Regional Citizens' Advisory Council / *"Citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers."*

In Anchorage: 3709 Spenard Road / Suite 100 / Anchorage, Alaska 99503 / (907) 277-7222 / FAX (907) 277-4523
In Valdez: P.O. Box 3089 / 130 South Meals / Suite 202 / Valdez, Alaska 99686 / (907) 834-5000 / FAX (907) 835-5926

Dear Reader:

During May of 2006, a concerned citizen requested that Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) make inquiry into specified and unspecified reports from other concerned individuals pertaining to the integrity of tank welds whose failure was alleged to have the potential for producing a "tsunami of oil" in Port Valdez. The VMT Systems Integrity project was created in July 2006 to examine integrity issues associated with the reports and to ensure that any identified integrity issues do not pose an increased risk for spillage of oil.

PWSRCAC tasked Harvey Consulting with assisting staff in identifying specific integrity issues that may be further explored by a welding or other expert and preparing a report including the review of collected information and citing any recommended findings. Harvey Consulting produced a set of four reports and a summary set of findings documents covering issues associated with Tanks 55, 16, 5, and 93.

PWSRCAC accepted these reports and summary of findings as meeting the terms and conditions of its contract with Harvey Consulting and also for public distribution. Attached to this letter are the following documents:

(a) "Contract 505.2007.01 – VMT System Integrity Issues Summary of Harvey Consulting Finding of Facts, Allegations, and Recommendations," dated April 5, 2007.
(b) "Valdez Marine Terminal Tank 55 Alleged Integrity Concerns Preliminary Investigation" Revision 2 dated March 15, 2007.
(c) "Valdez Marine Terminal Tank 5 Alleged Integrity Concerns Preliminary Investigation" Revision 3 dated March 13, 2007.
(d) Valdez Marine Terminal Tank 16 Alleged Integrity Concerns Preliminary Investigation" Revision 3 dated March 13, 2007;
(e) "Valdez Marine Terminal Tank 93 Alleged Integrity Concerns Preliminary Investigation" Revision 2 dated March 14, 2007.
(f) ADEC Letter to Alyeska Pipeline Service Company, Subject: "Review of Employee Concerns, Inspections of Tanks 5, 55, and 93 Valdez Marine Terminal" dated April 25, 2003
(g) Bureau of Land Management Letter to Stan Stephens (Council President), Subject: Harvey Consulting, LLC., "Valdez Marine Terminal Tank Reports: Alleged Integrity Concerns Preliminary Investigations, Tanks 5, 16, 55, and 95," dated April 25, 2007.

Should additional information be needed, please contact PWSRCAC staff.

Sincerely,

John S. Devens

John S. Devens, Ph.D.
Executive Director

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Contract 505.2007.01 – VMT System Integrity Issues

Harvey Consulting LLC, Summary of Findings of Facts, Allegations, and Recommendations

April 5, 2007

The opinions expressed in this PWSRCAC-commissioned report are not necessarily those of PWSRCAC.

Tank 5	
Finding of Fact	
1	A new floor and cathodic protection system was installed during the summer of 2002.
2	APSC President Wight confirmed in writing an investigation was underway on Tank 5 to address concerns raised through Employee Concerns Program.
3	ADEC wrote to APSC not to return Tank 5 to service until concerns were resolved.
4	Tank 5 was returned to service on November 26, 2002.
5	ADEC or JPO have not provided a written record approving this tank to be returned to service. And, there is no written agency finding on or before the tank was returned to service resolving the allegations.
Allegations substantiated by Harvey Consulting, LLC. based on data available for review	
1	Internal roof inspection was not completed in accordance with inspector's recommendations; equipment to reach roof and inspection time denied.
2	Lack of construction and repair records available to inspector.
3	Annular plate not inspected after back-gouging.
4	Shell tank inspection was not completed in accordance with inspector's recommendations; equipment and inspection time denied.
5	No nameplate on tank.
6	Incomplete roof support column inspection.
Allegations which could not be fully evaluated due to lack of data available for review	
1	Material used to replace floor was substandard.
2	Improper testing of floor bottom plates.
3	Annular plate was not 100% inspected.
4	Floor plates were improperly welded to the annular ring.
5	No weld preheat on door cut in tank wall to repair tank floor.
6	Improper approval of joint design on door.
Harvey Consulting, LLC Recommendations	
1	Request additional records, and hire a welding expert evaluate the remaining six allegations including: floor material quality; floor quality testing; annular plate inspection after back-gouging; welding of floor to annular ring; heat treatment of metal on access door area; and joint design on access door area.
2	The next Tank 5 inspection is due by 2012, which is 5 years away. Additional information should be provided by the operator to ensure that there is no integrity concerns related to the allegations which were substantiated. The operator should provide data to ensure that there is no integrity risk in operating this tank for the next five years. Otherwise, an accelerated inspection schedule should be considered.

Tank 16	
Finding of Fact	
1	Floor was buckled around sump area.
2	Sump was removed and a new section of floor was installed to cover the area where the sump was removed.
3	Tank 16 is the only crude oil tank still in service with the original tank floor, with no cathodic protection.
4	The original floor is still installed with over 100 patches
5	ADEC or JPO have not provided a written record approving this tank to be returned to service. And, there is no written agency finding on or before the tank was returned to service resolving the allegations.
Allegations which could not be fully evaluated due to lack of data available for review	
1	Deformation around the sump may have caused a leak and ground water and soil may have been contaminated with crude oil.
Harvey Consulting, LLC Recommendations	
1	Work with APSC to have Tank 16 floor replaced and cathodic protection installed, if continued service is required. This tank is over 30 years old and is the only tank remaining in service without cathodic protection at the terminal. When the tank floor is replaced, soil contamination can be assessed and a remediation plan can be put in place, if necessary.
2	If Tank 16 is no longer required for service, the tank can be removed, and soil contamination can be assessed. A remediation plan can be put in place, if necessary.
3	Request additional information from ADEC, JPO and APSC to better understand the allegation. Site contamination is very serious allegation.

Tank 55	
Finding of Fact	
1	A new floor was installed during the summer of 2002.
2	ADEC wrote to APSC not to return Tank 55 to service until concerns were resolved.
3	Tank 55 was returned to service on November 26, 2002.
4	ADEC or JPO have not provided a written record approving this tank to be returned to service. And, there is no written agency finding on or before the tank was returned to service resolving the allegations.
Allegations substantiated by Harvey Consulting, LLC. based on data available for review	
1	Door sheet welded with wrong procedure. APSC did not demonstrate procedural equivalence.
2	Door sheet monitoring data is suspect, and may not be sufficient to ensure quality control.
3	Welding out of sequence on door sheet. Alyeska's quality documentation was not sufficient to demonstrate adherence to its own inspection, repair and quality control procedures.
Allegations which could not be fully evaluated due to lack of data available for review	
1	Floor plate laminations; potentially defective floor material used to repair the floor.
2	Foundation spalling.
3	Welded temporary attachments to annular ring. No preheat.
4	Improper coating of a 16" valve.
5	No records were provided to verify installation of required automatic valves.
Allegations found by Harvey Consulting, LLC. to be unsubstantiated	
1	"Peaking" of the shell to annual weld was distorted and out of compliance
2	Elimination of sump without having drawings as required.
Harvey Consulting, LLC Recommendations	
1	Request additional records, and hire a welding expert evaluate the door sheet welding and floor material quality.
2	Pursue additional information on other allegations
3	Alternatively accelerate the timeframe for the next inspection and repair of Tank 55.

Tank 93	
Finding of Fact	
1	Tank 93 was cleaned, inspected and repaired and raised on a concrete ring wall in 2002.
2	ADEC wrote to APSC not to return Tank 93 to service until concerns were resolved.
3	Tank 93 was returned to service on December 20, 2002.
4	ADEC or JPO have not provided a written record approving this tank to be returned to service. And, there is no written agency finding on or before the tank was returned to service resolving the allegations.
Allegations which could not be fully evaluated due to lack of data available for review	
1	Temporary clips welded to tank roof support columns resulted in damage which required repair.
2	Angle iron welded to shell and annular ring without any base plates.
3	Material used to replace floor was substandard.
4	Improper application of tank floor coating.
Harvey Consulting, LLC Recommendations	
1	Request additional records, and hire a welding expert evaluate the allegations including: floor material quality and welding procedures.

Valdez Marine Terminal

Tank 55

Alleged Integrity Concerns Preliminary Investigation

Report Requested by:
the Prince William Regional Citizens' Advisory Council

Prepared by:
Harvey Consulting, LLC.

December 20, 2006
Revision No. 1

March 15, 2007
Revision No. 2

Executive Summary

Prince William Sound Regional Citizens Advisory Council (PWSRCAC) requested Harvey Consulting, LLC's assistance to investigate the alleged tank integrity issues for Valdez Marine Terminal (VMT) Tank Number 55 (Tank 55). PWSRCAC received letters from Chuck Hamel in May, 2006, requesting the council investigate tank integrity issues on Tank 55, along with other tanks that were inspected and repaired in 2002. PWSRCAC requested Harvey Consulting review Alyeska Pipeline Service Company (APSC) records, agency records, meet with concerned individuals to better understand the scope of the allegations and make a recommendation for further action by PWSRCAC. This report summarizes the work completed by Harvey Consulting, LLC in the course of completing a preliminary investigation on the alleged Tank 55 integrity concerns.

Tank 55 is a 40,000 barrel diesel fuel storage tank, 100' in diameter and 31'8" tall. It was constructed in 1976. Tank 55 is located in secondary containment capable of storing the entire contents of the tank.

Tank 55 was inspected in 2002. The tank bottom corrosion was found. The tank bottom was replaced. A cathodic protection system was not installed to prevent future tank bottom corrosion.

Alaska Department of Environmental Conservation (ADEC) and the Joint Pipeline Office (JPO) received complaints about Tanks 5, 16, 55, and 93 during the spring, summer and fall of 2002. Multiple meetings were held between the agencies and whistleblower(s)/ concerned employee(s). ADEC withheld the whistleblower records from PWSRCAC on the basis of deliberative process and/or source confidentiality.

During the fall of 2002, ADEC and JPO investigated the whistleblower complaints, and requested additional information from the terminal operator, APSC. In November 2002, ADEC wrote APSC about Tank 55, stating it was the agencies understanding that Tank 55 would not be returned to service until the agency's investigation was completed. APSC responded that Tank 55 integrity was reviewed by its engineering team and they were comfortable that all the unsatisfactory inspection findings had been resolved, and that Tank 55 needed to be retuned to service for operational capacity. .On November 26, 2002 Tank No. 55 was returned to service.

There is no written record of ADEC or JPO approving this tank to be returned to service, nor were there any agency findings issued on or before this date. It was not until five months later, on April 25, 2003 that ADEC issued a findings document. ADEC substantiated two of the complaints. No compliance or enforcement actions were taken by ADEC on this matter.

JPO did not issue a report or finding on their investigation of Tank 55. No written records were provided to PWSRCAC showing any JPO involvement in these whistleblower complaints after November 2002. There is no JPO report analyzing compliance with state or federal requirements under the Trans-Alaska Pipeline (TAPS) grant and lease, or other state and federal oil spill prevention and tank construction, maintenance, or repair requirements or compliance orders. No written records were provided to PWSRCAC to explain why JPO closed its investigation without a report. No compliance or enforcement actions were taken by JPO on this matter. Mr. Harrison (JPO) was willing to be interviewed, and stated that his supervisors requested him to turn the investigation over to ADEC.

During the summer of 2006, ADEC and JPO indicated that state and federal agencies (including ADEC's criminal unit, EPA and FBI) are investigating whether the Tank 55 inspection and repair issues were properly handled. It is believed that Tank 55 is still under state and federal investigation at this time.

While ADEC eventually substantiated the two main door sheet welding allegations, the agency findings were not issued until almost five months after Tank 55 had been returned to service. Whistleblower(s)/concerned employees were frustrated by the protracted agency investigation, and were incensed when the agency finally substantiated the door sheet welding allegations, but took no enforcement action. It was alleged that some inspectors lost their jobs, and ruined their careers over this dispute. Court records show at least two employees working for the inspection company Kakivik Asset Management Company, filed a suit against the company for wrongful discharge after working on this project.

Overall, a main allegation was that APSC was not following it's own procedural requirements for welding and quality control on this project. While agency regulations require American Petroleum Institute Standard 653 (API 653) be followed during the inspection and repair of Tank 55, APSC developed a separate tank inspection and repair procedural manual for all project staff to follow when working on the 2002 Tank Project. APSC's manual included all the API 653 requirements, and added other agency requirements and APSC quality control standards. The inspectors and welders were given two important project documents by APSC to be followed for the inspection and repair of Tank 55: (1) Project Specification X052-T-500 Inspection Criteria and Project Technical Specification and (2) X052-T-411 defined the requirements for repair and alteration of aboveground storage tanks. Project Manual T-411, Section 1.1. states: "the requirements given herein supplement and modify those stipulated in the current edition of API 653." The inspectors alleged that APSC did not consistently follow their own inspection and repair criteria and quality control procedures. According to the complaints, the project manual was more stringent than the API 653 standards, but was only selectively followed by APSC, frustrating the inspection and repair staff.

There were 10 total allegations found in the Tank 55 records; six (6) documented by ADEC, and four (4) additional issues found in the records.

Four (4) of the 10 total allegations warrant additional review and advice from a weld expert, including Allegation Numbers 1, 2, 7 and 8:

Allegation No. 1 – Door sheet welded with wrong welding procedure.

APSC, the agencies and this report substantiate that the wrong welding procedure was used while welding a portion of the Tank 55 door sheet; however, there is no consensus on whether or not the use of the wrong welding procedure poses a mechanical integrity issue that warrants additional testing or tank repair. APSC maintains that the procedures were substantially similar, while the inspectors and Mr. Harrison (JPO) disagree.

Allegation No. 2 – No heat input monitoring for door sheet weld.

APSC's quality assurance documentation substantiates that no heat input monitoring occurred on about 60% of the Tank 55 door sheet welds. No quality control data were collected on any of the exterior welds. No quality control data were collected on the two main interior vertical welds. APSC maintains monitoring data for 40% of the welds is sufficient to ensure welding quality control. The inspectors maintain that APSC's own welding procedures and quality control program required data to be collected on 100% of the welds. Mr. Harrison (JPO) recommended a simple, cost effective hardness test be completed on the heat affected zone prior to returning the tank to service. This test was not done.

While APSC maintains monitoring data for 40% of the welds is sufficient to ensure welding quality control, this data appears suspect. Even APSC engineers evaluating the data in 2006 agree the data is abnormally consistent, and does not reflect the variability one would expect for this type of welding process. Allegations of record tampering exist.

Allegation No. 7 – Welded temporary attachments to annular ring. No preheat.

