.254
0.109 - 0.150	0.150
0.053 - 0.110	0.109
0.000 - 0.090	0.090
Under Range	0.000