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MAR 31 1993

93-OB-051

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Mr. Paul T. Day
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U. S. Environmental Protection Agency
Region 10
712 Swift Boulevard, Suite 5
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Dear Messrs. Jansen and Day:

STATUS REPORT ON CORRECTIVE ACTIONS FOR SINGLE-SHELL TANK 241-T-101

Reference: Letter; S. H. Wisness, RL, to P. T. Day, EPA, and D. B. Jansen, Ecology, "Hanford Facility Agreement and Consent Order (Tri-Party Agreement) Change Request Form M-05-92-05, Compliance Issues with Single-Shell Tank (SST) 241-T-101," dated December 18, 1992. 25777

In the referenced letter, the U.S. Department of Energy, Richland Field Office, (RL) committed to several new Tri-Party Agreement milestones concerning Single-Shell Tank 241-T-101. RL is proceeding to complete these milestones. One of these milestones was:

> Milestone M-05-15B: The USDOE-RL shall provide to Environmental Protection Agency and State of Washington Department of Ecology a letter report on in-tank liquid level detection options available for tank T-101 consistent with the requirements of Chapter 173-303 WAC. This letter report shall be provided by March 31, 1993. If the liquid level remains in this tank, an accelerated implementation schedule for the installation of the preferred option for in-tank liquid level detection shall be provided within sixty (60) days of this milestone due date.

Enclosed with this letter, please find copies of "Level Detection Option R report for Tank 241-T-101," dated March 25, 1993. This report fulfills the requirement of this milestone. Since the liquid in Tank 241-T-101 is in the process of being removed, the secondary requirement of interim milestone M-05-15B, provide an accelerated schedule for installing the preferred option into the tank, is no longer required.

RL would welcome any comments you may have on this report's content. RL intends to discuss this report at a Tri-Party Agreement Unit Manager's Meeting in the future.

This completes action on this milestone.

If you have any questions, please contact me on (509) 376-6798, or Mr. G. E. Bishop on (509) 372-1856.

Sincerely,

K. Michael Thompson for

Steven H. Wisness,
Hanford Project Manager

TWS:GEB

Enclosure

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Enclosure

Level Detection Option Report

for

Tank 241-T-101

LEVEL DETECTION OPTION REPORT

FOR

TANK 241-T-101

Prepared by

Instrument and Control Engineering

March 25, 1993

TABLE OF CONTENTS

1.0 INTRODUCTION

This document details the constraints on the design of a level detection system for tank 241-T-101 (101-T) and recommends an instrument based on previous testing and analysis. The existing level detection instrument, the Food Industries Corporation (FIC) conductivity gage, continues to have maintenance problems. Tank 101-T has its level detection system designated Safety Class 1 (SC-1). This puts constraints on the design of a replacement system for the FIC gage. These constraints are discussed in Section 3.0. A brief summary of the testing to identify an FIC replacement gage is discussed in Section 4.0. The recommended level detection system is discussed in Section 5.0 including a discussion of the constraints and how they were addressed.

2.0 EXECUTIVE SUMMARY

The recommendation is in two parts. The first recommendation is to be used if tank 101-T has not been pumped (i.e. has a liquid surface). The second recommendation is to be used if tank 101-T has been pumped (i.e. has a sludge level and an interstitial liquid level).

The first recommendation is to replace the existing FIC gage installed in riser number 1 of tank 101-T with an Enraf-Nonius Series 854 Advanced Technology Gauge (854 ATG) level detector. The 854 ATG uses a displacer suspended by a wire. The gage monitors the tension in the wire. As the displacer contacts the surface, the wire tension changes and the level is detected. To provide redundancy, the manual tape installed in riser number 7 is left in place. The Washington State Administrative Code requires the reporting of leaks of one pound of material. The recommended gage will detect leaks of 110 gallons. This is the best available technology. For a more thorough discussion of the recommendation, see section 5.0.

The second recommendation is to install a liquid observation well (LOW) in 101-T. The LOW would be used to first baseline and then track the interstitial liquid level in the tank.