Inspectors raised a concern about temporary attachments being welded on the annular tank ring, potentially causing damage because the ring was not preheated, as required. This concern could not be substantiated through a review of the records, however if a welding engineer is brought in for a more detailed review of other Tank 55 issues, it is recommended a second technical opinion be given on this concern.

Allegation No. 8 – Welding out of sequence on door sheet.

A record review confirmed the door sheet welding was completed out of sequence. The integrity impact of this welding sequence should be reviewed by a welding engineer if one is brought in for a more detailed review of other Tank 55 issues.

Four (4) of the 10 total concerns require additional records to arrive at a conclusion, including Allegation Numbers 3, 6, 9 and 10:

Allegation No. 3 – Floor plate laminations.

It was alleged that defective material was used to replace the tank floor. It was alleged the defective material was repair welded and was not properly tested prior to returning the tank to service. Material delivery and additional quality records should be reviewed.

Allegation No. 6– Foundation Spalling.

The inspectors documented foundation spalling was a concern. No records could be found to verify whether this concern was addressed.

Allegation No. 9– Valve Coating

The inspectors documented improper coating of a 16" valve. No records were provided to verify the current condition of the valve coating, as acceptable.

Allegation No. 10– Installation of automatic valves

Agencies required APSC to install automatic valves on Tank 55. No records were provided to verify installation of the automatic valves was completed.

Two (2) of the 10 total concerns were not substantiated.
Allegation No. 4 – Shell Peaking

Allegation No. 5 – Elimination of the sump without having a drawing

Requests made for meetings with APSC staff, and APSC contractors, to discuss the Tank 55 allegations and review additional records were denied.

Requests made for meetings with ADEC staff, and former ADEC staff, to discuss the Tank 55 records were denied. However, Ms. Lewis (ADEC) did confirm:

> *There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.*[1]

In addition to the concerns raised by the inspectors, this report raises the question as to why cathodic protection was not installed under Tank 55 in 2002. While APSC decided not to install a CP system under Tank 55, because in their opinion, the amount of corrosion did not warrant it.[2] APSC did find corrosion was significant enough to warrant replacing the entire Tank 55 floor. There is an inconsistency here. Recent inspection results from the adjacent diesel fuel tank (Tank 56), also found significant floor corrosion warranting installation of cathodic protection. It is recommended that Tank 55 be considered for a cathodic protection upgrade as well.

[1] August 30, 2006 e-mail from Ms. Lewis (ADEC) to Ms. Harvey (PWSRCAC) copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses.
[2] August 27, 2002 Internal APSC memo from Kelly Lee (APSC) to Tom Stokes (APSC), Tank 55 floor plate data.

While investigating these concerns it is important to note that there is a secondary containment liner made of catalytically blown asphalt under the entire Tank 55 area. If Tank 55's door sheet was to fail, spilling the contents of the tank, it should be contained within the existing secondary containment area. It is unlikely that there would be a simultaneous leak in both the tank and the secondary containment. There are also natural on-land containment basins below Tank 55 that would also impede product flow to the port area, and provide tertiary containment. Therefore, the risk of wide-spread environmental contamination should not be significant.

Information Available For This Report

PWSRCAC requested records from ADEC and JPO. ADEC and JPO provided physical copies of letters via U.S. Mail. A written request for additional agency records was prepared by Harvey Consulting, LLC, for PWSRCAC in June 2006, but was not sent by PWSRCAC. Attempts to set up additional meetings with ADEC to obtain additional information were denied. A meeting was held with Willie Harrison (JPO) to obtain some additional information.

In May 2006, PWSRCAC requested an opportunity to review APSC Tank 55 records from the 2002 timeframe. In June 2006, PWSRCAC visited APSC's Anchorage office to read and take notes, but not photocopy, information from the Tank 55 files quality documentation files.[3] Attempts to set up additional meetings with APSC Engineering to obtain additional information were denied. APSC required all questions of the APSC Engineering to be put in writing and allowed written responses to the inquiries by the inspection and engineering staff, after review and approval by APSC management.

On November 26, 2002 Tank No. 55 was returned to service. Neither ADEC nor JPO produced any written record showing the agencies approved this tank to be returned to service, nor were there any documented agency findings issued on or before this date. PWSRCAC should request agency records which approved this tank to be returned to service.

Allegations

Employees working at the VMT during the 2002 Tank 55 inspection and repair work allege that material used to replace the tank floor was sub-standard, there was faulty welding and a number of inspection findings that were ignored.

Six Tank 55 Allegations

In late 2002, ADEC started an investigation into the allegations raised during the 2002 VMT Tank Inspection and Repair Program. On April 25, 2003, ADEC issued a findings document

[3] June 14, 2006 and June 20, 2006

summarizing the results of their investigation.[4] This report shows six Tank 55 allegations were reported to ADEC and investigated, and four additional Tank 55 concerns were found in the records.

During the interviews conducted by Harvey Consulting, LLC, several people continued to be most concerned about the welding procedures and quality control on the door sheet of Tank 55.

Background

According to industry standard API No. 653 tanks are typically internally inspected at least once every decade, unless tank integrity history or risk, indicate a different interval. In 2002, Tank 55 was due for an internal tank inspection.

During 2002, Tank 55 was cleaned, inspected, repaired, and returned to service.

Chronology of Events

This section provides a brief chronology of events associated with the inspection and repair work completed on Tank 55 and the subsequent investigation into employee(s) allegations.

> **Important Note**: Many undated records are listed by ADEC in correspondence with PWSRCAC. Although PWSRCAC made a public records request for Tank 55 records, most records associated with the agency investigation into employee allegations on Tank 55 were withheld from PWSRCAC, so it is not possible to list each of the whistleblower meetings or agency findings in the chronology. In the ADEC files there was an undated memo on Tank 55 allegations prepared by JPO. This document was also withheld by ADEC.[5]

1976
Tank 55 (diesel storage tank) was constructed with a shell thickness of 0.316 inches (course number one; the lowest level of the tank).

1998
TANCO Engineering Inc. (TANCO) was awarded the VMT tank maintenance and repair contract. To qualify as the VMT welding contractor, TANCO prepared welding test panels and procedure qualification requirements (PQRs) to demonstrate their ability to weld VMT tanks. TANCO and APSC developed two welding procedures[6] for diesel storage tanks of 0.312" thickness, and two welding procedures for crude oil storage tanks of a 0.625" shell thickness. The diesel tank welding procedures approved in 1998 were not the same as crude oil tank welding procedures.

[4] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.
[5] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[6] vertical and horizontal welding procedures

March 27, 2002
Mr. Stevens (APSC employee at this time) prepared a Tank 55 door sheet removal, replacement, and welding/NDE/pressure testing procedure. This procedure was approved by Tony Balowski (APSC welding engineer). In error, the procedure called for use of a crude oil tank welding procedure rather than a diesel tank welding procedure.

May 14, 2002
A letter from APSC notified ADEC and JPO that APSC planned to inspect and repair Tank 55.[7]

Summer 2002
Tank 55 was cleaned, inspected, and repaired. A new tank floor was installed. A cathodic protection (CP) system was not installed. A number of employee concerns were reported to ADEC during the summer of 2002 about the Tank 55 repairs.[8] There was debate about the logic on not installing a CP system.

July 31, 2002
ADEC requested Tank 55 drawing and corrosion data summary.

August 8, 2002
Department of Labor complaint which was filed against Kakivik Asset Management Inc. (KAM) and Alyeska Pipeline Service Company on August 8, 2002, by Denis Vamvoras. [9]

August 27, 2002
APSC Engineering Department reviewed the amount of floor corrosion on Tank 55, and determined the corrosion rate was not as "severe" as indicated by the inspectors. APSC concluded ultrasonic thickness (UT) measurement devices used by the inspectors provided unreliable data. APSC found the Tank 55's floor was not as corroded as the inspectors thought. APSC decided not to install a CP system under Tank 55, because in their opinion, the amount of corrosion did not warrant it.[10] Yet, APSC did find corrosion was significant enough to warrant replacing the entire Tank 55 floor.

August 2002 (various dates)
ADEC records contain copies of e-mails provided by various APSC employees and contractors on Tank 55 concerns. These documents are withheld by ADEC because they could disclose the identity of a confidential source.[11]

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[7] May 14, 2002 letter from Rod Hanson (APSC) to Bonnie Friedman (ADEC) and John Kerrigan (JPO) and Jerry Brossia (JPO), Crude Tank Inspections – West Tank Farm, Valdez Marine Terminal

[8] ADEC's letter to PWSRCAC dated June 19, 2006, stated that from June 2002 through September 2002 various APSC employees and contractors provided ADEC with copies of emails relating to Tank 55. Interviews with Mr. Harrison (JPO) in August 2006 confirmed that Tank 55 integrity allegations were reported to JPO and ADEC during the summer and fall of 2002.

[9] The case against KAM is titled Vamvoras v. Kakivik Asset Management Inc., Case 2003-WPC-00004. This case was argued before Administrative Law Judge (ALJ) Larry Price.

[10] August 27, 2002 Internal APSC memo from Kelly Lee (APSC) to Tom Stokes (APSC), Tank 55 floor plate data.

[11] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.

September 14, 2002
The Tank 55 door sheet was welded using welding procedures for a 0.625"thick crude oil tank shell, instead of a thinner diesel tank shell. Welding continued through September 16, 2002 until the error was found by Kakivik Asset Management (KAM) Inspector, Mr. Kale.

September 16, 2002
Inspector Kale finds Tank 55 door sheet was welded using the wrong procedure. This error is documented in the Tank 55 records as Unsatisfactory Finding No. 19 (UNSAT #19).

September 17, 2002
Inspector Kale finds many of the Tank 55 door sheet welds were completed without collection of in-process welding data. No data was collected on any of the outside welds and inside vertical field welds (FW-4 and FW-8).

September 17, 2002
Mr. Hodges (KAM Inspector) rejects door sheet field weld No. 4 (FW-4) and No. 6 (FW-6) based on nondestructive testing (NDE).
Field welds (FW-4 and FW-6) are repaired and re-inspected and accepted by Mr. Hodges with a radiographic test. A magnetic particle inspection was also performed by Mr. Brennan (KAM Inspector) and the test was accepted for sheet repair.

September 18, 2002
Tank 55 API Inspection was completed by Curtis Sipe, API 653 Authorized Inspector No. 3107. Inspector Sipe's report was issued on October 3, 2002.

September 20, 2002
Inspector Kale documents an Unsatisfactory Finding No. 20 (UNSAT #20), because an approved welding procedure was not in place for the Tank 55 when the welding of the door sheet occurred.

Tony Balowski (APSC Welding Engineer) amends the crude oil tank welding procedure specifications to include diesel tanks such as Tank 55 four days after the welding procedure error was found by Inspector Kale.[12]

Mr. Stevens (earlier in 2002 an APSC employee who originally wrote the Tank 55 welding specifications, but by the fall of 2002 is a KAM Inspector) changes the Unsatisfactory Inspection Finding No.20 (UNSAT#20) to a satisfactory inspection finding. UNSAT #20 was written earlier in the day by Inspector Kale for lack of a Tank 55 welding procedure. Inspector Stevens notes: "[w]elding procedures were submitted, approved by Alyeska, and in place for the welding of the door sheet." Conflict of interest concerns arise, and are communicated to the agency by employees. There are assertions that Inspector Stevens should not be able to sign off unsatisfactory procedures which he is alleged to be instrumental in creating.

[12] WPS No. T-400-2G-1 (horizontal welds in a thicker walled 0.625"-1.25" crude oil tanks) and WPS No. T-400-3G-1 (vertical welds in a thicker walled 0.625"-1.25"crude oil tanks).

September 20, 2002
ADEC records contain meeting notes with a whistleblower about the 2002 VMT Tank Program allegations; however, this document is withheld from PWSRCAC under a deliberative process claim by ADEC. The author of the meeting notes is listed by ADEC as "uncertain."[13]

September 25, 2002
APSC provided ADEC with Tank 55 drawing and corrosion data summary, almost two months after it was requested on July 31, 2002.[14]

September 2002 (various dates)
ADEC records contain copies of e-mails provided by various APSC employees and contractors on Tank 55. These documents are withheld by ADEC because they could disclose the identity of a confidential source.[15]

October 1, 2002
Mr. Harrison (JPO) and Ms. Friedman (ADEC) met with a concerned employee. The employee was working at the VMT and was concerned about repairs being made to Tank 55. The main concerns were about the welding process (lack of data being collected for quality control, and use of incorrect procedures).

October -November, 2002 (various dates)
Mr. Harrison investigated the employee concerns and requested a list of all unsatisfactory conditions found on Tank 55 from APSC Management.

October 2, 2002
ADEC conducted a VMT Tank Inspection on July 18, 2002 and issued a report on October 2, 2002. The agency report asks APSC to verify if the automatic valves were installed and if the 48-hour leak tests were performed. ADEC reports they had only recently received the drawings and corrosion data, and would be reviewing that material soon. There are no other problems on Tank 55 reported by the agency.

October 3, 2002
Tank 55 API Inspection report was issued by Curtis Sipe, API 653 Authorized Inspector No. 3107. The report confirmed that: Tank 55's floor was replaced due to heavy top side pitting over 50% of the floor plates; the concrete ringwall has several racks around the tank periphery; and consideration should be given to properly cleaning and recoating the roof to prevent further corrosion.

A construction door sheet was cut into the Tank 55 shell. All non-destructive testing of API 653 Section 10 were fulfilled after the door sheet was welded in place. Alyeska engineering approved all welding procedures prior to installation of the door sheet. Radiography was completed and accepted.

[13] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[14] September 25, 2002 letter from Rod Hoffman (APSC) to Bonnie Friedman (ADEC), VMT Tank 55 Information.
[15] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.

Note: While there were –in fact- welding procedures approved for Tank 55 prior to welding the door sheet, the welding procedures were for a crude oil tank, not a diesel tank. Many documents concluded there were welding procedures in place – insinuating no integrity problem existed– yet APSC, the agency and this author all agree that the originally approved welding procedures were to be used for crude oil storage tanks rather than the thinner-shelled diesel tanks.

Inspector Sipes determines the tank is suitable to be returned to service, once his recommendations are completed.

October 11, 2002
ADEC communicates via e-mail to JPO Employee Concerns Program (ECP) Specialist about the 2002 VMT Tank Program allegations; however, this document is withheld from PWSRCAC under a deliberative process claim by ADEC.[16]

ADEC records contain an ADEC engineer's recommendations on Tank 55; however, this document is withheld by ADEC under a deliberative process claim.[17]

ADEC sends a letter to APSC requesting information on Tank 55. The letter states:

> *The Department is aware that these tanks will not be returned to service until such time that certain issues have been resolved. In consideration of Alyeska's need for use of the tanks, particularly Tank 55, the Department will make every attempt to conclude its investigation in the most expedient possible manner….We understand that getting Tank 55 back into service is of critical importance to APSC. By resolving the door sheet welding and hydrostatic testing issues, the Department would be confident that the tank may be returned to service.*[18]

October 13, 2002[19]
Mr. Kale is laid off from KAM Inspection Company.

