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# CPU Meeting Materials

Weekly Non-Destructive Examination Program Updates

March 1, 2014

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- PG&E/SEI Alignment
  - L-114
  - Extent of Conditions for TCI Inspections
  - NDE Program Enhancements
  - NDE Program Validation Protocols/Extent of Conditions (LLNL)
  
- Completed Activities To Date
  
- Next Steps
  - Schedule
  - Immediate Needs



- See presentation dated 12/6/13 and 12/13/13 for past items
- Leak Survey details
  - Leak Survey began on 600 miles of identified Gas Transmission pipeline (12/2/2013)
  - February Leak Survey Finalized :
    - 17 total indications from aerial survey
    - 6 total indications were found to be PG&E Leak
      - (2) Grade 3 within regulator station (Sonoma and North Bay)
      - (3) Gas Racks Venting (normal operation)
      - (1) indication from removal of "Pig" at launcher site
    - Zero leaks found on weld (Girth or Long Seam)
- LLNL finalizing "Review of PG&E Proposed Dig Plan"
  - Established 3 alternatives
    - Re-inspection/Digs with 5% error
    - Re-Inspection/Digs with 2% error
    - Comprehensive analysis of weld inspections through existing film
      - PG&E working to secure LLNL's services for Comprehensive analysis

<sup>1</sup>Activity progress/completion is discussed in the Completed Activities To Date section

<sup>2</sup>Dates are contingent on weather, permit, and/or construction schedules

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## LLNL Recommended Alternative

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- Comprehensive Analysis Alternative
  - Analyze all film for 488 non-compliant welds
  - Establish conditional probability of weld flaws being present by utilizing rejection information from construction
  - Utilize probability of weld flaws within population of 488
  - Utilize non-compliant weld film and establish total % of area that can detect
  - Determine population of welds requiring re-inspection
  - Dig/Re-inspect welds requiring it
    - Speculation that many of the required digs will be of the 43 PG&Es already re-inspected
    - Will need to confirm once analysis is complete
  - LLNL to issue final summary report by end of next week (3/14/2014)

<sup>1</sup>Activity progress/completion is discussed in the Completed Activities To Date section

<sup>2</sup>Dates are contingent on weather, permit, and/or construction schedules

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# NDE Program Enhancements

PG&E NDE Enhancements	Date of Implementation
Developed a specification to establish the minimum requirements for the qualification of personnel and performance of Non Destructive Examination (NDE) services on PG&E Gas Operation assets - "GO-TS-00	✓ Q2- 2013
Execution of facility and NDE program audits of all service providers to verify competency of NDE agency.	✓ Q3- 2013
Publication of a Manual for PG&E Non Destructive Examination work – "Non Destructive Examination Code Manual - "TD-4190M"	✓ Q3 - 2013
All Contractor NDE procedures will be reviewed and approved by qualified PG&E NDE staff. PG&E requires mandatory Radiography quality requirements above and beyond API 1104 20 <sup>th</sup> .	April 15, 2014
Proficiency testing of NDE personnel is required in addition to contractor awarded certifications. PG&E shall administer additional Specific and Practical examinations to confirm their knowledge of PG&E requirements and expectations.	April 15, 2014
A PG&E endorsement card will be issued to the contractor certification. All contractor supplied technicians will require both a valid contractor certification and PG&E endorsement to perform NDE services on PG&E work. (Currently 16 NDE technicians have successfully proficiency tested).	April 15, 2014
In the field oversight of NDE technicians working in the field by qualified PG&E NDE staff to ensure the quality and reliability of NDE inspection results. (53 total field observations were completed in 2013). Current oversight frequency is weekly.	✓ Q3 - 2012
PG&E has made mandatory that NDE contractors develop and perform a process of self-checking their technicians. NDE Contractors shall submit to PG&E a minimum of one observation (completed by a senior member of the NDE Contractor organization) per quarter per project site worked on.	April 15, 2014
Online Operator Qualification (VeriForce) Training modules developed for contractor NDE personnel.	✓ Q3- 2013
Prepared specific Radiography procedures for the inspection of Pressure Control Fittings (PCF).	✓ Q4 - 2013



