The attached document "RPP-4789, RPP CASS to TMACS Transfer Project Plan" is issued for release and effective as of July 2, 1999.
RPP Computer Automated Surveillance System (CASS) to Tank Monitor and Control System (TMACS) Transfer Project Plan

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U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 627467  UC: 2000
Org Code: 79800  Charge Code: 102620/BC30
B&R Code: EW02J1180 Total Pages: 21

Key Words: CASS, TMACS, Tank, Monitor, Alarm, Control, Plan

Abstract: Management plan to ensure the orderly, systematic transfer of alarms from the retired Computer Automated Surveillance System (CASS) to the Tank Monitor and Control System (TMACS).
River Protection Project
Computer Automated Surveillance System (CASS)
To
Tank Monitor and Control System (TMACS)
Transfer Project Plan

RPP-4789
Approval Designator: NA

Rev. 0
July 2, 1999

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Approved By: C. E. Shipler, Manager, RPP Operational Configuration Management

Lockheed Martin Hanford Company
Richland, Washington
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1.0 BACKGROUND

There are two primary monitoring and control systems used within the River Protection Project (RPP) to monitor facilities. The systems are Computer Automated Surveillance System (CASS), and Tank Monitor and Control System (TMACS). CASS was officially retired on February 25, 1999. Both systems are described in the Basis For Interim Operation (BIO), Appendix B, Facility and Process Description. The BIO states that TMACS shall eventually replace CASS. There have been several proposals submitted over the past few years recommending CASS be decommissioned and all its functionality be moved to the TMACS platform.

CASS, as described in the BIO Section B2.4.11.1, was designed to provide central, computerized surveillance of the waste storage tanks and their associated facilities. CASS consisted of six remote computers that monitored alarms, raw water usage, leak detectors, CAMs, Stacks, microcomputer, pressures, and liquid levels. The remote computers communicated with the Central Surveillance Computer (CSC) located in Building 2750E in the 200E Area. CASS provided no controls, interlocks, or automatic action based on the signals it received. An operator at the central CASS/TMACS Facility, manned on a 24-hour basis, monitored the system and advised field operators of any alarm conditions. The CASS was developed in a closed architecture that was a costly, proprietary dependency for RPP. The system was maintained beyond its life expectancy causing the hardware and software to become old and obsolete technology. This made it very difficult and costly to maintain, in some cases, forcing RPP to raid old computer graveyards to keep it running. Additionally, the CASS Data General computers were not Y2K compliant. An Unreviewed Safety Question (USQ) Screening and Determination determined that CASS could be removed from service since alternative monitoring means (manual monitoring and data entry) were available to meet surveillance requirements. A safety question raised following retirement of the system resulted in the creation and development of a PC-based system to support the interim monitoring of CASS alarm points until the migration to TMACS can be accomplished.

TMACS, first installed in portions of BY Farm in 1991, was designed for continuous monitoring of tank temperature. It was subsequently expanded to monitor additional tank farm temperatures, hydrogen, level, and pressure signals. TMACS is designed in an open-ended architecture software (G2) that makes it very capable of supporting the additional alarms migrated from CASS and versatile enough to handle any future interfaces that RPP may require for upcoming projects.

This plan provides a methodology for transitioning "essential" CASS monitored functions to TMACS and deactivating "non-essential" alarms in accordance with the RPP Alarm Management Plan.

Additional information is supplied in the following supporting documents:


2) Unreviewed Safety Question Tracking No. TF-98-0829 Rev. 0, Remove Computer Automated Surveillance System (CASS) from Operation
2.0 PURPOSE
The RPP CASS to TMACS Transfer Project Plan establishes the systematic control process required for managing and maintaining the safe, efficient, and environmentally sound operation of alarms considered essential. This plan defines a rigorous verification and evaluation of the existing system configuration. The plan then provides for corrective actions, where required, to restore system functionality for integration with other tank farm alarm activities. This plan is designed to improve operator awareness and response to those alarms that are determined to be “essential” by using the RPP Alarm Management Plan in conjunction with RPP CASS to TMACS Transfer Project.

3.0 SCOPE
The project shall provide a baseline status and analysis of all existing CASS alarms; the development of a controlled process for the resolution of CASS alarm issues; and the integration of existing operational system alarm requirements with future projects.