October 14, 2002
An internal APSC memorandum was produced to respond to ADEC concerns.[20]

[16] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[17] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[18] October 11, 2002 Letter from Bill Hutmacher (ADEC) to Robert Shoaf (APSC), Request for information on inspection and repairs of Tanks 5, 55 and 93.
[19] Mr. Kale was laid off by Kakivik Asset Management, October 13, 2002. Mr. Kale filed a lawsuit against Kakivik Asset Management, claiming wrongful discharge, due to raising inspection concerns to management and the agencies. Mr. Kale settled with Kakivik Asset Management out of court for an undisclosed amount of money. Mr. Kale also filed a complaint with the U.S. Department of Labor about the 2002 Tank Project.

[20] October 14, 2006 memorandum from Mr. Marchesani (APSC) to Mr. Moore (APSC).

In response to the concerns raised on the use of the wrong welding procedure to create the door sheet weld in Tank 55, APSC responded:

> *The Alyeska Welding Engineer reviewed and approved all of the WPS's [weld procedure specifications] provided by the tank implementation contractor (TANCO Engineering, Inc.). In all cases, these WPSs were qualified in accordance with Section IX of the ASME Code. Following completion of his review, the Alyeska Welding Engineer stamped the WPSs approved and provided these approved WPSs to the Project Engineer for retention in the project file. The procedure applies to all WPSs for Tanks 5, 55, and 93.*

In response to concerns about Tank 55 repair integrity, APSC responded that the repairs made to Tanks 5 and 55 were limited to bottom plate replacement as defined by 10.3.1.2. The repairs were designed by Anvil Engineering, Corporation – an Alaskan engineering firm experienced in tank design and the API standards. Furthermore, the repair designs were stamped by a Professional Engineer licensed to practice in the state of Alaska and reviewed by Alyeska Facility and Welding Engineers maintaining active API 653 certifications.

October 16, 2002
APSC responds to ADEC stating:

> *Now that we have reviewed the issues raised and have developed our responses, we are confident that the work on these tanks was appropriate and consistent with applicable codes. As a result, we plan to begin re-commissioning Tank 55 this Friday, October 18, with the work to be completed Saturday, October 19.*

November 1, 2002
ADEC records contain recommendations for Tank 55 by the ADEC engineer; however, this document is withheld by ADEC under a deliberative process claim.[21]

November 4, 2002
Mr. Harrison (JPO) faxes Tank 55 welding procedure documents to Mr. Saengsudham (ADEC) for review.

November 16, 2002
Mr. Stevens (KAM Inspector) signs off UNSAT#19 the incorrect welding procedure documented by Inspector Kale two months ago. Inspector Stevens notes the APSC Welding Engineering Department reviewed it and approved the welding procedure.

Unsatisfactory Finding No. 22 (UNSAT#22) for a faulting coating on a 16" drain valve was over-turned by APSC engineering.[22]

[21] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[22] November 16, 2002 memorandum from William Mott (APSC) to Clifford Moore (APSC), Resolution of Project X-052 Unsat #22.

November 19, 2002
APSC responds to JPO request for a list of all the unsatisfactory conditions found by inspectors on the VMT Tank Program. APSC provides a list of only four (4) unsatisfactory conditions on the log that they submit to Mr. Harrison (JPO).[23] APSC shows that all unsatisfactory findings were resolved. UNSAT#20 for Tank 55 is not listed in this document.

November 21, 2002
APSC sends letter to JPO providing a copy of the original and revised welding procedure qualification requirements [PQRs].[24]

November 26, 2002
Tank 55 was returned to diesel service.[25]

December 20, 2002
APSC letter to ADEC confirms Tank 55 has been returned to service.[26]

April 4, 2003
ADEC letter to APSC lists concerns with Tank 55 welding procedures: [27]

> *…the department is writing this letter to express concerns regarding the welding of the door sheet in Tank 55…we are greatly concerned about the quality control provided during the project, specifically by APSC's implementing contractor (TANCO Engineering, Inc.), as it does not appear the intent of Section IX of the ASME Code, as implied in API Std 653 and referenced by API Std 650, was being followed….*
>
> *Additionally, we believe that, according [to] the WPS TG-400-3G-1 (Rev 5) and its associated Procedure Qualification Report (PQR) T-400-6G-1Q, heat input is considered a supplemental essential variable. Heat input can be calculated from the (welding) Travel Speed, Amperage, and Voltage. However the WTR does not have any records of the parameters for two vertical welds: FW-4 and FW-8. It is not indicated how the heat input was monitored for the vertical welds for TK55."*
>
> *A review of the records indicate that approved Welding Procedure Specifications (WPS) were generated **after** the door sheet welding had begun. We hope that you agree with us that your response indicates that WPSs need to be reviewed and approved for compliance with Section IX before starting of the corresponding welding. We believe that this is the*

[23] November 19, 2002 Letter from Rod Hanson to Willie Harrison (JPO), VMT Tank Program – Inspection Documented Unsatisfactory Conditions.
[24] October 21, 2002 letter from Rod Hanson (APSC) to William Harrison (JPO), VMT Tank Program- Procedure Qualification Records (PQR) T-400-3G-1Q and T-400-6G-1Q
[25] June 21, 2006 e-mail from Sharon Marchant (APSC) to Susan Harvey (Harvey Consulting, LLC.), TK-5 and TK-55 Recommissioning Dates.
[26] December 20, 2002 letter Rod Hanson (APSC) to Bonnie Friedman (ADEC), Planned internal crude oil inspection cycle – Valdez Marine Terminal.
[27] April 4, 2003, letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Storage Tank Welding Activities for Tanks 5, 55, and 93, Valdez Marine Terminal.

fundamental intent of Section IX: to ensure that, before any welding can start, an appropriate WPS is prepared to provide direction for making production welds to the ASME Code requirements." [emphasis in original ADEC document].

April 21, 2003
ADEC sends a draft letter entitled "review of employee concerns on tanks 5, 55, and 93" to APSC for review before it was issued on April 24, 2003.[28]

April 25, 2003
ADEC sent APSC a letter closing out four of the (6) Tank 55 allegations listed in their letter.[29] ADEC substantiated portions of two concerns relating to welding of the door sheet (procedure for welding, and quality control during welding).

No enforcement action is taken by ADEC. The agency merely says they will provide greater scrutiny on the 2003 tank inspection and repair program. The agency appeared to be silent on whether it assessed the substantiated allegations may pose an oil spill risk.

May 10, 2006
Chuck Hamel submits a letter to PWSRCAC alleging unsafe conditions from some of the tanks repaired in year 2002. Mr. Hamel's initial letter focuses on Tanks 5 and 16, but expands in later correspondence to include Tank 55.

May 12, 2006
APSC responds to PWSRCAC's inquiry about Tank 5 and 16 allegations, and mentions that two concerns were validated by ADEC on Tank 55, which was also repaired in 2002.[30]

May 16 & 18, 2006
Mr. Hamel was not satisfied with APSC's May 12, 2006 response, and encouraged PWSRCAC to complete a Tank 55 investigation.

May 18, 2006
PWSRCAC internal memo summarizes meeting with JPO on Tank 55 allegations. Joe Hughes (JPO) said he had looked into the Tank 55 concerns and found that an API Inspector from TANCO was at the VMT when the Tank 55 door sheet weld was completed. The inspector stopped work on the door sheet because procedures were not being followed, the APSC welding engineer re-wrote Alyeska's procedures and the inspector approved them as meeting the API 653 standard. Mr. Hughes also said there are two federal investigations looking into this issue (EPA and FBI); therefore, he is unable to release information in the investigation file. Mr. Hughes said that according to JPO, Tank 55 is the only tank in question from the 2002 tank inspection and repair program.

EPA and FBI investigation underway

[28] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.
[29] April 25, 2003 letter from Ms. Friedman (ADEC), to Mr. Shoaf (APSC), Review of Employee Concerns, Inspections of Tanks 5, 55, and 93, Valdez Marine Terminal.
[30] May 12, 2006 letter from Tom Stokes (APSC) to Stan Stephens (PWSRCAC), Chuck Hamel letter of May 10, 2006.

June 12, 2006
Mr. Lockman, Alaska Testing Institute reads the radiographs of the Tank 55 door sheet welds and finds film quality and weld quality to be within the code acceptance standards required, but suggests a visual inspection to resolve anomalies in the radiographs associated with the original welds made in the tanks when the tank was built in 1976.[31]

June 13, 2006
APSC assembles an investigation team to study the allegation at the direction of APSC President, Kevin Hostler. The team concludes the door sheet welding procedures for a 0.625" thick tank and a 0.316" thick tank are essentially equivalent, except for maximum permitted heat input. Equivalence cannot be established unless in-process weld variables can be used to show that the lower maximum heat input had not been exceeded. APSC prepares a summary table comparing the two welding procedures for emphasis.[32] However the heat input data that was collected in 2002 is incomplete and suspect by some.

June 14, 2006
Harvey Consulting, LLC. reviewed Tank 55 inspection and repair records at APSC's Anchorage Office.

June 19, 2006
ADEC responds to PWSRCAC's Tank 55 record request. ADEC reports Tank 55 inspection, welding and repair issues were investigated by ADEC in 2002-2003. ADEC records show two Tank 55 allegations were substantiated by ADEC in April 2003.substantiate Tank 5 concerns raised by employees working at the VMT. ADEC withheld documents from PWSRCAC citing confidentiality based on attorney client communication or deliberative process.[33]

June 20, 2006
Harvey Consulting, LLC. reviewed Tank 55 inspection and repair records at APSC's Anchorage Office.

July 3, 2006
APSC issues a report stating:

> *It is acknowledged there was no documented technical acceptance from the Alyeska welding engineer who made the decision that welding completed for the 0.316-inch shell thickness was acceptable*."

APSC's report also states that their own standards do not require in-process data to be collected on every weld, and they state that API 650 and 653 does not require it at all. There is no comment on ASME or other industry welding standards. APSC argues that it had collected data on most of the interior door sheet welds (but not vertical field welds (FW-4 and FW-8)) and did not obtain data on

[31] Record reviewed at June 2006 Tank 55 record review at APSC's office. Information from notes taken by Harvey Consulting, LLC.
[32] June 13, 2006, APSC internal investigation report prepared for APSC President, Kevin Hostler, was provided for PWSRCAC to read and take notes from at the June 14, 2006 record review; all copies were collected by APSC.
[33] June 19, 2006 letter from Commissioner Fredriksson (ADEC) to John Devens (PWSRCAC), Public Record Request, Valdez Marine Terminal Tanks 5, 16, 55, and 93.

the outside welds; however, this was deemed to be sufficient random testing according to APSC's standards.

APSC report goes on to say:
In accordance with Alyeska Surveillance/Repair Procedure – TM-1 (8/8/02) the extent of examinations was: "Perform welding and visual in-process examinations on a random basis. "Even though no in-process information was documented for all the outside welds and inside weld segments FW-4 and FW-8, the in-process information that does exist is sufficient to verify that compliance to the WPS was met for a sufficient portion of the welding to meet the extent of in-process examination required by TM-1. TM-1 requires visual in-process examination on a "random basis." There was no requirement in API 650 or API 653 for in-process inspections of welding.

August 2006 (various dates)
Ms. Harvey (Harvey Consulting, LLC) interviewed Mr. Harrison (JPO). Mr. Harrison confirmed employee concerns were reported to JPO and ADEC on Tank 55. The main concerns included use of incorrect welding procedures, lack of quality control during welding, and other tank inspection findings identified by the inspectors which were not remedied prior to returning the tank to service.

Ms. Harvey interviewed employee(s) that worked on VMT 2002 tank inspection and repair work who alleged the Tank 55 welding procedures and quality control were significant issues. Confidentiality was requested due to fears of retaliation for speaking about what happened on Tank 55 in 2002.

Ms. Harvey requested to meet with APSC Engineer (Tony Balowski) and KAM Inspector (Mike Stevens) to discuss Tank 55 and review engineering records on the allegations. Requests for meetings were denied by APSC.APSC insisted that communications between PWSRCAC and APSC's Engineer and KAM Inspector be conducted in writing using questions acceptable to APSC, and review by APSC Management.

Ms. Harvey made a request to meet Bonnie Friedman (previous ADEC employee), Sam Sangsudam (ADEC) and Becky Lewis (ADEC). Requests for meetings were declined.

August 30, 2006
On August 30, 2006, Ms. Lewis wrote to Ms. Harvey, copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses:

ADEC declines meeting and records on Tank 55 due to current state investigation

This email is in response to your request this afternoon that Sam Saengsudham and I meet with you on Friday, September 1, 2006 to discuss PWSRCAC's investigation into the Chuck Hamel allegations made in May of 2006 concerning several tanks at the Valdez Marine Terminal (VMT). We have decided not to meet with you at this time. There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.

October 30, 2006
On October 30, 2006, Mr. Jones (APSC Vice President) sent to PWSRCAC Board President additional information provided by the APSC engineering team on Tanks 55, and 16 in response to PWSRCAC's preliminary findings.[34] The Tank 55 response confirms that APSC engineers are still confident about the integrity of the door sheet weld, and are not concerned about the quality of the material used to replace the tank floor.

Analysis of Allegations

ADEC's April 25, 2003 Findings Document lists six (6) employee concerns raised on Tank 55 during the 2002 Tank Project. Each of the six concerns raised is directly quoted from the ADEC April 25, 2003, Findings Document in quotations below, with a summary of ADEC's findings, and a brief recommendation for how PWSRCAC might proceed.

ADEC investigated Six (6) Tank 55 concerns

Four Additional Concerns Found in Records

In addition to the six (6) concerns documented in ADEC's April 25, 2003 Findings Document, the records reviewed identified four (4) additional issues raised by inspectors and employees for a total of 10 concerns.

Four (4) addition concerns found in Tank 55 records

Allegation No. 1 – Door Sheet Welded with Wrong Procedure

Concern: "Welding of the door sheet: the initial WPS [welding procedure specification] was not correct because it was based on a PQR [procedure qualification record] of thickness beyond the range allowed by ASME Code. The WPS [welding procedure specification] was subsequently changed after some vertical welds had been completed."

ADEC Finding:[35] Portions of this concern have been substantiated.

