

# ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **608598**

Proj.  
ECN

<b>2. ECN Category (mark one)</b> Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	<b>3. Originator's Name, Organization, MSIN, and Telephone No.</b> DG Spurling, IRM/ISS/C&WMSS, R1-01, 3-2969		<b>4. Date</b> 8/29/94
	<b>5. Project Title/No./Work Order No.</b> TMACS/N46G1	<b>6. Bldg./Sys./Fac. No.</b> 2750E/TMACS/200E	<b>7. Impact Level</b> Q
	<b>8. Document Numbers Changed by this ECN</b> (includes sheet no. and rev.) WHC-SD-WM-TRP-105, Rev 65 WHC-SD-WM-TRP-106, Rev 65 WHC-SD-WM-TRP-107, Rev 65 WHC-SD-WM-TRP-109, Rev 54 WHC-SD-WM-TRP-113, Rev 54 WHC-SD-WM-TRP-114, Rev 65	<b>9. Related ECN No(s).</b> ECN 196863 EDT 159986 EDT 600611 EDT 196862	<b>10. Related PO No.</b>
<b>11a. Modification Work</b> <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	<b>11b. Work Package No.</b> N46G1	<b>11c. Modification Work Complete</b> N/A _____ Cog. Engineer Signature & Date	<b>11d. Restored to Original Condition (Temp. or Standby ECN only)</b> N/A _____ Cog. Engineer Signature & Date
<b>12. Description of Change</b> Four Tank Farm Surveillance System (TFSS) Change Requests were incorporated into TMACS Software Release 4.1. These include AN Farm sensor addition (temperature, pressure), C-106 instrument install (Enraf, pressure), Enraf installs (C-103, BX-106, T-102, T-107) and enhancements to the Acromag software driver.  The results of this software test are documented in each Test Report, and summarized in Test Procedure 10 (WHC-SD-WM-TRP-114).			
<b>13a. Justification (mark one)</b> Criteria Change <input checked="" type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>			
<b>13b. Justification Details</b> TMACS software development and release guidelines are governed under WHC-IP-0842, Section 12.2, Tank Farm Surveillance System Configuration Control Board, and WHC-SD-WM-CSCM-019, TMACS Software Configuration Management Plan			
<b>14. Distribution (include name, MSIN, and no. of copies)</b> See Distribution Sheet		RELEASE STAMP OFFICIAL RELEASE BY WHC DATE <b>SEP 01 1994</b> STA 4	