# NDE Program Validation Protocols

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- See presentation from 2/7/2014 for previous notes
  - Provided sample documents for LLNL to review (LLNL received on 2/3/14)
    - Summary Reader sheets
    - Weld X-Ray films
    - Comprehensive review data
  - LLNL currently concentrating on TCI Validation Workstream before progressing
    - LLNL estimates Comprehensive analysis to take 12 Weeks
    - PG&E working with LLNL to reduce the overall lead time to complete
  - PG&E currently working on the following:
    - Establishing GIS data set for all pipe segments within areas susceptible to ground movement
    - Investigating records for segments within areas susceptible to ground movement



## Completed Activities to Date

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- See 2/7/14 presentation for items prior to 2/1/14
- Excavated/Tested/Passed 41 welds as of 3/5/14:
  - 5 welds on L-132
  - 12 welds at Vernalis Station
  - 2 welds at 8 Mile Rd Pressure Limiting Station (PLS)
  - 4 welds on L-108 (MLV38.1)
  - 4 welds at Gateway Generating Station
  - 8 welds at L-108 (MLV38.17)
  - 3 welds on DFM-1616
  - 3 welds on L-331A (WV-7)
- Completed L-114 Final Report
- Created Maps of pipeline segments to be Leak Surveyed as a result of L-114 Findings
- Completed 3 monthly Leak Surveys of 600 miles of pipeline
  - Zero leaks on welds have been found



- High Level activities within the next 6 Weeks
- See 2/7/14 presentation for prior items:
- Inspection of all 43 TCI Welds [3/31/14]
  - 41 welds verified to date; all acceptable weld quality per API 1104
  - WV-4A/B/C (Stockton) verified on 2/18/2014 (3 Welds)
  - WV-7A (Gustine) verified on 3/4/2014 (3 Welds)
  - WV-8A (Dunnigan) scheduled for 3/7/2014 (2 welds)
- LLNL to validate TCI Dig plan and issue recommendations if necessary (43 digs) (3/1/2014)
- LLNL to recommend validation protocol for remainder of pipe segments required to have been inspected by radiographic inspection methods.
- Establish LLNL contract update for analysis associated with recommended alternative for TCI Validation
  - LLNL to perform analysis of all film analysis recommendations for re-inspection
  - PG&E's contract in progress currently
- Issue revised standards/Testing/Training for NDE Program (4/15/2014)





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# Appendix I

## Summary of WV-7A Re-Inspections

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**Technical Services, Inc.**

P. O. Box 721139, Houston, Texas 77272-1139

Cell: (281) 389-4304

Ph: (281) 341-0469

Email: [david.culbertson@ndttechservices.com](mailto:david.culbertson@ndttechservices.com)

[www.ndttechnicalservices.com](http://www.ndttechnicalservices.com)

**SUMMARY AND ASSESSMENT OF EOC – RE-INSPECTION PERFORMED ON GIRTH WELDS**

In accordance with the approved PG&E Inspection Test Plan (ITP), on March 4, 2014 a re-inspection utilizing radiographic examination with AGFA D4 film was performed on three (3) girth welds at verification dig site WV-7A (Redacted) in Gustine, CA. Once each of the welds were radiographed they were “fingerprinted” (weld features compared against original images) to verify that the original radiographic film images of the weld matched the images of the re-inspected girth weld.

The following weld numbers were re-inspected:

<u>Original Weld Id Number</u>	<u>Re-inspection Weld Id Number</u>
Location: 7A      W-6	W-6-RI
Location: 7A      T-2	T-2-RI
Location: 7A      T-3	T-3-RI

The following were the results of these-inspections:

- Weld Number: W-6-RI      Comments: Weld matched fingerprint and weld was determined to be acceptable to API 1104, 20th edition.
- Weld Number: T-2-RI      Comments: Weld matched fingerprint and weld was determined to be acceptable to API 1104, 20th edition.
- Weld Number: T-3-RI      Comments: Weld matched fingerprint and weld was determined to be acceptable to API 1104, 20th edition.

Location 7A contained three (3) 20 in. OD girth weld identified as Weld #6, T2, & T3.