> *Portions of this concern have been substantiated. Please see excerpts below from ADEC letter to Mr. Shoaf dated April 4, 2003.There are some inconsistencies between the approved WPS's and the Weld Tracking Report (WTR). Although the WPS's, T-400-2G-1 (Rev 3) and TG-400-3G-1 (Rev 5), have approval dates of 9/20/02 and 9/18/02, respectively, the WTR shows an initial completion and inspection of the welds on 9/17/02. The WTR further contradicts itself by specifying the aforementioned WPS's (as procedures used) which would not have been approved until at least one day later (9/18/02).* ***We are concerned about***

[34] October 30, 2006 e-mail from Greg Jones (APSC) to Stan Stephens (PWSRCAC), Responses to PWSRCAC's Questions.
[35] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

> ***inspections (and documentation) of welding that have WPS's approved afterward.*** *To elaborate further, records indicate that the welding on the door sheet of TK55 started on 9/16/02. Pages 1 and 2 of the WTR indicate all initial welding were completed by 9/17/02. However, the WPS's, which were indicated in the 9/17/02 WTR as procedures used for the welds, were not approved by APSC's welding engineer until 9/18/02 and 9/20/02- up to two days after the welding had started on the door sheet.[emphasis added]*

Analysis:

In 1998 TANCO Engineering Inc. (TANCO) was awarded the VMT tank maintenance and repair contract. To qualify as the VMT welding contractor, TANCO prepared welding test panels and procedure qualification requirements (PQRs) to demonstrate their ability to weld VMT tanks. TANCO and APSC developed two welding procedures[36] for diesel storage tanks of 0.312" thickness, and two welding procedures for crude oil storage tanks of a 0.625" shell thickness. The diesel tank welding procedures approved in 1998 were not the same as crude oil tank welding procedures. Tank 55 is a diesel storage tank with a 0.316-inch shell thickness. In 2002, welders should have welded the Tank 55 door sheet with the diesel tank welding procedure; but they did not. Instead the welders were provided a copy of the crude oil tank welding procedure for a thicker walled tank (0.625-1.25 inches) and it was used for many of the Tank 55 welds.

A portion of the Tank 55 door sheet was welded with wrong procedure

During the summer of 2002, a hole was cut into the shell of Tank 55 to replace the corroded tank floor. A 12.5' by 13.5' hole was cut, and was later welded shut, after Tank 55's floor was replaced. The metal used to cover the hole is called a "door sheet." A substantial portion of Tank 55's door sheet was welded on the tank using the wrong welding procedure, until an inspector found the problem, and reported it. The wrong welding procedure was used to make all the external door sheet welds and the two vertical welds inside the tank (Field Welds No. 4 and 8). The correct welding procedure was used to complete the remaining inside welds. The tank inspector was concerned about the quality of vertical field welds (FW-4 and FW-8) and all the external door sheet welds, because, these welds were made using the wrong procedure. The inspector was also concerned that there was no heat input data collected on these welds. The inspector pointed out that heat input monitoring was required by the 1998 TANCO welding procedure specifications to ensure the existing tank metal along side the new weld was not adversely impacted by welding heat that exceeded the metallurgical standard.

Both APSC and ADEC substantiated Allegation No. 1

ADEC confirmed the problem did occur, but did not report their finding until five months after the tank was returned to service. ADEC did not require the tank to be re-inspected or repaired. APSC discounts the allegation as true but inconsequential from

[36] vertical and horizontal welding procedures

an integrity standpoint. APSC maintains the diesel tank and crude oil tank welding procedures are sufficiently similar with respect to the welding parameters, and tank integrity can be assured by data collection on only a few welds, rather than data collection on 100% of the welds.

On October 30, 2006, Mr. Jones (APSC Vice President) sent PWSRCAC additional information provided by the APSC engineering team on Tanks 55, and 16 in response to PWSRCAC's preliminary findings.[37] The Tank 55 response confirms that APSC engineers are still confident about the integrity of the door sheet weld, and are not concerned about the quality of the material used to replace the tank floor.

> ***Question 1:*** *We understand this question to mean: Is there documentation to show that the maximum heat input specified in the revised welding procedure used for welding of TK-55 door sheet was not exceeded?*
>
> ***Response:*** *A Weld Tracking Report (WTR) completed by a qualified welding inspector recorded welding parameter information (Amperage, Voltage, Travel Speed) to calculate the heat input for portions of the door sheet horizontal and vertical seam welds. Heat input is calculated by the following equation: (Voltage x Amperage X 60)/Travel Speed. Example: (24 Volts x 115 Amps x 60)/4 Inches Per Minute = 41.4 KJ/in.*
>
> *Heat input for welds FW-1, FW-2, FW-3, FW-5, FW-6, FW-7, FW-9, and FW-10 calculated from the recorded in-process welding parameters ranged from a low of 27.6 KJ/in. to a high of 32.2 KJ/in. These heat inputs did not exceed 46.8 KJ/in specified in the welding procedures used for TK-55 door sheet welds, nor the lower heat input of 40.8 KJ/in. that should have been the maximum limit, if the welding procedures had been revised accurately.*
>
> *A comparison of the welding parameters for installing TK-55 door sheet with those recorded for TK-5 door sheet, which was a thicker material, showed that the welding parameters were comparable. Therefore, the heat inputs were similar which supports that TK-55 and TK-5 door sheets were welded using the original (TK-5) and revised (TK-55) welding procedures the same way without exceeding the heat input maximum.*

Of note, APSC's response does not address four important portions of this allegation.

First, some allege the heat input data that was captured for 40% of the door sheet welds, may be unreliable. Record tampering has been alleged, because data is not consistent with the variability in weld tracking data for this type of job.

Second, there does not appear to be any 2002 engineering records showing these computations were made prior to returning Tank 55 to service.

[37] October 30, 2006 e-mail from Greg Jones (APSC) to Stan Stephens (PWSRCAC), Responses to PWSRCAC's Questions.

Third Mr. Harrison (JPO) maintains he recommended a simple test of the heat affected zone to ensure tank integrity prior to returning Tank 55 to service. This test was not done. There has not been a satisfactory explain why.

And fourth, APSC's own tank inspection procedures required weld tracking data to be obtained:

> *Inspector requirement #3 in Work Order Package 32001526 states the KAM Inspector must "verify that the welders performing the work and certified WPSs used are in accordance with the requirements of the SPR TM1 WER."*[38]

Author's Note: SPR TM1 WER is an APSC engineering specification for the 2002 Tank Project.

> *Inspector Kale writes in the inspection log:*[39] *"[A]fter reviewing the procedures for the welding of the vertical and the horizontal welds of the door sheet it was discovered that the minimum base metal thickness was .625"and the tank shell thickness is .3125. Per ASME [American Society of Mechanical Engineers] this is an essential variable which can't be changed w/o [without] doing a new procedure Ref WPS T-400-2G-1 Rev2 &T-400-3G-2 Rev3"*[40]

Record Review: APSC's Tank 55 records confirm this allegation was substantiated.

On September 16, 2002, KAM Inspector Mr. Kale lists an Unsatisfactory Condition No. 19 (UNSAT #19). Mr. Kale's hand written notes in the Tank 55 records state:

> *UNSAT #19 was submitted because door was welded out using wrong procedure for the 3G & 4G.*

Author's Note: Mr. Kale was laid off by Kakivik Asset Management, in October 2002. Mr. Kale filed a lawsuit against Kakivik Asset Management, claiming wrongful discharge, due to raising inspection concerns to management and the agencies. Mr. Kale settled with Kakivik Asset Management out of court for an undisclosed amount of money. Mr. Kale also filed a complaint with the U.S. Department of Labor about the 2002 Tank Project.[41]

[38] Data obtained by Harvey Consulting, LLC. during Tank 55 record review at APSC's office in June 2006.
[39] Work Order Package 32001526 p.63. "Tank 55 Unsat #19 Bryce Kale VC6126 09/16/02; notes taken by Ms. Harvey at APSC offices. APSC would not allow Tank 55 records to be copied.
[40] Notes taken at June 14, 2006 record review at APSC offices. Notes taken by Ms. Harvey at APSC offices. APSC would not allow Tank 55 records to be copied.
[41] Mr. Kale did file a U.S. Department of Labor complaint against Kakivik Asset Management, Inc. He was represented by attorneys from the Government Accountability Project. The complaint is found at Kale v. Kakivik Asset Management Inc., 2003-TSC 4 and 5 (ALJ Sept. 17, 2003), and was argued before Administrative Law Judge (ALJ) William Dorsey. ALJ Dorsey summarized Mr. Kale's complaint in his September 17, 2003 decision document:

> *" As a quality assurance inspector of oil tanks in the Valdez Marine Terminal in Valdez, Alaska for the Alyeska Pipeline Service Company, Complainant was an employee of Kakivik Management, Inc., which had contracted with Alyeska to perform quality assurance inspections.* ***He alleged he was laid off on October 13, 2002 in retaliation for reporting to the Alaska Department of Environmental***

Author's note: another Department of Labor complaint which was filed against Kakivik Asset Management Inc. (KAM) and Alyeska Pipeline Service Company on August 8, 2002, by Denis Vamvoras. The case against KAM is titled Vamvoras v. Kakivik Asset Management Inc., Case 2003-WPC-00004. This case was argued before Administrative Law Judge (ALJ) Larry Price.

Exactly two months later, on November 16, 2002, after Mr. Kale had been laid off from the 2002 Tank Project, another KAM Inspector, Mr. Stevens, signed off UNSAT#19 as satisfactory in the Tank 55 inspection files. Mr. Stevens wrote:

> *Welding engineering responded to the unsat condition by explaining that what took place on the door sheet actually did meet the requirements of the specifications.*

The UNSAT#19 was not cleared by Mr. Stevens until after the Joint Pipeline Office (JPO) inquired about the integrity of Tank 55's welds. The week of November 12, 2002, Mr. Harris (JPO) requested records on Tank 55. On November 16, 2002, only three days prior to APSC's written response to JPO, Mr. Stevens cleared UNSAT#19.[42]

On November 19, 2002 APSC provided a written response to JPO's Tank 55 inquiry. On November 26, 2002 Tank 55 was returned to service at 2:30pm.[43]

APSC's Engineering Department records were not included in the Tank 55 files, which were made available for PWSRCAC review, with the exception of the Performance Qualification Records (PQR) for 1998 and 2002. The 1998 Performance Qualification Record (PQR) showed **four** different welding procedures were developed to repair tanks at the Valdez Marine Terminal:

1. horizontal welds in a thicker walled (0.625"-1.25") crude oil tank shell [WPS No. T-400-2G-1];
2. vertical welds in a thicker walled (0.625"-1.25") crude oil tank shell [WPS No. T-400-3G-1];
3. horizontal welds in a thinner walled (0.312") diesel tank shell [WPS No. not available to author]; and
4. vertical welds in a thinner walled (0.312") diesel tank shell [WPS No. not available to author].

Conservation and to the Federal/State Joint Pipeline Office of Alaska *that oil may be seeping into the ground from faulty repairs of oil storage tanks." [emphasis added]*

"Complainant made additional claims of employment discrimination which he contends occurred after his ***October 13, 2002 layoff,*** *when Employer did not re-hire him during the 2003 Alaskan inspection season." [emphasis added]*

[42] November 19, 2002 letter from Rod Hanson (APSC) to William Harrison (JPO), VMT Tank Program- Inspection Documented Unsatisfactory Conditions.

[43] June 21, 2006 e-mail from Sharon Marchant (APSC) to Susan Harvey (Harvey Consulting LLC), providing the dates Tanks 5 and Tank 55 were returned to service.

Four days after the welding problem was found on Tank 55 the Performance Qualification Record (PQR) for the crude oil tanks [WPS No. T-400-2G-1 and WPS No. T-400-3G-1] was revised to include the diesel tanks.

Author's Note: It still is not clear why the crude oil tank welding procedures were revised to include the diesel tanks. Four separate tank welding procedures were developed in 1998 for repairing the VMT tanks. It is not clear how four welding procedures can be collapsed down to two procedures in 2002. There was no engineering analysis in the Tank 55 file to support this change.

APSC Re-examines the Weld Procedure Allegation in 2006: The June 13, 2006 APSC internal investigation report submitted to APSC President, Mr. Hostler, responds to the question of whether the WPS used on Tank 55 was inappropriate. The APSC internal report concludes that the wrong welding procedure was used for some of the Tank 55 door sheet welds, but that the incorrect welding procedure was "essentially" equivalent to the one required, and therefore, there is no reason for concern about the weld integrity today.

A direct quote from the report states:

> *Welding was performed without prior approval of an applicable WPS in accordance with the requirements of T-411[44], Section 1.9.1 (1).*

In APSC's July 3, 2006 report entitled 2002 Valdez Tank Project Review, APSC provided an excerpt from T-411 which verifies that APSC's own design standards for repair of the tanks required welding procedures to be in place, and appropriate for the type of tank being repaired prior to making the welds:

> *Contractors must submit WPSs prepared specifically for each joint design to be utilized and supporting procedure qualification records (PQRs) with test dates for Alyeska approval at least 14 workdays before the start of welding. Alyeska will review WPSs and PQRs, and the test results and provide written approval or rejections of welding procedures. Submittals not appropriate for individual weld joint designs to be utilized will be rejected.*

APSC's June 13, 2006 internal report to President Hostler states:[45]

> *It is acknowledged there was no documented technical acceptance from an Alyeska welding engineer that welding completed for the 0.316-inch shell thickness was acceptable. The inspector that identified the incorrect WPSs ultimately accepted the door sheet welds.*
> *9/14/06, welding appears to have been performed*
> *9/16/02 – 9/17/02, welding occurred to complete door sheet reinstallation on Tank 55 using TANCO welding procedure specifications (WPS) T-400-2G-1 and T-400-3G-1. These WPS had a specified base metal thickness range of 0.625-1.25" that did not cover Tank 55 door sheet reported shell thickness of 0.312 inch.It was necessary to revise both*

[44] T-411 is an APSC project specification for the 2002 Tank Project.
[45] PWSRCAC was not allowed to have a copy of the July 13, 2006 report; however, Ms. Harvey was allowed to copy from this report. The section quotes was transcribed by Ms. Harvey from the APSC report.

> *WPS in accordance with ASME Section IX, QW- 403.6 to address their applicability for the thinner 0.316" shell thickness material. Along with the base metal thickness revisions, WPS T-400-2G-1 was revised to include 3/32" diameter E7018-1 electrodes. APSC approval of the revised TANCO WPS T-400-2G-1 (Rev. 5) did not occur until after the welding was completed.*
>
> *A comparison between the revision of WPS T-400-2G-1 and T-400-3G-1 indicated that all essential and supplemental essential variables as defined by ASME Section IX, QW-253 were the same, except for the maximum heat input limitation and additional material group information. The maximum heat input should have been 6,000 J/in. lower in the revised WPSs for the base metal thickness range of 0.280-0.560 inches. Also some nonessential variables did differ between the revisions.*
>
> *Without a major change to the essential or supplemental essential variables, welding performed with the original WPS would have been equivalent to welding performed with the revised WPS. An example of a major change would have been a change in the filler metals. Both the original and revised WPS require the use of the same filler metals, E6010 for the root pass and E7018-1 for the fill passes. Without a change in the filler metals it would be expected that the weld metal would have the same mechanical and notch toughness properties when following the same welding parameter ranges (e.g. amperage, voltage, travel speed, etc.) specified in the original or revised WPS. The welding that occurred met both the requirements of the original and revised WPS.*
>
> *Our conclusion is that some technical discrepancies occurred; sufficient data exists to safely conclude that no integrity concerns exist today. For example, welding was performed before an appropriate procedure was put into place. Nevertheless, had the proper procedure been in place when the welding was performed, the welding that occurred would not have been done differently.*

Overall, the APSC internal report concluded that the wrong welding procedure was used for some of the Tank 55 door sheet welds, but that the incorrect welding procedure was "essentially" equivalent to the one required, and therefore, there is no reason for concern about the weld integrity today.