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ENGINEERING CHANGE NOTICE				Page 2 of 2	1. ECN (use no. from pg. 1) 608598																																																																				
<b>15. Design Verification Required</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>16. Cost Impact</b> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">ENGINEERING</td> <td style="width: 50%; text-align: center;">CONSTRUCTION</td> </tr> <tr> <td>Additional <input type="checkbox"/> \$</td> <td>Additional <input type="checkbox"/> \$</td> </tr> <tr> <td>Savings <input type="checkbox"/> \$</td> <td>Savings <input type="checkbox"/> \$</td> </tr> </table>			ENGINEERING	CONSTRUCTION	Additional <input type="checkbox"/> \$	Additional <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$	<b>17. Schedule Impact (days)</b> Improvement <input type="checkbox"/> Delay <input type="checkbox"/>																																																															
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<b>18. Change Impact Review:</b> Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.																																																																									
SDD/DD <input type="checkbox"/> Functional Design Criteria <input type="checkbox"/> Operating Specification <input type="checkbox"/> Criticality Specification <input type="checkbox"/> Conceptual Design Report <input type="checkbox"/> Equipment Spec. <input type="checkbox"/> Const. Spec. <input type="checkbox"/> Procurement Spec. <input type="checkbox"/> Vendor Information <input type="checkbox"/> OM Manual <input type="checkbox"/> FSAR/SAR <input type="checkbox"/> Safety Equipment List <input type="checkbox"/> Radiation Work Permit <input type="checkbox"/> Environmental Impact Statement <input type="checkbox"/> Environmental Report <input type="checkbox"/> Environmental Permit <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/> Stress/Design Report <input type="checkbox"/> Interface Control Drawing <input type="checkbox"/> Calibration Procedure <input type="checkbox"/> Installation Procedure <input type="checkbox"/> Maintenance Procedure <input type="checkbox"/> Engineering Procedure <input type="checkbox"/> Operating Instruction <input type="checkbox"/> Operating Procedure <input type="checkbox"/> Operational Safety Requirement <input type="checkbox"/> IEFD Drawing <input type="checkbox"/> Cell Arrangement Drawing <input type="checkbox"/> Essential Material Specification <input type="checkbox"/> Fac. Proc. Samp. Schedule <input type="checkbox"/> Inspection Plan <input type="checkbox"/> Inventory Adjustment Request <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/> Health Physics Procedure <input type="checkbox"/> Spares Multiple Unit Listing <input type="checkbox"/> Test Procedures/Specification <input type="checkbox"/> Component Index <input type="checkbox"/> ASME Coded Item <input type="checkbox"/> Human Factor Consideration <input type="checkbox"/> Computer Software <input checked="" type="checkbox"/> Electric Circuit Schedule <input type="checkbox"/> ICRS Procedure <input type="checkbox"/> Process Control Manual/Plan <input type="checkbox"/> Process Flow Chart <input type="checkbox"/> Purchase Requisition <input type="checkbox"/>																																																																							
<b>19. Other Affected Documents:</b> (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.																																																																									
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<b>20. Approvals</b> <table style="width:100%; border: none;"> <thead> <tr> <th style="width: 45%;">Signature</th> <th style="width: 10%;">Date</th> <th style="width: 20%;">Signature</th> <th style="width: 25%;">Date</th> </tr> </thead> <tbody> <tr> <td colspan="4"><b>OPERATIONS AND ENGINEERING</b></td> </tr> <tr> <td>Cog Engineer [DA Barnes] <i>David Barnes</i></td> <td>8/31/94</td> <td>ARCHITECT-ENGINEER</td> <td></td> </tr> <tr> <td>Cog. Mgr. [JS Schofield] <i>John Schofield</i></td> <td>8/31/94</td> <td>PE</td> <td></td> </tr> <tr> <td>QA [JA Warren] <i>James A Warren</i></td> <td>08/31/94</td> <td>QA</td> <td></td> </tr> <tr> <td>Safety</td> <td>N/A</td> <td>Safety</td> <td></td> </tr> <tr> <td>Security</td> <td>N/A</td> <td>Design</td> <td></td> </tr> <tr> <td>Environ.</td> <td>N/A</td> <td>Environ.</td> <td></td> </tr> <tr> <td>Projects/Programs</td> <td>N/A</td> <td>Other</td> <td></td> </tr> <tr> <td>Tank Waste Remediation System</td> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td>Facilities Operations [TW Bohan] <i>TW Bohan</i></td> <td>8/31/94</td> <td>DEPARTMENT OF ENERGY</td> <td>N/A</td> </tr> <tr> <td>Restoration &amp; Remediation</td> <td>N/A</td> <td>Signature or Letter No.</td> <td></td> </tr> <tr> <td>Operations &amp; Support Services</td> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td>IRM/ISS/C&amp;WMSS [RB Bass] <i>RB Bass</i></td> <td>8/31/94</td> <td>ADDITIONAL</td> <td>N/A</td> </tr> <tr> <td>IRM/ISS/C&amp;WMSS [DG Spurling] <i>Dave Spurling</i></td> <td>8/30/94</td> <td></td> <td></td> </tr> <tr> <td>Other</td> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td></td> <td>N/A</td> <td></td> <td></td> </tr> </tbody> </table>						Signature	Date	Signature	Date	<b>OPERATIONS AND ENGINEERING</b>				Cog Engineer [DA Barnes] <i>David Barnes</i>	8/31/94	ARCHITECT-ENGINEER		Cog. Mgr. [JS Schofield] <i>John Schofield</i>	8/31/94	PE		QA [JA Warren] <i>James A Warren</i>	08/31/94	QA		Safety	N/A	Safety		Security	N/A	Design		Environ.	N/A	Environ.		Projects/Programs	N/A	Other		Tank Waste Remediation System	N/A			Facilities Operations [TW Bohan] <i>TW Bohan</i>	8/31/94	DEPARTMENT OF ENERGY	N/A	Restoration & Remediation	N/A	Signature or Letter No.		Operations & Support Services	N/A			IRM/ISS/C&WMSS [RB Bass] <i>RB Bass</i>	8/31/94	ADDITIONAL	N/A	IRM/ISS/C&WMSS [DG Spurling] <i>Dave Spurling</i>	8/30/94			Other	N/A				N/A		
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**RELEASE AUTHORIZATION**