3.0 DESIGN CONSTRAINTS

This section discusses the design constraints imposed on the level detection system by the Department of Energy (DOE) Order 6430.1A, "General Design Criteria," since the system has been declared a SC-1 system. Criteria are stated with the section number from DOE Order 6430.1A (e.g. 1300-3.2), with that section's title (e.g. "Safety Class Items"), and as a direct quote (e.g. "Safety class items shall be subject ..."). Where words are left out of the quote, ellipsis (" ... ") are shown. Words added to the text are shown in square brackets and may replace a word of the text (e.g. "... as it requires ..." may appear as " ... as [section 1300-3.2] requires ..."). Any criteria not from DOE Order 6430.1A are explicitly referenced.

3.1 GENERAL REQUIREMENTS

Section 1300-3.2, "Safety Class Items," states "Safety class items shall be subject to appropriately higher-quality design, fabrication, and industrial test standards and codes ... to increase the [item's] reliability ... and allow credit ... for [the item's] capabilities in a safety analysis." Since none of the standards and codes identified in DOE Order 6430.1A specifically relate to level detection instrumentation, the recommended instrument's reliability will be assessed by testing (see section 4.0 for a discussion of the testing).

Section 1300-3.2, "Safety Class Items," also states "Failure of [non-safety class] items shall not adversely affect the environment or the safety and health of the public. In addition, their failure shall not prevent safety class items from performing their required functions."

3.2 SINGLE FAILURE CRITERIA AND REDUNDANCY

Section 1300-3.3, "Single Failure Criteria and Redundancy," states "The design shall ensure that a single failure ... does not result in the loss of capability of a safety class system to accomplish its required safety functions." The Glossary states "**Single failure.** An occurrence that results in the loss of capability of a component to perform its intended safety function(s). Multiple failures, i.e., loss of capability of several components, resulting from a single occurrence are considered to be a single failure. Systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor, (2) a single failure of any passive component (assuming active components function properly) results in loss of the system's capability to perform its safety function(s)." Section 1300-3.3, "Single Failure Criteria and Redundancy," also states "To protect against single failures, the design shall include appropriate redundancy and shall consider diversity to minimize the possibility of concurrent common-mode failures of redundant items."

Section 1660-99.0.2, "Protection System and Instrumentation and Controls," states "The design of safety class instrumentation ... shall provide suitable redundancy and diversity to ensure that safety functions can be completed, when required, and that no single failure will result in the loss of the protective functions."

None of the level devices identified by the technical contributors' group would meet the single failure requirement in one device. To meet this requirement, the design should provide two diverse methods of measuring the level in the tank.

3.3 ENVIRONMENTAL CONSIDERATIONS

These considerations have to do with the environment to which the gage is exposed. Those components exposed to the weather should be designed for the outdoor environment; those exposed to the tank environment should be designed for the chemical and radiological environment of the tank. Section 1300-3.4.1, "General," states "Safety class items shall be designed to withstand the effects of, and be compatible with, the environmental conditions associated with operation, maintenance, shutdown, testing, and accidents. The environmental capability of equipment shall be demonstrated ..."

Section 1300-3.4.2, "Environmental Qualification of Equipment," states "Equipment qualification shall provide assurance that safety class items will be capable of performing required safety functions under DBA conditions. The qualification shall demonstrate that the equipment can at least perform for the period of time that its safety functions are required." The Glossary states "**Design basis accidents (DBAs).**

Postulated accidents, or natural forces, and resulting conditions for which the confinement structure, systems, components, and equipment must meet their functional goals... The postulated environment shall reflect an environment that considers both the radiological composition ... and chemical composition ... of all material physical forms likely to affect the equipment."

Section 1300-3.4.3, "Equipment Operability Qualification," states "Testing or a combination of testing and analysis shall be the preferred method of demonstrating the operability of ... instrumentation ... that are required to operate during and following a DBE."

3.3.1 Design Basis Accidents

Hanford Plant Standards, SDC-4.1, "Standard Architectural-Civil Design Criteria, Design Loads for Facilities", Section B.2, "Design Basis Wind (DBW)," gives the following: "Fastest-Mile [wind] Speed 90 mph ... Missile (horizontal) 2 X 4 Timber Plank 15 lb @ 50 mph (73.5 fps) ... Protection from missile penetration and the secondary effects of scabbing shall be provided." Section B.3.a(3), "Design Basis Earthquake (DBE) for Non-Reactor Structures," states "Response spectra for the design ground motion for the [DBE] are specified in Figure 3." Figure 3 shows the spectra with a loading of 0.20 g acceleration. Section B.3.b, "Damping," states "The percentage of critical damping used for the design, and analysis of non-reactor facilities shall conform to the values in UCRL-15910, unless otherwise justified in the design documentation." Section B.5, "Design Basis Ashfall," states "All new [SC-1] structures, systems and components are required to meet the design basis ashfall criteria as follows:"