Questions posed to APSC personnel*:* During the June 14, 2006 records review at APSC's office, a number of questions were posed by Ms. Harvey to Mr. Kattness (APSC) and Mr. Beckett (APSC).

Ms. Harvey pointed out the Tank 55 inspection records looked unusual since the November 2002 changes and ultimate close-out determinations were well beyond the dates of the actual inspection timeframe, which were August – September 2002. Ms. Harvey asked why there was such a long time lag, more than an additional month, in completing this inspection and returning this tank to service. Mr. Kattness (APSC) and Mr. Beckett (APSC) did not know why Mr. Stevens (KAM) changed UNSAT #19 (unsatisfactory inspection item number 19) to "satisfactory" two months after the inspection was complete.

Ms. Harvey explained that it looked unusual to have an inspection report with unsatisfactory welds reported by Mr. Kale, the API-653 authorized inspector, and then to have another inspector, Mr. Stevens, determine the welds to be satisfactory several months later with no documentation regarding the decision- making process used in removing the unsatisfactory inspection findings. Mr. Stevens noted that "Welding Engineering" said it was satisfactory to close-out this unsatisfactory welding procedure issue. However Ms. Harvey could not locate a 2002 APSC "Welding Engineering" analysis to support closing out UNSAT#19.

Ms. Harvey asked when Tank 55 was returned to hydrocarbon service. Ms. Harvey requested a copy of operational data to verify the date of service. Ms. Marchant sent an e-mail on 6-21-06 confirming that Tank 55 was filled with diesel and returned to service November 26, 2002, at 2:30pm.

Mr. Beckett and Mr. Katness were unable to provide a copy of any 2002 document from the APSC Engineering Department documenting how they came to the conclusion in 2002 that the welds were satisfactory before returning Tank 55 to hydrocarbon service. However, APSC did provide access to view the records compiled by the 2006 APSC internal investigation team, which attempted to recreate what actually happened in 2002 on this issue. For example, Mr. Katness provided a 2006 e-mail in which he asked Mr. Balowski to explain why it took until November 2002 for the Tank Inspection Company KAM, and Inspection Supervisor, Mr. Stevens, to resolve this unsatisfactory inspection item.

Mr. Balowski responded:

> *Mike [note Mr. Stevens goes by the nickname Mike] urged him several times to 'sat' these and Bryce [Mr. Kale] never would because they disagreed. Mike probably could have taken supervisory action earlier.*

Ms. Harvey inquired where Mr. Kale is working. APSC confirmed Mr. Kale was not working for Alyeska or Kakivik Asset Management, and it was thought he had left Alaska.

Ms. Harvey inquired about Mr. Stevens, and was told that he is still employed at Kakivik Asset Management in Valdez. Kakivik Asset Management still provides inspection services for APSC. Mr. Stevens still works at the Valdez Marine Terminal on contract to APSC as a Kakivik Asset Management employee.

Author's Note: Ms. Harvey spoke briefly with Mr. Stevens on the phone June 22, 2006. He said 2002 was his first year of employment with Kakivik Asset Management, and prior to that time he was employed on the North Slope at Kuparuk. Mr. Stevens confirmed that he was Mr. Kale's supervisor during the fall of 2002. Mr. Stevens never mentioned that in 2002 he was laid off from the 2002 Tank Project by APSC and took a job at KAM in Valdez on the same VMT Tank Project; this information was provided to the author by another source. This information should be verified with APSC.

Mr. Beckett (APSC) and Mr. Annette (APSC) explained the work environment was very tense on the 2002 inspection and repair project. According to Mr. Annette and Mr. Beckett, Mr. Kale and Mr. Stevens did not get along. There was constant friction between Kale, Stevens, and Lane

(another KAM Inspector). Mr. Annette said the inspection companies ran up inspection costs that exceeded the amounts budgeted for them. When APSC tried to control the inspection costs, the inspectors would claim harassment, or that APSC was trying to circumvent standards and procedures.

In Mr. Annette's opinion, the costs associated with the 2002 tank work and worker conflict issues spiraled out of control, ultimately ending up in a whistleblower complaint being filed with the Alaska Department of Environmental Conservation (ADEC). According to Mr. Beckett, the ADEC investigation revealed that there were some procedural anomalies in the 2002 Tank Project; however, ADEC found no integrity issues, and the case was closed in early 2003.

Ms. Harvey asked if JPO engineers assisted on the ADEC investigation. Ms. Marchant (APSC) responded that ADEC took the lead in responding to the employee concerns, and JPO provided some support. Ms. Harvey requested to review the 2002 APSC investigation; these records were not provided for review.

Ms. Marchant explained that APSC provided extensive records to ADEC in 2002 and cooperated fully with the ADEC and JPO investigation. Additionally, Ms. Marchant stated APSC spent over 800 man-hours to investigate these same concerns again in 2006. Ms. Harvey asked Ms. Marchant why it took 800 man-hours to answer APSC President's questions in 2006 if the 2002 Tank Project had thoroughly investigated by APSC and the agencies in 2002, and closed out in 2003. Ms. Marchant did not answer.

According to Dr. Kuckertz (P.E., PWSRCAC staff) a June 1, 2006 meeting was held between APSC and PWSRCAC. APSC explained to PWSRCAC staff members, Tom Kuckertz and Stan Jones, this allegation, while substantiated, resulted from an honest error that developed because the engineering team never expected to have to replace the floor on Tank 55 and consequently did not include a door sheet welding procedure in project planning beforehand. When it was determined that the floor needed to be replaced, the Tank 5 door sheet welding procedure was handy and was inadvertently used on Tank 55. Following up on this explanation, Ms. Harvey asked Mr. Beckett (APSC) about the data listed in the Tank 55 inspection file. Ms. Harvey pointed to the welding procedure approval date for the "tank door sheet removal and replacement welding/NDE/ pressure testing project" in the Tank 55 inspection file of March 26, 2002. Ms. Harvey said the Tank 55 records of the door sheet procedure preparation and approval of March 2002, was inconsistent with the explanation being given. Ms. Harvey questioned why APSC had concluded that there was no door sheet procedure in place for Tank 55 prior to September 20, 2002, when the ISR vc2415-103 record showed that a door sheet removal and welding procedure was indeed actually prepared and approved by APSC on March 27, 2002? Why would a door sheet welding procedure have been prepared and approved in March 2002 if no door sheet was anticipated?

Author's Note: Although PWSRCAC was not allowed to photocopy any records from the Tank 55 inspection file, Ms. Harvey did hand copy down this information found in the re-created Tank 55 file shown below.

58-TK-55 Diesel Storage Tank

ISR No.	ISR vc2415-103
Dates of inspection:	8/10/02 through 9/20/02
WO/Project/FAR# X052-32001526	Tank door sheet removal and replacement
	Welding/NDE/pressure testing
Procedure date approved:	3/27/02
Procedure Preparer:	Joseph M. Stevens
Procedure Approver:	Tony Balowski
Responsible Manager:	Cliff Moore
Contractor Rep.:	Brian Tibbett
Inspection Company:	Kakivik Asset Management, Inc.
Inspection Records Review & Acceptance:	J.D. Whitaker (11/20/02)
Inspector:	Bryce Kale Joseph M. Stevens (was added below Mr. Kale's name in a different color pen)

Author's Note: Mr. Stevens was employed by APSC in March 2002. Some time during the summer of 2002, Mr. Stevens took a position with Kakivik Asset Management as an inspector. It appears that Mr. Stevens specified the incorrect door welding procedure for Tank 55 while working for APSC in March 2002, and then later over-turned the unsatisfactory inspection finding as KAM Inspector which found that the wrong welding procedure was specified and used on some of the Tank 55 door sheet welds. This sequence of events raises concern about Mr. Steven's ability to be objective about potential errors in his own work. The same conflict may have occurred for Mr. Balowski, who appears to have approved an incorrect welding procedure in March 2002, and then revised the welding procedure qualification requirements in September 2002 to account for use of the crude oil tank welding procedure on a diesel tank after the welds had been completed.

Interview with Mr. Harrison (JPO): Mr. Harrison was interviewed in 2006. He confirmed the Tank 55 door sheet welds were made with the wrong weld procedure. This allegation was substantiated. Mr. Harrison explained the purpose of developing a Performance Qualification Record (PQR) is to weld a test panel using the proposed welding procedure and the exact type of material from the tank. He emphasized the welding travel speed is very important. The test panel is then run through a series of nondestructive and destructive tests to ensure the welding materials and procedure develop a solid, reliable weld. Once a welding procedure is proven effective, welds made using this procedure must stay within the parameters used when the test panel was made. There were four different PQRs developed for the VMT tanks, a vertical and horizontal PQR for the thicker walled crude oil tanks, and a vertical and horizontal PQR for the thinner diesel storage tanks. Mr. Harrison said the fact that there were four different PQRs means

that the welding procedures are not interchangeable, or there would just be one procedure rather than four separate and distinct procedures. The VMT storage tanks have different sidewall thicknesses, therefore, the amperage, voltage, and travel speed used to develop a test weld must be closely followed when the repair weld is completed. Mr. Harrison said ADEC substantiated this allegation, but did not take any action to test the weld that was completed using the wrong welding procedure.

Mr. Harrison explained that without quality control records to verify the amount of heat that was put into the Tank 55 door sheet weld, the quality of the weld and the potential damage to the heat affected zone around the weld could not be determined by visible examination or radiography. Mr. Harrison explained that a radiograph of the weld looks at the quality of the weld itself and does not examine the "heat affected zone" (about 1-1.5" of the original tank metal) joined by the weld. If the weld is made too slowly, too much heat can be put into the weld and can cause the heat affected zone to be brittle and fail. He said a weld radiograph only verifies the quality of the weld itself by looking for lack of fusion, oxidation inclusions, porosity or cracks, etc. A radiograph will not verify the integrity of the heat affected zone; a hardness test is required.

Since the quality control records to verify the amount of heat put into the Tank 55 door sheet weld were in question, Mr. Harrison recommended a hardness test be completed, using a tool that is run along the metal weld. This test takes a few hours to run if the tank is cleaned and empty. This test would not have posed a significant delay in APSC's schedule, and would have provided very valuable information. Mr. Harrison was disappointed that ADEC did not require this test before allowing the diesel tank to be returned to service.

Author's Note: Weld Hardness is defined as: "Weld hardness is an overall control limit that is an indication of the maximum stresses in the weld and heat affected zone. The deposited weld metal for steel tanks constructed of moderate-strength steels should generally not exceed 95-ksi tensile strength, and this is related to weld hardness. Excessive hardness can cause cracking in some services. Weld hardness measurements are often used to determine the effectiveness of the PWHT [preweld heat treatment] where required by the API standards. Hardness is typically taken with a portable unit such as a Telebrineller, because it is easy to use, simple to operate, and accurate. A typical hardness limit specified is 200 BHN maximum for carbon steel tanks. A requirement to check welds is often specified. They are made by automatic weld processes because the weld chemistry and thus material properties can be adversely affected by improper flux-wire combinations. [46]

Findings

1. Mr. Stevens (APSC employee at this time) and Mr. Balowski (APSC) approved a door sheet welding procedure for Tank 55 on March 27, 2002. This procedure appears to have specified the wrong welding procedure for a diesel tank shell repair.
2. APSC's records for Tank 55 confirm that on September 16, 2002, Mr. Kale (KAM Inspector, found some of the door sheet welds were completed using the wrong welding procedure. Mr.

[46] Above Ground Storage Tanks, Philip E. Meyers, 1997.

Kale found the outside welds and inside weld's vertical field welds (FW-4 and FW-8) on the Tank 55 door sheet were completed without in-process welding information.

3. Mr. Balowski (APSC) approved a revision to the crude oil tank welding procedure to include thinner walled diesel tanks.
4. Mr. Stevens (KAM Inspector at this time) over-turned Mr. Kale's unsatisfactory finding allowing the tank to be returned to service in November 2002, after KAM had remove Mr. Kale from his position.
5. Mr. Harrison (JPO) recommended the welds in question undergo a hardness test before returning the tank to service. No records of this test being completed were made available to PWSRCAC.
6. ADEC records do not show any additional weld testing was required, as recommended by JPO. ADEC does not address whether the code violations increase the risk of an oil spill.
7. No records were provided to PWSRCAC showing any evidence that the welds were tested or removed; indicating the September 16, 2002 welds put into place are still in place.
8. ADEC issues a letter stating it is the agency's understanding that APSC will not put Tank 55 back into service until the agency's investigation is complete.
9. APSC puts Tank 55 back into service on November 26, 2002, but ADEC does not issue its inspection findings until over four (4) months later on April 4, 2003.
10. On April 4, 2003 ADEC confirms the Tank 55 door sheet weld was partially completed using the wrong welding procedure. ADEC confirms some of the welds do not comply with the ASME [American Society of Mechanical Engineers] Code or API [American Petroleum Institute Standards] Standards; however, ADEC is silent on whether or not there is an increased probability of premature failure of the welds associated with not complying with these standards. ADEC issues a summary of its findings on the tank integrity issues raised on Tanks 5, 16, 55 and 93.
11. No engineering records were provided for PWSRCAC review, except the 2002 and 1998 welding procedures. An interview with Mr. Balowski and record request to review the other Weld Engineering Department documents on Tank 55 was denied by APSC
12. No document was produced by APSC's Welding Engineer to verify the welds were acceptable prior to returning the tank to diesel service; however, in 2006 APSC issues an engineering report, which after the fact attempts to re-create the data that should have been analyzed in 2002 to determine the quality of the welds prior to returning the tanks to service.
13. No findings report is issued by JPO.
14. No enforcement action is taken by ADEC or JPO.

Potential Areas for Additional Investigation

Should PWSRCAC hire a welding expert to provide PWSRCAC with a technical opinion on whether there is a potential risk for a failure of the Tank 55 door sheet weld? Some questions that could be examined include:

1. Is the risk of leaving these welds in place until the next internal inspection in 2012 acceptable? Should the tank be emptied, cleaned and inspected to reduce any unacceptable risk?
2. Is there a way to test the weld integrity from outside or inside the tank to verify the weld integrity without having to replace the door sheet? Would testing be more cost effective than just replacing the door sheet?
3. If the procedures for welding a 0.625" thick crude oil tank and a 0.312" thick diesel tank are essentially the same, then why were there separate procedures developed and approved in 1998 by TANCO Engineering Inc. and subsequently approved by APSC? If they are actually equivalent, why were there 4 different welding procedures written in 1998 instead of one combined welding procedure for all tanks?
4. Is the in-process data collected on the inside welds (except vertical field weld No. 4 (FW-4) and FW-8)) sufficient to conclude that both the inside and external door sheet welds have adequate integrity?
5. What records should be kept to verify the integrity of a door sheet weld? Was this standard of weld engineering inspection documentation met in 2002?