**Document Number:** WHC-SD-WM-TRP-114, REV 6

**Document Title:** TMACS TEST PROCEDURE TP010: INTEGRATION SUMMARY

**Release Date:** 9/1/94

\* \* \* \* \*

**This document was reviewed following the  
procedures described in WHC-CM-3-4 and is:**

**APPROVED FOR PUBLIC RELEASE**

\* \* \* \* \*

**WHC Information Release Administration Specialist:**



Kara Broz

(Signature)

9/1/94

(Date)

<b>SUPPORTING DOCUMENT</b>		1. Total Pages 7	
2. Title TMACS Test Procedure TP010: Integration Summary		3. Number WHC-SD-WM-TRP-114	4. Rev No. 6
5. Key Words Software, Test Procedure, Tank Monitor and Control System, TMACS Software Project  <b>APPROVED FOR PUBLIC RELEASE</b>  <i>KMB 9/1/94</i>		6. Author Name: D. G. Spurling <i>Dave Spurling</i> Signature Organization/Charge Code 62610/N46G1	
7. Abstract The TMACS Software Project Test Procedures translate the project's acceptance criteria into test steps. Software releases are certified when the affected Test Procedures are successfully performed and the customers authorize installation of these changes.  This Test Procedure tests the TMACS Integration Summary.			
8. <del>PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.</del>  <del>PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.</del>		10. RELEASE STAMP  OFFICIAL RELEASE BY WHC DATE SEP 01 1994 <i>STA 4</i>	
9. Impact Level Q			

**MASTER**

RECORD OF REVISION

(1) Document Number

WHC-SD-WM-TRP-114

Page 1

(2) Title  
Tank Monitor And Control System (TMACS) Software Project, Release 4.1  
Test Procedure TP010, Integration Summary

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cog. Engr.	(6) Cog. Mgr.	Date
0	(7) Software Release 0.0 Release Testing Released under EDT 159986, 10/15/92			
1	Software Release 1.0 Release Testing Released under ECN 196866, 1/31/93			
2	Software Release 1.1 Release Testing Released under ECN 196865, 4/30/93			
3	Software Release 2.0 Release Testing Released under ECN 196864, 10/1/93			
4	Software Release 3.0 Release Testing Released under ECN 196863, 1/15/94			
5	Software Release 4.0 Release Testing Released under ECN 196862, 5/31/94			
6 RS	Software Release 4.1 Release Testing Released under ECN 608598, 8/29/94	<i>[Signature]</i> 8/31/94	<i>[Signature]</i>	8/31/94

**TANK MONITOR AND CONTROL SYSTEM**

**(TMACS) SOFTWARE PROJECT**

**Release 4.1**

**TEST PROCEDURE TP010:**

**INTEGRATION SUMMARY**

**David G. Spurling**

**IRM Chemical & Waste Management  
Software Support**

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August 25, 1994

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## 1.0 TEST ITEMS

This Test Procedure verifies that Test Procedures 1, 2, 3, 5 and 9 (WHC-SD-WM-TRP-105, 106, 107, 109 and 113) of TMACS Software Release 4.1 have been successfully completed. This release supersedes the previous release, and is performed according to WHC-SD-WM-CSCM-019, "TMACS Software Configuration Management Plan".