During review of the radiographic film for Weld T3-RI, a darken indication (indicated by greater film density) was noted between location markers 38-42. The indication was interpreted to be an area of low reinforcement in the weld cover pass and was determined to be acceptable to API 1104, 20th edition. To verify this conclusion, WIX performed a visual examination of this area that concluded the indication did not exceed 1/32 inch in depth. (See attached photos of the weld cover pass within the

region of interest). A copy of WIX's Radiographic Testing Inspection report indicating the results of their evaluation of welds examined are attached.

This summary completes the evaluation and documentation of the re-inspections performed on the three (3) identified girth welds on the WV-7A project in Gustine, CA.

Let me know should you require any additional information concerning these reviews and approvals.

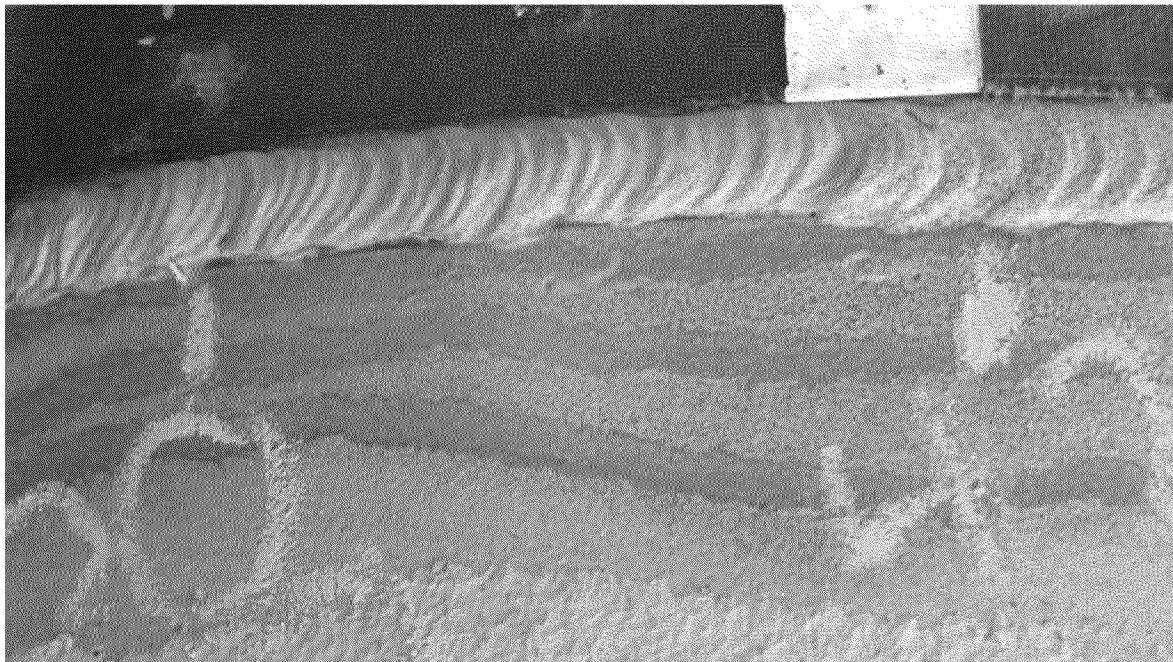
Respectfully,

Redacted

ASNT Level III – 2820  
ACCP Professional Level III



WV-7A - Weld T3-R1 (between ID markers 38-42)





Western Industrial X-Ray, Inc.  
 P.O. Box 238 Fairfield, CA  
 (707) 425-4673  
 (888) For X-Ray  
 info@wixinc.net  
 www.wixinc.net

Date 03/04/14 Page 1 Of 1  
 Radiographic Report or Control # RIG-E  
 Customer PGE  
 Address Redacted GUSTINE, CA  
 Customer's P.O. Number \_\_\_\_\_  
 Job Location 37° 5'46.17"N 121° 1'40.07"W WV-7  
 Job Number 42052019 LINE-331A / BD685  
 Item Description 20" GIRTH WELDS  
 100% Insp.  Spot Insp. \_\_\_\_\_ Percent \_\_\_\_\_