Allegation No. 2- No Heat Input Monitoring for Door Sheet Weld

Was there adequate heat input monitoring to ensure the existing tank shell was not harmed during welding?

Concern: "No heat input monitoring for the door sheet welding."

ADEC Finding:[47] "Portions of this concern have been substantiated. According to the [welding procedure specification] WPS TG-400-3G-1 (Rev 5) and its associated Procedure Qualification Report (PQR) T-400-6G-1Q, heat input is considered a supplemental essential variable. Heat input can be calculated from the (welding) Travel Speed, Amperage, and Voltage. However, the [weld tracking report] WTR does not have any records of the parameters for two vertical welds: FW-4 and FW-8. It is not indicated how the heat input was monitored for the vertical weld[s] for TK 55."

[47] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

Author's Note: Although ADEC concluded that in-process data was only missing from vertical field welds (FW-4 and FW-8), both APSC and Ms. Harvey found that in-process data was also missing from the outside welds.[48]

Analysis: The amount of heat that is used in the welding process impacts the integrity of the weld and the area of tank that is being welded. Too little heat can cause cracking, fractures, or shrinkage stresses on the base metal. Too much heat can affect the hardness of the weld or the heat affected zone. Weld hardness is an indication of the maximum stress in the weld and heat affected zone. Excessive hardness can cause cracking. Hardness can be measured using a portable unit such as a Telebrineller.[49]

Typically the base metal is preheated in cold climates to lower the cooling rate in the weld metal and base metal to produce a more ductile metallurgical structure with greater resistance to cracking, allow hydrogen release without cracking, reduce the shrinkage stresses in the welds and heat affected zone, and raise metal temperature above the brittle fracture level. Preheat can also be used to help ensure specific mechanical properties are achieved such as notch toughness.[50]

The area where the new door sheet and the existing tank meet is called the weld. The area of the existing tank shell next to weld is called the heat affected zone. Heat affected zone is defined as "that portion of the base metal whose structure or properties have been changed by the heat of welding or cutting."[51]

The door sheet welding procedure for a diesel storage tank calls for heat input monitoring while the weld is completed to ensure that too much heat was not put into the existing tank shell metal (this area is called the heat affected zone). Effects of welding on the material surrounding the weld can be detrimental, depending on the materials used and the heat input of the welding process used.

Record Review: A review of APSC's Tank 55 records confirm that some of the welds made in the Tank 55 door sheet did not have heat input monitoring data. Field welds (FW-4 and FW-8 on the inside of the tank) and all the external door sheet welds did have heat input monitoring data to determine how much heat was put in to the weld.

[48] July 3, 2006 Report by APSC, 2002 Valdez Tank Project Review, Appendix I.
[49] Above Ground Storage Tanks, Philip E. Meyers, 1997.
[50] Above Ground Storage Tanks, Philip E. Meyers, 1997.
[51] http://www.engineersedge.com/welding.htm

On September 20, 2002 KAM Inspector, Mr. Kale, lists an Unsatisfactory Condition No. 20 (UNSAT #20). The inspector requirement #6 in Work Order Package 32001526 states the inspector must "verify the preheat requirements of the [welding procedure specification] WPS are followed and closely monitored by the SRP TM 1 Welding Engineering Review and T-411 [APSC Tank Repair Procedures]." Mr. Kale's hand written notes in the Tank 55 records state: "UNSAT preheat because there was not an approved procedure in place while this was being welded."

Heat input data is missing for 60% of the Tank 55 door sheet welds

UNSAT #20 was determined to be satisfactory by Mr. Stevens on September 20, 2002. Mr. Stevens wrote his reason for changing the status of the unsatisfactory finding in the inspection log. Mr. Stevens wrote: "[W]elding procedures were submitted and approved by Alyeska, and in place for the welding of the door sheet." A September 17, 2002 e-mail from inspector Mr. Stevens to inspector Mr. Kale shows Mr. Stevens was advised by Mr. Moore (APSC Engineering) to monitor heat input on the remaining Tank 55 door sheet welds: "APSC Engineering recommends monitor and document heat input so we know how door sheet was welded to help resolution." Mr. Balowski (APSC Welding Engineer) is involved in the e-mail chain related to this engineering guidance and he responds to Mr. Stevens and Mr. Kale, "I concur."

The TANCO Weld Tracking Report (WTR) data was found in the Tank 55 records. The data in this report was transcribed by hand into a notebook because PWSRCAC was not allowed to make any copies of APSC tank records (only view them and take notes). The transcribed notes are shown in the table below.

58-TK-55 Diesel Storage Tank ***Weld Tracking Report (WTR)- Door Sheet*** ***Inspector James Mark Hodges; NDE Type Radiographic Test***					
Weld No. **Inside Welds**	Preheat Temp (F)	Welding Speed (inches per minute)	Amps	Volts	A= Accept R= Reject
FW-1	165	6	120	23	A
FW-2	155	6	135	23	A
FW-3	165	6	125	23	A
FW-4	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-5	170	6	125	23	A
FW-6	165	6	135	23	**R**
FW-7	170	6	120	23	A
FW-8	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-9	155	6	135	23	A
FW-10	170	6	140	23	A

There are 10 welds on the inside and 10 welds on the outside of the door sheet. Preheat data was obtained for 8 of the 10 inside welds. Field weld (FW-6) has in-process data but the weld is listed as being rejected based on nondestructive testing (NDE).

58-TK-55 Diesel Storage Tank ***Weld Tracking Report (WTR)- Door Sheet*** ***Inspector James Mark Hodges; NDE Type Radiographic Test***					
Weld No. **Outside Welds**	Preheat Temp (F)	Welding Speed (inches per minute)	Amps	Volts	A= Accept R= Reject
FW-1	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-2	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-3	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-4	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-5	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-6	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-7	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-8	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-9	**N/A**	**N/A**	**N/A**	**N/A**	**R**
FW-10	**N/A**	**N/A**	**N/A**	**N/A**	**R**

No preheat data was obtained for any of the 10 outside welds. Over 60% of the welds made on the door sheet do not have heat-input data.

Both APSC and the agencies observed the heat input data on the remaining eight (8) welds was abnormally consistent. They pointed out that the welding variables were more consistent than typical. Ms. Harvey looked at a few other weld tracking reports to better understand the "typical" deviation in welding variables. For example, a weld tracking report for the Tank 55 Water Draw-Off Sump showed preheat temperatures ranging from 150-225 ^{o}F, welding speeds ranging from 5.5 to 9, and voltage from 21 to 24.[52] The weld tracking report for Tank 55 Floor and Column Plates shows preheat temperatures ranging from 110-103 ^{o}F, welding speeds ranging from 6 to 7, voltage from 24 to 28, and amps from 270-291.[53] By comparison, the range of values for welding speed and voltage in the table above does not exhibit the variability that might be expected of such data.

APSC Re-examines the Weld Procedure Allegation in 2006: The June 13, 2006 APSC internal investigation report submitted to APSC President Mr. Hostler responds to the question of whether there was heat input monitoring while the Tank 55 door sheet was welded.

[52] dated 9-7-02; data collected by Inspector Kale
[53] dated 9-11-02; data collected by Inspector Kale.

A direct quote from the report is provided below:

> *Objective evidence confirms that resulting welds are fully compliant with all applicable criteria. This is a classic "technicality" that does not pose any integrity concern. One issue that bears mention is an allegation of "false records." The project records contain an inspection record that appears abnormally consistent; typical records would normally contain more variation. It is entirely possible that the inspector rounded off the numbers, and we have no reason to question his integrity other than non-typical appearance of the record. In any event the data recorded is within all specifications, the relevant criteria do not require that every bit of work be documented, and project records review allowed us to verify the integrity of the weld involved.*
>
> *Maximum heat input in the revised WPS T-400-2G-1 (Rev. 5) and T-400-G-1 (Rev. 4) in accordance with ASME Section IX, QW-409.1 for the shell thickness range of 0.280-0.560 inches should have been 40,800 J/in instead of 46,800 J/in. Welding of the door sheet was performed with a 46,800 J/in limitation that was specified in the original WPS and also specified in the revised WPS.*
>
> *Heat input for welds FW-1, FW-2, FW-3, FW-5, FW-6, FW-7, FW-9 and FW-10 calculated from the in-process information documented in the Weld Tracking Report (WTR) ranged from a low of 27,600 J/in to a high of 32,200 J/in. This heat input was in conformance with the maximum heat input limitation of 40,800 J/in for a 0.312-in base metal thickness.*
>
> *No in process welding variables (preheat, amperage, voltage, travel speed) were documented for the welding of the door sheet welds: FW-1A thru FW-10A (outside welds) and FW-4 and FW-8 (inside welds). The remaining inside welds: FW-1, FW-2, FW-3, FW-5, FW-6, FW-7, FW-9 and FW-10 had documented in-process information in the WTRs. There were a total of eight inside and outside welds. Four vertical (3G) and four horizontal (2G) welds were required to complete the reinstallation of the door sheet.*
>
> *In accordance with Alyeska Surveillance/Repair Procedure TM-1 (8/8/02) the extent of examinations was: 'perform welding and visual in-process examination on a random basis. Even though no in-process information was documented of all the outside welds and inside weld segments FW-4 and FW-8, the in-process information that does exist is sufficient to verify compliance to the WPS was met for a sufficient portion of the welding to meet the extent of in-process examination required by TM-1. TM-1 required visual in-process examination on a 'random basis.' There is no requirement in API 650 or API 653 for in-process inspection of welding.*

Questions posed to APSC personnel*:* During the June 14, 2006 records review at APSC's office, APSC staff explained that Tank 55 radiographs of the door sheet weld had been sent to Don Lockman at Alaska Testing Institute. Mr. Lockman provided a report to APSC on June 12, 2006. Ms. Harvey asked if the integrity of the weld could be determined by reading the radiograph. APSC responded that the radiograph would show the workmanship of the weld, and would not verify the "toughness" of the weld or the integrity of the original metal to which the weld was added.

Excerpts from Mr. Lockman's June 12, 2006 report states:

> *In reviewing radiographic film on 06-10-2006 that was originally produced on 09-21-02 by Kakivik Asset Management Inc., I have found the film quality and weld quality to be within the code acceptance standards required.*
>
> *The film reviewed was from the installation of a door sheet of tank No. 55 as illustrated on the reader sheets and identified on the film.*
>
> *The original horizontal tank welds that were not required to be repair welded but were included in these film shows some anomalies which cannot be evaluated without visually seeing the original welds to confirm possible weld cap over lap indication from one side to the other.*

APSC staff confirmed that they did have 100% visual and radiographic data on the Tank 55 welds, but did not have 100% of the in-process data. APSC maintains that 100% of the in-process information is not required, and that 40% of the data collected is sufficient to make a determination about quality control.

APSC concludes 40% of the door sheet in-process data is sufficient to determine the weld quality and the integrity of the heat affected zone

Mr. Beckett explained the process used to compute the amount of heat input. He said they collected the travel speed, amperage, and voltage in-process data while 40% of the welds were completed on the Tank 55 door sheet. Mr. Beckett then used this data to compute the heat input. The heat input computation for all of the welds with in-process data was below the heat input limitation required for a diesel tank, as determined in 1998 by the extensive weld test panel work. The actual heat input is not known for the other 60% of the welds because in-process data (needed to compute the heat input) was not collected during the welding process. APSC assumes that the 60% of the welds without in-process data were installed using the same techniques the welds with in-process data. APSC concludes data from 40% of the welds is sufficient to determine the weld quality and the integrity of the heat affected zone.

Ms. Harvey asked Mr. Beckett about his earlier comments about the in-process data looking "curious," and the fact that the 2006 investigation was carried out in more detail to further examine the "curious" weld tracking report data collected by Mr. Hodges (KAM Inspector) on September 17, 2002. Mr. Beckett said that while the weld tracking data looks abnormally consistent across all the welds, he had no reason to doubt Mr. Hodges integrity.

Findings:

1. The Weld Tracking Report for the Tank 55 door sheet confirms that heat input data was not collected on 60% of the door sheet welds (all the outside welds and two inside welds).
2. Mr. Kale (KAM Inspector) lists the lack of in-process data on the welds as the basis for the unsatisfactory inspection, yet on September 20, 2002, Mr. Stevens (KAM Inspector) changes the inspection finding to "satisfactory" based on engineering advice; however

no engineering document was provided from the 2002 timeframe to support this decision.

3. Mr. Harrison (JPO Head of Employee Concerns Program) recommended additional testing of the welds to check integrity of heat affected zone around the weld, citing potential risk of brittle failure if there was too much heat introduced.
4. ADEC issues a letter stating it is the agency's understanding that APSC will not put Tank 55 back into service until the agency's investigation is complete. However, APSC puts Tank 55 back into service on November 26, 2006, and ADEC does not issue its inspection findings until April 4, 2003.
5. On November 19, 2002 APSC provides Mr. Harrison (JPO) a list of unsatisfactory conditions found by the inspectors on all the tanks in question, including Tank 55. The heat input concern is not listed in the report provided to JPO.
6. ADEC's 4/4/06 letter to APSC concludes heat input is considered a supplemental essential variable. And, although heat input can be calculated from the (welding) travel speed, amperage, and voltage, the weld tracking report does not have any weld tracking data for about 60% of the welds.

JPO employee recommends weld testing prior to returning the tank to diesel service; testing

7. No repairs or tests were required by the agencies.
8. No findings report was issued by JPO.
9. No enforcement action was taken by ADEC or JPO.
10. Tank 55 continues to operate today with a door sheet containing 60% of its welds with unknown in-process data, and therefore unknown heat input.

Potential Areas for Additional Investigation

1. Should PWSRCAC hire a welding expert to provide PWSRCAC with a technical opinion on whether there is a potential risk for a failure of the Tank 55 door sheet weld? Some questions that could be examined include:
    a. Does the September 17, 2002 weld tracking data report look reliable enough to be used to compute the heat input for the inside welds?
    b. Is 40% of the in-process data sufficient to determine the integrity of the heat affected zone and weld quality of the remaining 60% of the welds, which do not have in-process data?
    c. Was it reasonable for APSC and ADEC to allow Tank 55 to return to service without in-process data on all the door sheet welds?
    d. Should a hardness or toughness test be done of the welds for which in-process information was not recorded?

e. If it is determined that 40% of the in-process data is insufficient to determine the quality of 100% of the tank welds and heat affected zone, is four years of operation in diesel storage service an adequate replacement for the missing in-process data?