The project shall identify and assure the functionality of essential CASS alarms and deactivate non-essential alarms. This objective will be accomplished through a series of field verifications, review of system history documents, engineering evaluations, and the generation and execution of work documents to transfer essential alarms from CASS to TMACS. One central and thirteen (13) substation monitoring locations are involved in the transfer of CASS alarms.

Additionally, software and hardware will be designed to replace the outdated CASS equipment with equipment compatible with TMACS. The former CASS alarm points will be incorporated into TMACS and maintained as part of that system.

The project assumes that all essential alarms will be transferred from CASS to TMACS. It should be noted that concurrent and future projects, such as the Master Pump Shutdown and Waste Feed Delivery Systems, might want to utilize these alarms. These projects shall be given the opportunity to review the alarms being transferred. The project needs and comments will be tracked on the Master Alarm Status (MAS) sheets as part of the RPP Alarm Management Plan.

4.0 SCHEDULE AND MILESTONES
Detailed schedule objectives for the project are shown in Attachment 1, RPP CASS to TMACS Transfer Project Schedule. Based on the defined scope of one central and thirteen (13) substation monitoring locations, the project as scheduled in Attachment 1 will result in achievement of the following established project milestones:

- 2750E Software Design 01/31/2000
- 2750E software Installation 04/21/2000
- Substation C essential alarms transferred to TMACS 04/28/2000
- Substation A essential alarms transferred to TMACS 08/31/2000
- Substation B & S essential alarms transferred to TMACS 01/31/2001
- Substation T & U essential alarms transferred to TMACS 03/30/2001
Assumption(s):

- The determination of whether an alarm is essential or non-essential is conducted in accordance with the RPP Alarm Management Program. It assumes that the determination of essential and non-essential alarms is completed within 20 working days of submittal. Historically, based on the RPP Alarm Management Plan experience, Operations and Engineering reviews are taking considerable time (>30 working days). If these reviews are not completed in a timely manner, the schedule will be seriously impacted.

- Software design has been estimated to require only four (4) weeks. The CASS alarm additions to TMACS require more up-front programming to maintain an open flexible architecture. New “object oriented” programming will be required to allow the integration of both systems. Software design delays will seriously impact the schedule.

- U.S. West will be able to supply all necessary communications equipment and service as required to support project installations.

5.0 COST ESTIMATES

The retirement and transition project has an estimated cost of $1,258,300 encompassing all phases of the project. The project and cost is distributed over two (2) fiscal years as follows:

Fiscal year 2000 - $857,270
Fiscal year 2001 - $401,030

A detailed cost breakdown is provided as Attachment 2, CASS to TMACS Transfer Project Cost Loading Report.

Assumption(s):

- The cost estimate does not take into account the repair or replacement of non-functioning sensors or detectors. These costs will be determined following the determination of the essential alarms to be transferred and verification of the functionality of these alarms.

- The cost estimate is based on HNF-SD-WM-WP-344, CASS Retirement Plan, May 15, 1997. This addendum revised the costs to reflect 1999 labor cost codes and equipment costs. Based on the 1997 plan, it is estimated that 466 (out of 675) alarms shall be transferred. The cost estimate for equipment may vary depending upon the final number of alarms determined to be essential by OCM, Operations, and Engineering.

- The cost of U.S. West telephone service and equipment has not been included in the cost estimate. Currently, U.S. West charges $66.90 per service installation (provided lines are available) and $26.25 per month for each additional line. The number of additional circuits required will be determined during the detailed design phase, following identification of the essential alarms.
Determination of equipment (i.e. Acromag boards) or alarms as safety significant may impact the schedule. Cost estimates are based upon reaching a non-safety significant determination.

The cost estimate is based upon a design for Acromag conversion, which is a known product. The Panalarm equipment is of an unknown design and may impact schedule in terms of redesign of the Acromag conversion.

6.0 PROJECT DESCRIPTION

The project shall evaluate existing CASS alarms; perform field alarm verification; identify essential and non-essential alarms; repair essential alarm sensors or detectors as required; modify and update panels and equipment; and deactivate the non-essential alarms at the following facilities/locations in the RPP complex:

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<tr>
<th>Substation</th>
<th>Building</th>
<th>Alarms To Evaluate</th>
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<td><strong>Total</strong></td>
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Software must be developed in parallel with the hardware design to allow for the incorporation of human factor elements into the display and control system.