Nondestructive Inspection Report

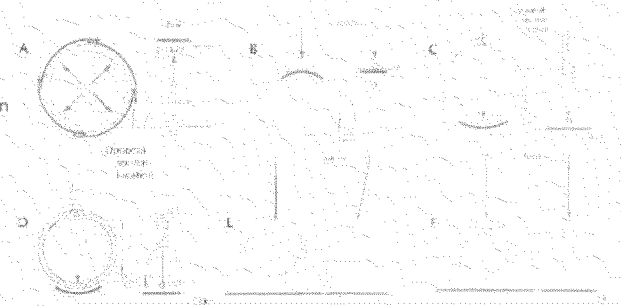
Piece or Joint #s	Weld Number	Film No.	A c c	R e j	Defect Code	Comments	Work Summary	
							Amount	Description
20" X .375 / .750	W-6-RI	3	✓				5 Travel Hours	2 # Persons
							0730 In Time	1330 Out Time
							6 Work Hours	
							0 Standby Hours	
							11 Total Hours	
							NA Per Diem	NA # Persons
							250 Mileage One Way	Round Trip <input checked="" type="checkbox"/>
20" X .375 / .500	TW-2-RI	3	✓				3 Weld 20 in. dia.	Weld _____ in. dia.
							Weld _____ in. dia.	Weld _____ in. dia.
							Weld _____ in. dia.	Weld _____ in. dia.
							9 Film 2.5" x 30" Type D4	
							Film _____ x _____ Type _____	
							Technique Date/Procedure Qualification	
20" X .500 / .500	TW-3-RI	3	✓		INDICATION		Inspection Specification	API 1104
					DETECTED ON FILM		Acceptance Standard	20TH
					FROM 38"-42"		RT Procedure No.	RT-7 Shooting Sketch (RSSS) <u>D</u>
					VERIFIED VISUALLY		View:	DWE SWV Source Ir192 Curies <u>70</u>
					DOES NOT EXCEED		Physical Source Size:	102/106 Effective Focal Spot: <u>147</u>
					1/32" IN DEPTH		Pb Screens: Front <u>.005</u> Center <u>FILM</u> Back <u>.005</u>	
							Dia. <u>20"</u> Material Type: <u>C/S</u> Thickness: <u>.375</u> Reinf: <u>.125</u>	
							SFD: <u>20"</u> Source To Obj.: <u>19.62"</u> IQI Essential Wire: <u>.013</u>	
							Exp. Time: <u>5</u> min. <u>0</u> sec. Dev. Time: <u>5</u> @ <u>70</u> deg.	
							Film Manufacturer: <u>AGFA</u> Speed: <u>D4</u> No. of Exp. <u>3</u> Film <u>3</u>	
							Geometric Unsharpness (Ug): <u>.002</u> Avg. Density: <u>2.3</u>	
							Dia. <u>20"</u> Material Type: <u>C/S</u> Thickness: <u>.500</u> Reinf: <u>.125</u>	
							SFD: <u>20"</u> Source To Obj.: <u>19.5"</u> IQI Essential Wire: <u>.016</u>	
							Exp. Time: <u>6</u> min. <u>0</u> sec. Dev. Time: <u>5</u> @ <u>70</u> deg.	
							Film Manufacturer: <u>AGFA</u> Speed: <u>D4</u> No. of Exp. <u>3</u> Film <u>3</u>	
							Geometric Unsharpness (Ug): <u>.003</u> Avg. Density: <u>2.7</u>	
							Dia. <u>20"</u> Material Type: <u>C/S</u> Thickness: <u>.750</u> Reinf: <u>.125</u>	
							SFD: <u>20"</u> Source To Obj.: <u>19.25"</u> IQI Essential Wire: <u>.020</u>	
							Exp. Time: <u>7</u> min. <u>0</u> sec. Dev. Time: <u>5</u> @ <u>70</u> deg.	
							Film Manufacturer: <u>AGFA</u> Speed: <u>D4</u> No. of Exp. <u>3</u> Film <u>3</u>	
							Geometric Unsharpness (Ug): <u>.005</u> Avg. Density: <u>3.0</u>	