The following Test Procedures are provided for in WHC-SD-WM-TP-148, "Tank Monitor And Control System (TMACS) Software Upgrade Test Plan":

- TP001: Alarm Management (WHC-SD-WM-TRP-105)
- TP002: Trending (WHC-SD-WM-TRP-106)
- TP003: Graphics (WHC-SD-WM-TRP-107)
- TP004: Reporting (WHC-SD-WM-TRP-108)
- TP005: Sensor Configuration, Logging, and Data Conversion (WHC-SD-WM-TRP-109)
- TP006: Performance (WHC-SD-WM-TRP-110)
- TP007: System Admin/Security (WHC-SD-WM-TRP-111)
- TP008: SACS Interface (WHC-SD-WM-TRP-112)
- TP009: Acromag Driver (WHC-SD-WM-TRP-113)
- TP010: Integration Summary (WHC-SD-WM-TRP-114)

The Test Plan is currently being revised to rename Test Case documents as Test Procedures, from recommendations from WHC Software QA, and to add the following Test Procedures added in this release:

- TP011: TMACS Panalarm Interface (WHC-SD-WM-TRP-201)
- TP012: Panalarm Software Bridge (WHC-SD-WM-TRP-202)

## 2.0 ACCEPTANCE CRITERIA AND REQUIREMENTS

The original Acceptance Criteria for the TMACS Software Upgrade Project were agreed to by the customer and the cognizant engineer on 6/30/92. They are compiled from WHC-SD-WM-SFR-006, "Tank Monitor And Control System (TMACS) System Functional Requirements", and are attached to WHC-SD-WM-TP-148, "Tank Monitor And Control System (TMACS) Software Upgrade Test Plan", Appendix G.

The acceptance criteria for this Test Procedure are to verify that all of the Test Procedures are complete, and consequently, that the delivered system is complete. This will be verified by visual review of each of the Test Procedure Acceptance Sheets.

### 2.1 Summary of Test Changes for TMACS Release 4.1

The following Change Requests were added in Software Release 4.1. These are documented in each of the related Test Cases and the Change Requests will be incorporated into WHC-SD-WM-SFR-006, TMACS Software Functional Requirements.



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- 94-017 Modify the Acromag communications software to improve performance:  
1) 1 retry for communication failure;  
2) No retry if station is down
- 94-027 Provide software connection to Acromag stations at AN Tank Farm. (Note: Tank Farm Operations disallowed TMACS monitoring of structural TCs until operational requirements are identified.)
- 94-031 Add automatic Enraf Levels in BX-106, C-103, T-102, T-107.
- 94-034 Add Enraf level sensor, two pressure sensors to C-106.

## 2.2 Summary of Test Exceptions and Resolutions

The following summary has been paraphrased from each of the Test Procedure Exception Sheets and does not include errors caused by improper wording in the test steps.

- TP001: Alarm message "Limit Exceeded" was displayed when limit was met (before actually exceeded). Recommend rewriting error message. **Resolution: User recognizes the potential confusion, but does not want the message changed.**
- TP002: (none)
- TP003: (none)
- TP005: (none)
- TP009: (none)

## 2.3 Test Report

TMACS testing was performed August 24-26, 1994. Participating in the test were WHC Software QA, TMACS/SACS Software Engineering, Tank Farms Operations, and WHC Shift And Surveillance Engineering. Since this was a minor release, only following Test Procedures were performed:

- TP001, Sections 5.1, 5.3 - 5.9, 5.14
- TP002 (all)
- TP003, Sections 5.1.1 - 5.1.17
- TP005, Sections 5.1, 5.2
- TP009 (all)

The following alarm set points for newly connected instruments were approved by the cognizant engineer:

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Pressure sensors:

- \* P1 sensors (instrument range: -4 to +1") were set to -4" (inches water, gauge) low and -0.25" high, per the current OSD.
- \* P2 sensors (range: -10 to +80") were set to -6" low and +5" high, which are the OSD maximum limits. (Note: the purpose of these sensors is to record any values that might exceed the P1 sensor detection capabilities.)
- \* Sensor delta band (minimum sensor accuracy) was set to 0.01" for P1 sensors, and 0.1" for P2 sensors.