Allegation No. 3- Floor Plate Laminations

Concern: "Plate lamination. Many of the plates used for the floor had lamination. No NDE [Non destructive testing] was done to determine the extent of the flaw. No assessment was done. The areas were ground out." This does not satisfy API 653-2.3.6."

ADEC Finding:[54] "Not an issue. Same comment as TK 5 and 93." For clarity, ADEC's response on the Tank 5 and Tank 93 lamination concern is provided: "API 653-2.3.6 is only for shell course lamination. No section of API 653 can be found relating to ***FLOOR*** plates lamination."

Was high quality metal used to replace the tank floor?

Analysis: A lamination is a metal defect with separation or weakness generally aligned parallel to the worked surface of the metal. A lamination may be the result of blisters, seams, inclusions or manufacturing defects.

ADEC restricts their analysis to the specific language of API 653, Section 2.3.6, but does not answer the more important questions: (1) were there defects in the material used to repair the tank floors, and (2) could the use of poor quality material increase the oil spill risk?

Interview with JPO: Mr. Harrison, JPO, explained that JPO and ADEC received a complaint about laminations in the metal used to repair the tank floors. The complaint alleged the laminations were shaved out of the metal surface and nondestructive testing was not completed to ensure adequate metal thickness before using the material to repair/replace the tank floors.

Confidential Source: One person said the metal that was used to repair the tank floors was the poorest they had ever seen in decades of experience repairing tank floors. The metal surface had hundreds of imperfections/laminations. This source alleges APSC told the welders to weld metal over the laminations yet the defects were not integrity-tested before the tank was returned to service.

Records: JPO provided a November 19, 2002 letter from APSC which documented all the unsatisfactory inspection conditions found on Tank 55 during the 2002 Tank Program.[55] The

[54] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.
[55] November 19, 2002 letter from Rod Hanson (APSC) to Willie Harrison (JPO), VMT Tank Program – Inspection Documented Unsatisfactory Conditions

Tank Program Unsatisfactory Tracking Log does not list any unsatisfactory inspections associated with laminations. A review of APSC's tank records did not show any record of unsatisfactory inspection findings related to the material used to replace the Tank 55 floor.

An API 653 inspection was completed on Tank 55 before it was returned to service.[56] The report states the entire Tank 55 floor was replaced. The report did not list any inspection concerns about the quality of the material used to replace the floor or laminations contained in the material.

In response to a JPO inquiry about whether or not there were problems with the quality of the material used to replace Tank 55's floor, APSC responded "[n]o laminations were observed in the Tank 55 bottom plate." [57]

On October 30, 2006, Mr. Jones (APSC Vice President) sent PWSRCAC additional information provided by the APSC engineering team on Tanks 55, and 16 in response to PWSRCAC's preliminary findings.[58] The Tank 55 response confirms that APSC engineers are still confident the quality of the material used to replace the tank floor.

> ***Question 2:*** *We understand this question to deal with the concern that floor material for TK-5, TK-16, and TK-93 met the required physical and chemical requirements of the ASTM A 36 material specification.*
>
> ***Response:*** *Alyeska purchases tank floor plate in accordance with the industry standard ASTM A 36 material specification without modification. The material is purchased in large quantities and stockpiled at VMT for future use to alleviate excessive lead time delays. When the material was initially acquired, Material Test Reports (MTRs) were provided by the floor plate material supplier. These reports were reviewed and accepted prior to receipt of the material for use in VMT tank repair and replacement projects.*

Finding: The allegation that defective materials were used to replace Tank 55's floor could not be substantiated based on the records provided for PWSRCAC review. However, not all the records were made available to rule out this concern. Ms. Harvey recommended that the engineering specifications for the tank floor material quality be reviewed, and compared to the material delivery and quality control records. This will confirm if quality material was ordered and received. Ms. Harvey was denied the opportunity to meet with the APSC engineer that worked on this tank floor replacement, and was denied further access to APSC engineering records. Therefore, this issue could not be resolved.

Additional records needed to verify floor material quality

[56] January 23, 2003 Internal APSC report from W.R. Mott to Kelly Lee (APSC), Corrosion Report: 58-TK-55.
[57] November 19, letter from Rod Hanson (APSC) to Willie Harrison (Joint Pipeline Office), 2002 VMT Tank Program, Inspection Documented Unsatisfactory Conditions
[58] October 30, 2006 e-mail from Greg Jones (APSC) to Stan Stephens (PWSRCAC), Responses to PWSRCAC's Questions.

Allegation No. 4- Shell Peaking

Concern: "Peaking" of shell at the shell to annual weld. Distortion was not in compliance with API 653."

ADEC Finding:[59] "The allegation was based on a draft API 653 report. The description of the distortion (clockwise- counter clockwise) is not considered "peaking" but rather "banding" by API 653. API 653 (1992 version) -Section 2.3.5.1 specifically refers to peaking and banding at welded joints, not tank shell. API 653 (1992 version)-Section 8.5.5, allows up to one (1) inch of (banding) distortion. There is an API interpretation regarding Section 8.5.5 specifying that this Section does NOT apply to the "shell to annual welds." Section 8 of API 653 is entitled Dismantling and Reconstruction. Since no tank shell was dismantled or reconstructed, the entire Section 8 might not be applicable, thus not enforceable. The final version of the API 653 report states that this distortion complies with API 653."

Analysis: API 653 defines "peaking" as an important dimensional tolerance that an inspector should check on a tank to produce a reconstructed tank of acceptable appearance and structural integrity and to permit proper functioning of floating roofs and seals. To measure the amount of peaking, an inspector is required to take a horizontal board 36" long, and make a horizontal sweep using this board along the outside radius of the tank to check for the degree of peaking. The current edition of API 653 requires no more than ½" of peaking. The Tank 55 records did not show unsatisfactory inspection findings for shell peaking.

Shell peaking allegations were not substantiated

Finding: No written records could be found to substantiate the allegation of shell peaking.

Allegation No. 5- Elimination of the sump without having a drawing

Concern: "Elimination of the sump without having a drawing."

ADEC Finding:[60] "Not an issue. Final construction agrees with the final drawings."

Analysis: A sump is a reservoir for liquid which is located in the bottom of the tank. Liquid in the sump can be pumped off from the bottom of the tank. The sump was removed from Tank

Sump allegations were not substantiated

[59] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.
[60] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

55, when the floor was replaced. It is alleged that a drawing was required for this change in tank design and this change was not engineered via a revised drawing.

The Tank 55 records did not show sump drawings as an issue.

Finding: This concern was not documented in the written records.

Allegation No. 6- Foundation Spalling

Concern: "Spalling of the foundation. This will need an engineering analysis before putting the tank back into service."

ADEC Finding:[61] "Not an issue. The final API 653 report states that TK 55 is suitable for continued service."

Analysis: Spalling of a foundation refers to the condition exemplified by crumbling gravel or rock, decaying concrete, collapse of foundations in sections that do not expose dirt on the outside, etc. When these conditions exist, foundations are usually treated with epoxy and concrete mixtures to correct deficiencies.

APSC should verify foundation spalling was remedied

The Tank 55 API 653 inspection report showed spalling of the foundation was found and would be corrected prior to returning the tank to service. No records were made available to PWSRCAC to confirm the repairs were made.

Findings: API 653, Section 4.5.2.2 requires foundation spalling to be repaired to prevent water from entering the concrete structure and corroding the reinforcing steel. The inspection records show that this was identified as a problem, and would be corrected; however, the API 653 inspection report does not verify if this work was completed. It is recommended that APSC check their records to ensure this work was completed.

Allegation No. 7- Welded temporary attachments to annular ring. No preheat.

Concern: "Welded temporary attachments to annular ring. No preheat was used."

ADEC Finding: ADEC did not investigate this inspection concern.

[61] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

Analysis: Temporary attachments are sometimes used in the repair process to temporarily hold material in place while completing the repair. The concern appears to be that these temporary attachments may have been welded onto the annular ring without proper preheating during the welding process.

The preheating process is used to heat the base metal prior to welding new metal to it. Preheating involves heating the base metal, either in its entirety or just the region surrounding the joint, to a specific desired temperature, called the preheat temperature. Heating may be continued during the welding process, but the welding heat may be sufficient to maintain the desired temperature without a continuation of the external heat source. "There are four primary reasons to utilize preheat: (1) it lowers the cooling rate in the weld metal and base metal, producing a more ductile metallurgical structure with greater resistant to cracking; (2) the slower cooling rate provides an opportunity for any hydrogen that may be present to diffuse out harmlessly without causing cracking; (3) it reduces the shrinkage stresses in the weld and adjacent base metal, which is especially important in highly restrained joints and (4) it raises some steels above the temperature at which brittle fracture would occur in fabrication. Additionally, preheat can be used to help ensure specific mechanical properties, such as notch toughness. In determining whether or not to preheat, the following array of factors should be considered: code requirements, section thickness, base metal chemistry, restraint, ambient temperature, filler metal hydrogen content and previous cracking problems."[62]

This concern was documented in the inspection records on September 4, 2002. The actions taken to respond to this concern were documented by APSC Engineering on November 18, 2002:

> *TANCO welded temporary dogs onto the annular ring to facilitate installation of the tank water draw sump. The attachments were temporary and were removed after installation of the sump. The weld areas were cleaned up and evaluated with Magnetic Particle Testing (MT) to ensure that the annular plate was competent. The results of the MT examination showed no indications. The areas are acceptable for use "as-is."*[63]

Finding: The APSC Engineering Department took action on the inspection concern, and completed nondestructive testing to confirm annual ring integrity. This solution appears to be appropriate and consistent with industry standards; however, this should be added to the list of items to be verified by a weld expert if one is brought in to examine Tank 55 and provide PWSRCAC with further recommendations.

Annular ring concerns appear to be properly addressed; this could be verified by a weld expert.

[62] Scott Funderburk, Lincoln Electric Company Engineering Services Article, May 1998.
[63] November 18, 2002 e-mail from William Mott to Clifford Moore, regarding Project X-052 Unsat #18 Tank 55 Annular Ring Welding.

Allegation No. 8- Welding out of sequence on door sheet

Concern: "Welding out of sequence on door sheet."

ADEC Finding: ADEC did not investigate this inspection concern.

Analysis: 12'6" wide by 13'6" tall door opening was cut into the side of Tank 55 to allow for heavy equipment to enter the tank to replace the tank floor. Once Tank 55's floor was replaced, a door sheet was welded over the hole created. It is alleged that the welding procedure for a door sheet, requires the welds to be made in a specific order and that the specific order in which inside, outside, vertical, and horizontal welds must be made was not followed.

Concerned individuals reported that there were a number of issues that were reported to ADEC that were not addressed in their investigation, including this specific one. This issue was documented in the inspection records on September 19, 2002. The actions taken to respond to this concern were documented by APSC Engineering on October 31, 2002:

> *The unsat was written to describe that the door sheet welding was completed on the outside of the tank (including corners and 12" cut-backs) before the inside horizontal corner and 12" cutback welds were complete. After the outside of the door sheet was completely welded, TANCO proceeded to weld the inside horizontal joints and then the corners and cut-backs. This is acceptable.*
>
> *The specification states that the vertical door sheet welds will be completed, then the horizontal door sheet welds will be completed. The specification does not specify when the corners or cut-backs are to be welded and the specification also does not specify whether it is the inside or outside joints that are welded first. The most important part of the door sheet welding is with regard to the long seams. The fact that TANCO chose to weld the corners and cut-backs when they did is acceptable and does not violate the Alyeska specification.*
>
> *The sequence of welding that took place is as noted below and the fact that the corners and cut-backs on the outside of the tank were welded when they were is not relevant as the vertical and horizontal joints were welded in accordance with the Alyeska Project Specification X052-T-411.*
>
> *1) outside vertical joints*
>
> *2) inside vertical joints*
>
> *3) outside horizontal joints (along with outside corners and cut-backs)*
>
> *4) inside horizontal joints (along with inside corners and cut-backs)."*[64]

Door sheet welding sequence warrants further examination by a welding expert.

[64] October 31, 2002 e-mail from Anthony Balowski to William Mott and Thomas Marchesani, regarding UNSAT: TK-55 Door Sheet Welding Sequence.

Finding: It is recommended that this concern be added to the list of issues to be examined by a welding expert.

Allegation No. 9- Adequacy of 16" valve coating

Concern: "Acceptability of the 16" valve coating; External coating of a 16" fill/drain valve for Tank 55."

ADEC Finding: ADEC did not investigate this inspection concern.

Analysis: Coatings are often applied to metal components to protect them during their service life. It was alleged that the coating on a Tank 55 valve was unacceptable. The 16" valve coating concern was documented in the inspection records on October 6, 2002. The actions taken to respond to this concern were documented by APSC Engineering on November 16, 2002.

> *The unsat was written due to the presence of oil on the steel surface prior to coating. The valve has been rebuilt and reassembled by VMT maintenance. The HNJV crew mobilized the valve in a heated paint area for external coating. When heated the valve gear case seeped oil or grease from the seam. The contractor retorqued the case bolts, removed the heat source and cleaned the area with thinner. The area was reblasted. The unsat was written as trace amounts of oil were still present at the gear case seam.*
>
> *The valve is acceptable for use "as-is." The service is atmospheric and relatively unaggressive. The coating is in an area that can be easily accessed and repaired if failure of the coating occurs in the future."*[65]

Finding: The APSC Engineering Department took action on the inspection concern. It would be prudent to examine the actual condition of this valve coating, four years later, and make repairs if required.

Valve coating integrity should be confirmed

Allegation No. 10- Installation of automatic valves

Concern: "Need to verify if automatic valves were installed to comply with the VMT C-Plan Section 2.7.1.1, p. 2-38 to allow for 48-hour leak tests on a monthly basis."

ADEC Finding: "ADEC did not investigate this inspection concern.

[65] October 31, 2002 e-mail from Anthony Balowski to William Mott and Thomas Marchesani, regarding UNSAT: TK-55 Door Sheet Welding Sequence.

Analysis: Section 2.7 of the VMT Oil Spill Prevention and Response Plan (C-Plan) lists compliance issues which require APSC action. As part of the VMT C-plan approval, ADEC required the APSC to install automatic valves in Tank 55 to perform monthly leak tests.

This concern was found in the inspection logs during the record review.

Findings: There was no documentation in the records available for review to determine if this concern was addressed. It is recommended that APSC verify the valves were installed and are operating in compliance with the leak testing requirements of the VMT C-plan to close out this issue.

Valve installation and functioning should be confirmed

Valdez Marine Terminal

Tank 5

Alleged Integrity Concerns Preliminary Investigation

Report Requested by:
the Prince William Regional Citizens' Advisory Council

Prepared by:
Harvey Consulting, LLC.