"Thickness of ashfall:
4.5 inches uncompacted
3 inches compacted

Duration and rate of ashfall:

Duration of ashfall	20 hours
Maximum ashfall rate	0.45 inches per hour for 6 hours
Average ashfall rate	0.15 inches per hour

Design ashfall loading:
24 psf dry, compacted

Density of ash:

Dry, loose	72 pcf
Dry, compacted	96 pcf
Wet, compacted	101 pcf"

Hanford Plant Standards, SDC-4.1, "Standard Architectural-Civil Design Criteria, Design Loads for Facilities", Section B.5, "Design Basis Ashfall," also states "Ashfall loading is to be combined with snow load. Ashfall in combination with snow loading will normally produce the highest loading for design." Section C.3.b, "Roof Loads," states "... [15] pounds per square foot (psf) shall be used as the ground snow load..."

3.4 MAINTENANCE

Section 1300-3.5, "Maintenance," states "The design shall consider the maintainability factors peculiar to the specific equipment ... [and] shall provide for routine maintenance, repair, or replacement of equipment subject to failure." Additionally, it states "Safety class items shall be designed to allow inspection, maintenance, and testing to ensure their continued functioning, readiness for operation, and accuracy. ... The capability shall be provided for the maintenance of contaminated equipment that cannot be repaired in place. This capability shall include necessary provisions for confinement, ventilation, and waste control."

3.5 TESTING

Section 1300-3.6, "Testing," states "The design shall include provisions for periodic testing ... In addition, the design shall provide the capability to test periodically, under simulated emergency conditions, safety class items that are required to function under emergency conditions."

Section 1660-99.0.5, "Testing and Calibration," states "The design of ... safety class instrumentation ... shall provide for the periodic in-place testing and calibration of instrument channels and interlocks."

3.6 ELECTRICAL POWER

Section 1660-99.0.1,"Safety Class (Emergency) Electrical Systems," states "For safety class items that require electric power to perform their safety functions, the design shall provide safety class emergency electric power systems ... Safety class electric systems shall be provided with suitable redundancy and separation to ensure that adequate capacity and capability are available with the addition of a single failure. ... IEEE 379 ["Standard Application of the Single Failure Criterion to Nuclear Power Generating Station Class 1E Systems"] and IEEE 384 ["Standard Criteria for Independence of Class 1E Equipment and Circuits"] shall be used as redundancy and separation criteria."

3.7 SAFETY CLASS INSTRUMENTATION

Section 1660-99.0.2, "Protection System and Instrumentation and Controls," states "Safety class instrumentation shall sense abnormal conditions affecting safety and subsequently provide an alarm ... Safety class instrumentation ... shall provide audible and visual alarms so that the operator can take timely corrective actions to ensure the safety of operating personnel and the public. The safety class instrumentation shall be designed to monitor safety-related variables ... over expected ranges for normal operation, anticipated operational occurrences, DBA conditions, and for safe shutdown."

3.8 SEPARATION AND PHYSICAL PROTECTION

Section 1660-99.0.4, "Separation and Physical Protection," states "Redundant ... safety class channels shall be physically protected or separated to prevent a common external event or failure of one channel from causing failure in the redundant channel. ... safety class instrumentation ... shall be appropriately separated or isolated from other instrumentation and control systems to the extent that failure ... in these systems will not degrade the safety class systems."

3.9 WASHINGTON ADMINISTRATIVE CODE (WAC) 173-303

The following are relevant excerpts from WAC 173-303-640:

"(4) Containment and detection of releases.

(a) In order to prevent the release of dangerous waste or dangerous constituents to the environment, secondary containment that meets the requirements of this subsection must be provided. . . . .

(c) To meet the requirements of (b) of this subsection, secondary containment systems must be at a minimum: . . . .

(iii) Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of dangerous waste or accumulated liquid in the secondary containment system within twenty-four hours, or at the earliest practicable time if the owner or operator can demonstrate to the department that existing detection technologies or site conditions will not allow detection of a release within twenty-four hours. . . "

(7) Response to leak or spills and disposition of leaking or unfit-for-use tank systems.