6.1 Essential/Non-Essential Alarm Determination

OCM, Operations, and Engineering shall determine essential and non-essential CASS alarms that shall either be transferred to TMACS or disabled. This review will be accomplished in conjunction with RPP Alarm Management Plan (TWR3-3763), Unreviewed Safety Question Tracking No. TF-98-0829, and documented on the MAS sheets.
6.2 Non-Essential Alarm Disposition

OCM shall perform or ensure performance of the following steps for non-essential alarm disposition.

1. Prepare the following documents
   a. Engineering Change Notices to deactivate non-essential alarm inputs.
   b. Unreviewed Safety Question Screenings for ECNs per HNF-IP-0842.
   c. Procedure Change Authorization for each affected procedure.

2. Develop a Work Package for deactivating non-essential alarms.

3. Label non-essential alarms as inactive.

4. Update affected procedures.

5. Deactivate non-essential alarms.

6.3 Essential Alarm Hardware Design/Installation

Design of hardware and software to interface existing CASS sensor and detector equipment with TMACS should be performed in parallel.

Hardware design/installation includes the following:

1. Prepare Field Verification Package.

2. Perform Field Verification and Functional checks.

3. Prepare the following documents.
   a. Engineering Change Notices to capture configuration changes.
   b. Unreviewed Safety Question Screenings for ECNs per HNF-IP-0842.
   c. Procedure Change Authorization for each affected procedure.

4. Procure required hardware.

5. Develop Work Package to install hardware.

6. Install Hardware.

7. Develop ATP to test affected equipment.

8. After software OTP is performed, perform end to end ATP/OTP on affected equipment.
6.4 Essential Alarm Software Design/Installation

Design of hardware and software to interface existing CASS sensor and detector equipment with TMACS should be performed in parallel.

Software design/installation includes the following:

1. Develop TMACS software.
2. Develop Tank Constructor software.
3. Prepare ECN/USQ/PCA.
4. Perform ATP on Development Server.
5. Develop Work Package.
6. Install software on Production Server.
7. Perform OTP on Production Server to verify system changes have not affected system operation.
8. Update/Generate Taglist.

Note: The Taglist is a hardware-to-software address database that links discrete computer data points to specific sensors and detectors. It ensures sensor information is properly routed between the software operating and database systems and the sensor.

9. Update affected procedures.

6.5 Closeout Requirements

1. Close Work Packages
2. Incorporate ECN information and update MAS sheets to reflect current status.
3. Release system to operational status.
5. Perform operator training, as required.
7.0 REQUIREMENTS

- A CASS to TMACS transfer project plan shall be developed to provide tools and processes for the field verification, design and installation of equipment and software, and the transfer of CASS alarms to TMACS.

- Provide human factors engineered software that meets Conduct of Operations requirements. Develop additional screen displays that are consistent with the current tank-oriented displays but reflect alarms that are substation or location specific. It is important to note that these additions to TMACS require more up-front programming to maintain an open flexible architecture.

8.0 RESPONSIBILITIES

Project responsibilities shall be in accordance with the RPP Alarm Management Plan, TWRS-3763, Section 8.0.

9.0 REPORTING REQUIREMENTS

Project reporting requirements shall be in accordance with the RPP Alarm Management Plan, TWRS-3763, Section 9.0.

10.0 ATTACHMENTS

Attachment 1, RPP CASS to TMACS Transfer Project Schedule
Attachment 2, RPP CASS to TMACS Transfer Project Cost Loading Report
Attachment 3, RPP CASS to TMACS Transfer Project Process Flowchart
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RPP CASS TO TMACS TRANSFER PROJECT
6/23/99 Baseline

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**REPORT DATE 24JUN99 RUN NO. 303**

**RPP CASS to TMACS Transfer Project (Baseline)**

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<td>4.87</td>
<td></td>
</tr>
<tr>
<td>19CASU6</td>
<td>U-271 - Deactivate Non-Ess CASS Alarms</td>
<td>13.84</td>
<td>13.84</td>
<td></td>
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<tr>
<td>TOTAL</td>
<td>UU</td>
<td>6.27</td>
<td>88.50</td>
<td>74.77</td>
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**REPORT TOTAL**

|       |       | 667.27  | 401.03  | 1268.3 |