Defect Code

- BT - Burn Through
- C - Crack
- CV - Root Concavity
- CX - Root Convexity
- DT - Drop Through
- ICP - Inadequate Cross Penetration
- IF - Incomplete Fusion
- IP - Incomplete Penetration
- PD - Inadequate Penetration Due to High-Low
- Ox - Oxidation
- P - Porosity
- SL - Slag Lines
- SI - Slag Inclusions
- UC - Undercut
- TI - Tungsten Inclusion

Redacted

Level II  
 Level I



The person signing this document represents that they have the authority to sign on the behalf of the customer. This report does not guaranty or warranty the condition of the materials tested. Western Industrial X-Ray, Inc. is not liable for any interpretation of results or losses attributable to any testing performed. There is no warranty for these services. Any liability is limited to the amount paid for the services in question. Final film interpretation is the responsibility of the customer.

Redacted

Date 03/04/14



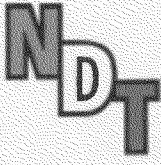
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# Appendix II

Approval of NDT Inspection personnel

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**Technical Services, Inc.**  
P. O. Box 721139, Houston, Texas 77272-1139

Cell: Redacted  
Ph: Redacted

Email: Redacted  
[www.ndttechnicalservices.com](http://www.ndttechnicalservices.com)

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March 3, 2014

Redacted

Pacific Gas and Electric Company  
PG&E Applied Technology Services  
3400 Crow Canyon Road  
San Ramon, CA 94583

Dear Redacted

As requested, in accordance with the approved PG&E Inspection Test Plan (ITP) for Reinspection of Girth Welds, on Tuesday, March 3, 2014, I performed a review of the qualification and certification documentation of additional NDT personnel to be utilized by Western Industrial X-Ray, Inc. (WIX). The qualification and certification of Redacted Redacted was verified and approval is hereby given for WIX to utilize Redacted to perform NDT in accordance with the approved ITP.

Let me know should you require any additional information concerning this review and approval.

Respectfully,

Redacted

ASNT Level III – 2820  
ACCP Professional Level III

DLC/Letter of Review & Approval of NDT Service Provider Level II Personnel – WIX 3-3-14.doc



# Western Industrial X-ray, Inc. (WIX)

1707 Enterprise Dr., Unit F, PO Box 238, Fairfield, CA 94533 (707)425-4673 FAX (707)425-4592 888 For Xray

## Training, Qualification & Certification

This is to certify that **Redacted** has successfully completed the following training and work experience qualifications of Western Industrial X-ray's "Nondestructive Training and Qualification Certification Program WIX-WP-1. He/She is qualified to perform inspection in the capacity as indicated. All training and testing was conducted to SNT-TC-1A, latest edition, for the specification at the level(s) indicated.

### Classroom Training:

Method	RT		MT		PT		UTT	VT-limited	
	I	II	I	II	I	II	II	I	II
Hours	80	80	16	24	8	16	48	8	

### Experience:

WESTERN INDUSTRIAL X-RAY, INC.	4/2008	PRESENT

### Test Scores:

METHOD	LEVEL	GENERAL	SPECIFIC	PRACTICAL	COMPOSITE	EXPIRES
RT	II	74.5	84	83	80	5/01/2016
MT	II	91	88	97	92.5	5/01/2016
PT	II	88	89	92	89.8	5/01/2016
UTT	II	89	92	98	93	5/01/2016
VT-LIMITED	II	95	97	100	97	5/01/2016
ACWI/CWI						N/A
RI						N/A
IRRSP/EQUIV.						N/A
AOC;NDT/RT						3/2014

### Eye Examination(s):

DATE OF EXAMINATION	RESULTS OF EYE EXAMINATIONS	PRESC. GLASSES REQUIRED	SHADES OF GREY	COLOR	EXAMINER
02/15/2011	THE CERTIFIED INDIVIDUAL IS CAPABLE OF READING JAEGER'S NO. 1 LETTERS AT A DISTANCE OF NOT LESS THAN 12 INCHES (30.5 CM) ON A STANDARD JAEGER'S TEST CHART.	NO	PASS	PASS	DR. BEACH
05/01/2013		NO	PASS	PASS	R.M. FINKENBINDER