(d) Notifications, reports.

(i) Any release to the environment, except as provided in (d)(ii) of this subsection, must be reported to the department within twenty-four hours of its detection. Any release above the "reportable quantity" must also be reported to the National Response Center pursuant to 40 CFR Part 302.

(ii) A leak or spill of dangerous waste is exempted from the requirements of (d) of this subsection if it is:

(A) Less than or equal to a quantity of one pound, or the "Reportable Quantity" (RQ) established in 40 CFR Part 302, whichever is less; and

(b) Immediately contained and cleaned-up."

WAC 173-303 requires the owner/operator of a hazardous waste facility to monitor for leaks on at least a daily basis. It does not specify an accuracy requirement for level detection systems. It only addresses reporting and cleanup criteria for leaks of hazardous waste. All leaks identified for single shell tanks are required to be reported within 24 hours of leak determination with a provision to report at the earliest practicable time if the detection technologies and conditions will not allow detection of a release within 24 hours. The same requirements for leak detection are applied to single-shell tanks as for double-contained tanks.

From these excerpts, any leak from a single-shell tank that is not immediately contained and cleaned-up must be reported.

4.0 TESTING RESULTS SUMMARY

This section provides a summary of the testing results for several level gages. A comparison of level instruments was put together by Pacific Northwest Laboratories from their testing results and is shown in table 4.0.

Six gages were tested in seven configurations. The gages were: 1) Robertshaw Model 185A Inven-tel™ Float activated Level Gage, 2) Enraf Series 872 Radar Gage (872 Radar), 3) CannonBear 4 inch Radar Level Gage, 4) Stanley Tools Laser Level Detector, 5) Enraf Series 854 Advanced Technology Gauge (854 ATG), and 6) Robertshaw Model 185A Inven-tel™ conductivity gage. Additionally, Westinghouse Savannah River Company provided test results for a laser survey instrument they are testing as a possible replacement for their zip cord readings (open riser manual tape level readings).

4.1 ROBERTSHAW MODEL 185A INVEN-TEL™ FLOAT

The testing showed a very good response to the surface level; well within the tenth of an inch desired. The float probe requires two conductor tape to connect to the body of the gage. The insulation on the two types of two conductor tape would quickly disintegrate in our tank environment (one due to radiation, and the other due to the caustic vapors above the waste). This gage is not recommended for use in our tanks because of the disintegration.

4.2 ENRAF SERIES 872 RADAR GAGE

4.2.1 Initial Installation Testing

This gage was installed in tank 241-SY-101 for test purposes. The laboratory testing of the radar gage showed equivalent response to the existing gage and, as a non-contact gage, reduced maintenance problems. It had the additional advantage of being qualified intrinsically safe for hydrogen gas. The field testing in 101-SY has shown that the readings are very susceptible to what passes into the gage's field of view. A floating piece of dry salt cake would cause the level reading to change (rise as it came into the field of view and fall as it left it) without the existing level gage showing any change. Pacific Northwest Laboratories did basic testing of this gage to show the interaction of the riser to the gage.

4.2.2 Pacific Northwest Laboratories Testing of Modified Installation

A different installation configuration was recommended by the manufacturer after describing the problems being experienced and how the gage is installed. Pacific Northwest Laboratories tested the manufacturer's recommended modified installation

Table 4.0 Comparison of Different Level Measurement Instruments

Surface Type	Radar	ATG	Sonic	Optical Rangefinder	Bubbler	Pressure Transducer
Clear Liquid	Yes	Yes	Yes	No (17)	Yes	Yes
Unclear Liquid	Yes	Yes	Yes	Yes	(1)	Yes
Soft (2)	(3)	Yes	Yes	Yes	No	Yes
Hard (4)	(5)	(5)	(5)	(5)	No	Yes
Dark	Yes	Yes	Yes	No	Yes	Yes
Salt Islands + Liquid (6)	Yes	Yes	Yes	Yes	No (7)	No (7)
High Heat	Yes	(8)	(9)	(8)	(10)	Yes
Hydrogen Generation	Yes	Yes (19)	(11)	(12)	Yes	Yes
Repeatability (inches) (13)	± 0.10	± 0.01	± 0.04	± 0.10 - ± 0.70	± 0.10	± 0.4 - ± 2 (20)
Notes	(14)	(15)	(16)	(17)	(18)	(18)