Temperature sensors: AN Farm

AN temperature connections were field tested to within 10 degrees Fahrenheit of local field readings. Because of the potential variation, the cognizant engineer requested that two or three weeks be spent gathering trend data from which meaningful limits could be set. In the interim, the following limits were approved (in degrees Fahrenheit):

101-AN:	50 Low,	100 High
102-AN:	50 Low,	118 High
103-AN:	50 Low,	137 High
104-AN:	50 Low,	146 High
105-AN:	50 Low,	130 High
106-AN:	50 Low,	100 High
107-AN:	50 Low,	119 High

All Test Procedures selected for this release were completed and approved by August 26 with no unresolved test exceptions. As previously mentioned, AN Farm structural TCs were not configured into this release at the request of Tank Farm Operations. Also, software testing was completed prior to field installation for the C-106 Enraf level detector and two pressure sensors, and the C-103 Enraf level detector. The testing results were communicated to the cognizant engineer's manager, who approved the final installation.

TMACS Software Release 4.1 was certified on the production workstations on August 26, 1994. No outstanding Problem Reports were generated from this test.

**3.0 TESTER INFORMATION**

This Test Procedure serves as a validation review, and requires only a minimum of test personnel. This will be performed by the Software Project Manager (Tester) and the TMACS cognizant engineer (Witness).

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**4.0 PRE-TEST INSPECTION AND SETUP REQUIREMENTS**

This test cannot be performed until TMACS Test Procedures 1, 2, 3, 5 and 9 have been completed and resolved.

**5.0 TEST STEPS WITH EXPECTED RESULTS**

STEP	DESCRIPTION	VERIFY
5.1	Verify the TP001 Acceptance Sheet has been signed off.	DB
5.2	Verify the TP002 Acceptance Sheet has been signed off.	DB
5.3	Verify the TP003 Acceptance Sheet has been signed off.	DB
5.5	Verify the TP005 Acceptance Sheet has been signed off.	DB
5.9	Verify the TP009 Acceptance Sheet has been signed off.	DB
5.10	Release 4.1 installation concurrence	DB

DA Barnes, TMACS Cognizant Engineer *David Barnes* DB 8/31/94  
 Witness / Organization Initials Date

DG Spurling, TMACS Software Project Manager *Dave Spurling* DS 8/31/94  
 Initials Date

**6.0 REFERENCES**

- WHC-SD-WM-TRP-105, Rev 6 TP001: Alarm Management
- WHC-SD-WM-TRP-106, Rev 6 TP002: Trending
- WHC-SD-WM-TRP-107, Rev 6 TP003: Graphics
- WHC-SD-WM-TRP-108, Rev 4 TP004: Reporting
- WHC-SD-WM-TRP-109, Rev 5 TP005: Sensor Configuration, Logging, and Data Conversion
- WHC-SD-WM-TRP-110, Rev 0 TP006: Performance (not released)
- WHC-SD-WM-TRP-111, Rev 5 TP007: System Admin/Security
- WHC-SD-WM-TRP-112, Rev 5 TP008: SACS Interface
- WHC-SD-WM-TRP-113, Rev 5 TP009: Acromag Driver
- WHC-SD-WM-TRP-201, Rev 0 TP011: TMACS Panalarm Interface
- WHC-SD-WM-TRP-202, Rev 0 TP012: Panalarm Software Bridge
  
- WHC-SD-WM-TP-148, Rev 0 TMACS Software Test Plan
- WHC-SD-WM-CSCM-019, Rev 0 TMACS Software Configuration Management Plan
- WHC-SD-WM-SFR-006, Rev 0 TMACS System Functional Requirements