CERTIFICATIONS APPROVED BY:

  
E. FINKENBINDER, CORP. LEVEL III

  
R.M. FINKENBINDER, PRES./CEO, RSO



**Western Industrial X-ray, Inc.**  
**VISION EXAMINATION PER JAEGER 1 OR EQUIVALENT**

**Near Vision Acuity:** This test shall show that the employee has near distance acuity in at least one eye so that the employee is capable of reading a minimum of Jaeger Number 1 or equivalent size and type letter at a distance of not less than 12 inches on a standard Jaeger test chart or, that the employee has the ability to perceive an Ortho-Rater minimum of 8 or similar test pattern.

Employee Name: Redacted

Test Method Administered: Jaeger 1   
Times New Roman 4.5   
Equivalent  (list) \_\_\_\_\_  
Ortho-Rater

Results: Acceptable  Natural   
Unacceptable  Corrected

**Color Contrast Differentiation:** This test must show that the employee has the ability to distinguish and differentiate colors that are used in the particular methods of nondestructive testing. Acceptable results are 8 of 8 pseudoisochromatic plates (Ishihara compatible) read correctly.

Employee has the ability to distinguish and differentiate colors: Yes  No

**Shades of Gray Contrast Differentiation:** This test must show that the employee has the ability to distinguish and differentiate shades of gray that are used in the particular methods of nondestructive testing. Acceptable results are a minimum of 20 out of 25 readings of the test chart developed by Dr. Kölbl of ONE/TÜV/BV or equivalent.

Employee has the ability to distinguish and differentiate shades of gray: Yes  No

Limitations / Comments: \_\_\_\_\_

**Declaration:** The vision examinations have been administered to this employee on this date and the results as given above are true and correct to the best of my knowledge.

Signature of Examiner: \_\_\_\_\_

Title of Examiner: R.M. Finkenbinder Date: \_\_\_\_\_

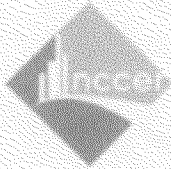
**Determination:** I, having the authority for Western Industrial X-ray, Inc., have reviewed this eye examination and concluded that this employee has successfully passed and is hereby considered visually qualified to work as a nondestructive testing technician.

Signature of authority: R.M. Finkenbinder Yes  No

Title of authority: R.M. Finkenbinder, Pres./RSO Date: 05/01/2013

Comments: R.M. Finkenbinder

# Score Report



Name: Redacted

Sponsor: Corey Delta Constructors

ID #: 572434792

Score: **82**

Answered: 50 out of 50

Test: **NDT: Radiographic Film Interpretation of Pipeline**

Date: 03/01/2011

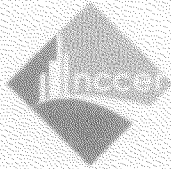
Test ID: 002549399

Result: **Pass**

Congratulations, you have passed this assessment. Your scores will automatically be reported to NCCER. If you met or exceeded the cut score on any covered task, your results will automatically be reported to ISNetworld. Below you will find a summary of your performance in each of the major subject areas.

Module	Subject Area	LOW	Cut Score	HIGH
62401-03	API Requirements (API 1104 Section 8)			
62401-03	Basic Radiographic Principles			
62401-03	Exposure Techniques			
62401-03	Radiation Safety			
62401-03	Film Processing			
62401-03	Radiographic Evaluation and Interpretation			

# Score Report



# ProV

Name	Redacted	Test	Abnormal Operating Conditions - Field
Sponsor	Corey Delta Constructors	Date	03/01/2011
ID#	572434792	Test ID	713541110
Score	<b>90</b>	Result:	<b>Pass</b>
Answered	40 out of 40		

Congratulations, you have passed this assessment. Your scores will automatically be reported to NCCER.

If you met or exceeded the cut score on any covered task, your results will automatically be reported to ISNetwork.

Below you will find a summary of your performance in each of the major subject areas.

Module	Subject Area	LOW	Cut Score	HGH
66102 67107	Abnormal Operating Conditions - Field Operations (Liquid and Gas)			