1. The technique may or may not work depending on the amount of suspended particles in the liquid.
2. Consistency similar to peanut butter.
3. This technique may or may not work depending on surface reflectivity.
4. Consistency similar to a snow cone.
5. This technique may or may not work depending on the degree of unevenness of the surface.
6. All of the techniques will obtain inconsistent results if the salt cake moves into the field of view of the instrument.
7. Cannot measure salt island. Surface movements could damage probe. Tube clogging a major problem.
8. May be affected by thermal changes.
9. Commercial systems that were tested only operated to 140°F.
10. Depending on the design of the system.
11. Commercial systems are not intrinsically safe.
12. It would be necessary to keep the instrument out of the tank and project light through a window. Care would have to be taken to prevent the window from fogging up. Also, the riser needs to be straight.
13. Testing was for repeatability, not measurement accuracy.
14. In order to obtain accurate measurements, it is necessary that the surface not have appreciable changes in its conductivity or permissivity.
15. Salt crystals may grow on the displacer, which will affect its accuracy depending on the density of the salt crystals compared to the surface.
16. The sonic sensors did not have enough power, and had to be placed a few feet above the surface.
17. The device that was tested did not have enough power to accurately measure rough surfaces or a clear liquid. Other electro-optical rangefinders are on the market.
18. Needs to be placed in the waste materials, and hence must be able to withstand the radiation, heat, and highly caustic environment.
19. This device is certified to be explosion proof.
20. This assumes the gage can be compensated for temperature effects. Long term stability can double this error in one year of use.

configuration. The modification entailed adding an extension to the gage to extend the 8 inch diameter to beyond the end of the 12 inch riser. The testing of this configuration did not show improvement in the measurement over the current configuration. It did result in a smaller foot print for the gage at the same distance if the extension was used which could be important for some tanks. The other gage problems remained unaffected.

4.3 CANNONBEAR 4 INCH RADAR GAGE

The CannonBear radar gage was obtained because of the good response in the laboratory testing of the Enraf 872 Radar gage; because it was able to go in a 4 inch riser; and, it had a 4 to 20 milliamp output signal which made it easier to record the data. During preliminary laboratory testing, this gage did not achieve our operating ± 0.25 inch accuracy (performance was ± 1 inch). It did meet the manufacturer's specifications (± 0.5% max range) but had a non-linear error much greater than could be tolerated.

4.4 STANLEY TOOL LASER LEVEL GAGE

Stanley Tool Company demonstrated a proprietary new laser range finder. It was thought that with a minor amount of development a level gage could be made using the tool. Pacific Northwest Laboratories provided a testing set up and a series of tests were completed using the prototype device. The device generally performed with an accuracy of between ± 0.3 and ± 0.4 inches. It has the advantage of being a non-contact gage but can not measure a clear liquid or highly absorbent materials.

4.5 ENRAF 854 ATG

Testing on this gage completed by Pacific Northwest Laboratories has demonstrated the gage met most of the requirements. Since the gage contacts the waste, crystals can form on the displacer and change its apparent weight. This means that the level reading could increase (if the crystal floats in the liquid), remain the same (if the crystal is neutrally buoyant), or decrease (if the crystal sinks in the liquid). The testing showed that periodic weighing of the displacer and adjusting for the added weight of the crystal (if the crystal sinks in the liquid) will return the level reading to its proper value. The gage contains a test function that will weigh the displacer. This function could be included as part of the gage's periodic maintenance.

4.6 ROBERTSHAW MODEL 185A INVEN-TEL™ CONDUCTIVITY GAGE

Preliminary testing of the Robertshaw Model 185A Inven-tel™ conductivity probe shows it also meets our operating accuracy requirement. This gage is the modern replacement for the existing FIC gages. It uses the tank contents as the return path for detection. If the surface is non-conductive, or so dry as to have a low conductivity, the gage will fail to detect the proper level. Additionally, since the probe has a sharp point on it, it tends to "punch a hole" in the crust. Crystal growth on the FIC probes (similar to the 185A probe) has been a major maintenance problem for some tanks.

4.7 WESTINGHOUSE SAVANNAH RIVER COMPANY TESTING OF DISTOMAT LASER LEVEL DETECTOR

Westinghouse Savannah River Company has been testing the Distomat laser surveying instrument for possible use in their tanks as a replacement for their zip cord level detector. They completed preliminary testing on the device January 28, 1993. Using a water liquid surface looking through a pipe, they observed an accuracy of ± 0.1 inches. Their testing has progressed to the stage of having field trials on actual tanks. To date (March 11, 1993), one tank has been tested using this gage. It worked very well. This gage is not designed for continuous readings nor for connecting to a data logging system. It is for these reasons that it is not recommended as a replacement for the existing FIC gages.

5.0 RECOMMENDATION

This section presents the recommended design and associated aspects of that design and presents a discussion of how this recommendation meets various aspects of the design constraints.

5.1 RECOMMENDED DETECTOR

The Enraf 854 ATG level detector is the recommended detector. A similar gage manufactured by L&J Technologies will be tested as a possible alternate detector. The Robertshaw Model 185A Inven-tel™ conductivity probe could be used but was not the preferred gage since it relies on the tank contents as a return path and since crystal buildup would affect the reading. With the 854 ATG, a periodic maintenance procedure could measure crystal growth using a built-in test function. The 185A does not have such a feature. A generic installation design is being prepared for the Enraf gage. This system will provide the main level detection. The gage will replace the existing FIC gage in riser number 1. The read-out will initially be local to the gage.

5.2 RECOMMENDED REDUNDANCY

Tank 101-T has a manual tape level detector installed in riser number 7. This system uses a different method of measuring the level (conductivity) and so provides the necessary diversity to prevent common mode failures. Additionally, the manual tape device uses battery power and so the power to the Enraf gage does not need to be a safety class electric system since no failure of the power to the Enraf gage could cause a failure of the manual tape power supply.

5.3 SEPARATION AND PHYSICAL PROTECTION

The manual tape installation is on riser number 7 while the Enraf gage will be in riser number 1. These risers are on opposite sides of tank 101-T and therefore are as physically separated as possible.

5.4 TESTING AND CALIBRATION

The generic installation design for the Enraf gage includes a sight glass to provide a point check of the level detection system. The level value for that reference level will be utilized to check the calibration of the gage. It will also provide a method for observing the displacer condition. Crystal growth, corrosion, deterioration, etc., can be observed and corrected before becoming a problem.

5.5 MAINTENANCE

The generic installation design for the Enraf gage includes an access port below the sight glass. This port can be used to replace the displacer. The displacer is one part that may require replacement and the design includes provision for that activity.

The design also includes a section below the access port for washing down the displacer similar to the system used for the FIC gage. This should allow for some amount of crystal removal without having to remove the displacer. The 854 ATG has a designed mean time before failure of more than 10 years.

5.6 ENVIRONMENTAL QUALIFICATION

The 854 ATG is designed for outdoor use and has been used extensively in the oil industry for level. Before the generic installation design could be used on tank 101-T, safety assessments of its ability to withstand DBAs would be required.

5.7 WAC 173-303

The Enraf gage takes readings at a frequency set by the user up to several times a minute. Readings of the gage will initially be done by operators at whatever frequency is needed. If the Enraf gage fails, the manual tape reading can be taken.

Tank 101-T is a 75 foot diameter storage tank so one inch of level change is equal to about 2752 gallons of volume change. The manufacturer of the recommended gage (Enraf-Nonius) specifies a measuring accuracy of ± 0.04 inches which was confirmed in our lab testing. This represents approximately 110 gallons in tank 101-T. This does not meet the WAC 173-303-640 (7)(d) requirement of one pound (0.125 gallons). This technology limits detecting and reporting leaks on the basis of the "earliest practicable time" rather than within 24 hours as stated in WAC 173-303-640(4)(c)(iii).

5.8 RECOMMENDATION FOR 101-T IF PUMPED

The current method of tracking the liquid in a pumped down tank is through the use of a Liquid Observation Well. This is because the sludge surface does not need to drop for liquid to be leaking from the tank. The liquid could drain out of the interstitial regions within the sludge without the surface level changing. The LOW would be monitored using the existing drywell van monitoring equipment. The accuracy of this method was not tested as a part of this effort.

6.0 REFERENCE

WHC 1989b WHC-SD-WM-TI-357, *Waste Storage Tank Status and Leak Detection Criteria*, September 1989

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