December 17, 2006
Revision No. 1

March 13, 2007
Revision No. 2

Executive Summary

Prince William Sound Regional Citizens Advisory Council (PWSRCAC) requested Harvey Consulting, LLC's assistance to investigate the alleged tank integrity issues for Valdez Marine Terminal (VMT) Tank Number 5 (Tank 5). PWSRCAC received letters from Chuck Hamel in May, 2006, requesting the council investigate tank integrity issues on Tank 5, which along with other tanks were inspected and repaired in 2002. Dr. Kuckertz (P.E., PWSRCAC) completed the Tank 5 record review at Alyeska Pipeline Service's (APSC's) offices. In addition to the notes provided by Dr. Kuckertz, PWSRCAC requested that Harvey Consulting, LLC. review agency records and meet with concerned individuals to better understand the scope of the allegations, and make a recommendation for further action by PWSRCAC. This report summarizes the work completed by Harvey Consulting, LLC, in the course of completing a preliminary investigation on the alleged Tank 5 integrity concerns.

Tank 5 is a 535,000 barrel crude oil storage tank. It was constructed in 1976 and received an internal inspected in 1991 and 2002. Tank 5 is located in secondary containment capable of storing the entire contents of the tank.

Employees working at the VMT during the 2002 Tank 5 inspection and repair work allege that materials and repair procedures (especially welding procedures) were substandard and the tank shell and roof were not properly inspected. ADEC started investigating the twelve Tank 5 allegations in October 2002. Tank 5 was returned to service in November 2002, prior to ADEC reaching a finding on whether the allegations were substantiated. ADEC did not reach a finding on the allegations until April of 2003. All twelve allegations were dismissed by the agency.

Requests made for meetings with APSC staff, and APSC contractors, to discuss the Tank 5 allegations and review additional records were denied.

Requests made for meetings with ADEC staff, and former ADEC staff, to discuss the Tank 5 records were denied. However, Ms. Lewis (ADEC) did confirm:

> *There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.*[1]

[1] August 30, 2006 e-mail from Ms. Lewis (ADEC) to Ms. Harvey (PWSRCAC) copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses.

One of the twelve allegations was not substantiated based on the records available for this review. It was alleged that the annular plate did not received 100% Ultrasonic Testing (UT); the testing was completed.

Five of the twelve allegations were substantiated based on the records available for this including: API 653 Inspector's finding of incomplete roof and support column inspection; lack of construction and inspection records available for inspectors; API 653 Inspector's finding of incomplete shell inspection; and lack of tank nameplate.

Additional records and expert review would be required to make a finding on the remaining six allegations including: floor material quality; floor quality testing; annular plate inspection after back-gouging; welding of floor to annular ring; heat treatment of metal on access door area; and joint design on access door area.

Information Available For This Report

PWSRCAC requested records from ADEC and JPO. ADEC and JPO provided physical copies of letters via U.S. Mail; however, these records essentially denied any Tank 5 welding concerns from the 2002 timeframe. In May 2006, PWSRCAC requested an opportunity to review APSC Tank 5 records from the 2002 timeframe. In June 2006, PWSRCAC was provided two opportunities to visit APSC's Anchorage office to read and take notes, but not photocopy, information from the Tank 5 files.[2] Dr. Kuckertz (P.E., PWSRCAC staff) completed the APSC record review for Tank 5. In September 2006, APSC provided a copy of their July 3, 2006, report entitled 2002 Valdez Tank Project Review. Attempts to set up additional meetings with APSC Engineering and ADEC to obtain additional information were denied. A written request for additional agency records was prepared by Harvey Consulting, LLC, for PWSRCAC in June 2006, but was not sent by PWSRCAC.

It is recommended that PWSRCAC obtain and review several key reports which were mentioned in APSC and agency documentation, but not provided to PWSRCAC, including:

1. Original APSC inspection reports for Tank 5 which documented inspectors findings;
2. APSC President Wight October 2002 report to JPO on Tank 5 investigation;
3. Engineering Report commissioned by David Wight (APSC) and carried out by Dan Hisey in late 2002; and
4. JPO findings on Tank 5.

On November 26, 2002 Tank No. 5 was returned to service. There is no written record of ADEC or JPO approving this tank to be returned to service, nor were there any agency findings

[2] June 14, 2006 and June 20, 2006

issued on or before this date. PWSRCAC should request agency records which approved this tank to be returned to service.

Allegations

Twelve Tank 5 Allegations

Employees working at the VMT during the 2002 Tank 5 inspection and repair work allege that material used to replace the tank floor was sub-standard, there was faulty welding and an incomplete inspection of the shell and tank roof.
In late 2002, ADEC started an investigation into the allegations raised during the 2002 VMT Tank Inspection and Repair Program. On April 25, 2003, ADEC issued a findings document summarizing the results of their investigation.[3] This report shows twelve Tank 5 allegations were reported to ADEC and investigated.

Dr. Kuckertz (P.E., PWSRCAC) reviewed the Tank 5 records at the APSC offices on June 14, 2006, and June 20, 2006. Dr. Kuckertz (P.E., PWSRCAC) examined each of the unsatisfactory inspection findings to ensure that there was documentation showing that the inspection finding was closed out. Dr. Kuckertz (P.E., PWSRCAC) concluded that each of the unsatisfactory inspection findings identified by the inspectors was determined to be satisfactory by another inspector prior to returning the tank to crude oil service.

During the interviews conducted by Harvey Consulting, LLC, several people continued to be most concerned about the quality of material used to replace the floor in Tank 5, the welding procedures and incomplete inspection.

Background

According to industry standard API No. 653, tanks are typically internally inspected at least once every decade, unless tank integrity history or risk indicate a different interval. In 2002, Tank 5 was due for an internal tank inspection.

During 2002, Tank 5 was cleaned, inspected, repaired, and returned to service.

Chronology of Events

This section provides a brief chronology of events associated with the inspection and repair work completed on Tank 5 and the subsequent investigation into employee(s) allegations.

[3] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

February 1, 2002
A letter from APSC to ADEC outlined the problems with the cathodic protection (CP) system installed under Tank 5 in 1991. The Tank 5 CP system was the first design attempted at the VMT and used a serpentine system which was later determined to be ineffective, and in 2002 APSC planned to remove the 1991 CP system and install a new CP system, and tank floor.[4]

May 14, 2002
A letter from APSC notified ADEC and JPO that APSC planned to remove the 1991 CP system and install a new CP system, and tank floor.[5]

Summer and Fall 2002
Tank 5 was cleaned, inspected, repaired. A new tank floor and CP system was installed.

ADEC's letter to PWSRCAC dated June 19, 2006, stated that from June 2002 through September 2002 various APSC employees and contractors provided ADEC with copies of emails relating to Tank 5. Interviews with Mr. Harrison (JPO) in August 2006 confirmed that Tank 5 integrity allegations were reported to JPO and ADEC during the summer and fall of 2002.

September 20, 2002
A letter was sent from APSC President David Wight to JPO and Commissioner Brown (ADEC) about the Tank Floor Repair.[6] The letter says the technical issues involved the floor plate material that was used and the associated welding processes. APSC President Wight states that Dan Hisey has undertaken an additional review of the project and that the "technical interpretation issues associated with the floor plate material and the welding also included some people issues where we intervened earlier with an ECP process." Mr. Wight commits to investigating the matter and providing JPO with a report summarizing the status of APSC's investigation in mid-October 2002.

October 1, 2002
Mr. Harrison (JPO) and Ms. Friedman (ADEC) met with a concerned employee. The employee was working at the VMT and was concerned about repairs being made to Tank 5. The main concerns were the quality of the material used to replace the tank floor and the welding procedures.

October 2, 2002
ADEC conducted a VMT Tank Inspection on July 18, 2002 and issued a report on October 2, 2002. The agency report only mentions minor issues with the Tank 5 chime area, which is confusing since by October 2002, APSC's President and senior officials at ADEC and JPO were investigating over a dozen employee concerns relating to Tank 5.

[4] February 1, 2002 Letter from Tom Stokes (APSC) to Becky Lewis (ADEC), Cathodic Protection Questions on Tank 5
[5] May 14, 2002 Letter from Rod Hanson (APSC) to Bonnie Friedman (ADEC) and John Kerrigan (JPO) and Jerry Brossia (JPO), Crude Tank Inspections – West Tank Farm, Valdez Marine Terminal
[6] September 20, 2002 letter from David Wight (APSC) to Jerry Brossia and John Kerrigan (JPO) and Michele Brown (ADEC Commissioner), Tank 5 Floor Repair.

October 16, 2002
ADEC requested information on the inspection and repair of Tank 5. ADEC's letter states that:[7]

> *The Department is aware that these tanks will not be returned to service until such time that certain issues have been resolved.*

October 16, 2002
APSC responds to ADEC, that APSC is "confident that the work on these tanks was appropriate and consistent with applicable codes…On Monday, October 21, 2002, we will release tank 5 for return to normal service."[8]

November 19, 2002
APSC responds to JPO with a detailed list of all unsatisfactory findings documented by the inspectors on the 2002 VMT Tank Program.[9] This letter documents 11 unsatisfactory findings for Tank 5. APSC provided information describing how each problem was addressed.

Author's Note: APSC responds to JPO listing 11 unsatisfactory findings for Tank 5; however, a total of 12 allegations surface during the course of the investigation into employee concerns on Tank 5.

November 23, 2002
Tank 5 was returned to service.[10]

December 20, 2002
APSC informs ADEC Tank 5 was internally inspected, repaired and returned to service.[11]

January 13, 2003
APSC provides ADEC with a copy of Tank 5 Inspection Report. The report summary was prepared by APSC; the original inspector reports were not provided.[12]

April 25, 2003
ADEC sent APSC a letter closing out the twelve (12) Tank 5 allegations.[13] ADEC did not substantiate any of the allegations.

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[7] October 16, 2002 letter from Bill Hutmacher (ADEC) to Robert Shoaf (APSC), Request for information on inspection and repairs of Tanks 5, 55, and 93.
[8] October 16, 2002 letter from Robert Shoaf (APSC) to Bill Hutmacher (ADEC), Request for information and repairs of Tanks 5, 55, and 93.
[9] November 19, 2002 letter from Rod Hanson (APSC) to Willie Harrison (JPO), VMT Tank Program – Inspection Documented Unsatisfactory Conditions.
[10] June 21, 2006 e-mail from Sharon Marchant (APSC) to Susan Harvey (Harvey Consulting, LLC.), TK-5 and TK-55 Recommissioning Dates.
[11] December 20, 2002 letter from Mr. Hanson (APSC) to Ms. Friedman (ADEC), Planned internal crude tank inspection cycle.
[12] January 13, 2003 letter from Rod Hoffman (APSC) to Ms. Friedman (ADEC), Final Crude Tank Inspection Summaries.
[13] April 25, 2003 letter from Ms. Friedman (ADEC), to Mr. Shoaf (APSC), Review of Employee Concerns, Inspections of Tanks 5, 55, and 93, Valdez Marine Terminal.

Author's Note: ADEC's letter only lists 12 unsatisfactory findings for Tank 5; however, please note ADEC has an error in the numbering scheme (missing number 11) and inadvertently lists 13 allegations, rather than 12.

July 2, 2003
APSC submits an annual report for Year 2002 to JPO which included a new cathodic protection system and tank bottom in Tank 5 as one of APSC's accomplishments for 2002.[14] This report stated Tank 5 roof and shell showed no substantial corrosion during the 2002 inspection.

May 10, 2006
Chuck Hamel submits a letter to PWSRCAC alleging unsafe conditions of Tank 5.

May 12, 2006
APSC responds to PWSRCAC's inquiry about Tank 5 allegations. APSC confirms inspectors raised concerns on Tank 5 during 2002, but reports these concerns were all addressed by APSC engineers prior to returning the tank to service.

May 16 & 18, 2006
Mr. Hamel was not satisfied with APSC's May 12, 2006 response, and encouraged PWSRCAC to complete a Tank 5 investigation.

May 23, 2006
PWSRCAC submitted a public records request to ADEC requiring all the tank inspection and repair records on Tank 5 since 2000.

June 14, 2006
Dr. Kuckertz (P.E., PWSRCAC) reviewed tank inspection and repair records at APSC's Anchorage Office.

June 19, 2006
ADEC responds to PWSRCAC's Tank 5 record request. ADEC reports Tank 5 inspection, welding and repair issues were investigated by ADEC in 2002-2003. ADEC did not substantiate Tank 5 concerns raised by employees working at the VMT. ADEC withheld many important documents from PWSRCAC citing confidentiality based on attorney client communication or deliberative process.

June 20, 2006
Dr. Kuckertz (P.E., PWSRCAC) reviewed tank inspection and repair records at APSC's Anchorage Office.

July 3, 2006
In response to concerns raised by Mr. Hamel on Tank 5, APSC reviewed the Tank 5 records for APSC President, Mr. Hostler. APSC's July 3, 2006, report to Mr. Hostler concludes:[15] The APSC

[14] July 2, 2003, letter from Mr. Monthei (APSC) to Mr. Brossia (JPO), 2002 MP-166 Integrity Management Monitoring Program Annual Reports.

report concludes that all Tank 5 concerns raised by inspectors were addressed by APSC and fixed, if necessary, before returning the tank to service.

August 2006 (various dates)
Ms. Harvey (Harvey Consulting, LLC) interviewed Mr. Harrison (JPO). Mr. Harrison confirmed employee concerns were reported to JPO and ADEC on Tank 5. The main concerns included the quality of the material used to replace the floor and welding processes.

Ms. Harvey interviewed employee(s) that worked on VMT 2002 tank inspection and repair work who alleged the quality of the Tank 5 floor material was a significant issue, along with use of inappropriate welding procedures. Confidentiality was requested due to fears of retaliation for speaking about what happened on Tank 5 in 2002.

Ms. Harvey requested to meet with APSC Engineer (Tony Balowski) and KAM Inspector (Mike Stevens) to discuss Tank 5 and review engineering records on the allegations. Requests for meetings were denied by APSC.

Ms. Harvey made a request to meet Bonnie Friedman (previous ADEC employee), Sam Sangsudam (ADEC) and Becky Lewis (ADEC). Requests for meetings were denied.

August 30, 2006
On August 30, 2006, Ms. Lewis wrote to Ms. Harvey, copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses:

ADEC declines meeting and records on Tank 5 due to current state investigation

This email is in response to your request this afternoon that Sam Saengsudham and I meet with you on Friday, September 1, 2006 to discuss PWSRCAC's investigation into the Chuck Hamel allegations made in May of 2006 concerning several tanks at the Valdez Marine Terminal (VMT). We have decided not to meet with you at this time. There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.

Analysis of Allegations

ADEC's April 25, 2003 Findings Document[16] lists twelve (12) employee concerns raised on Tank 5 during the 2002 Tank Project. Each of the twelve concerns raised is directly quoted from the ADEC April 25, 2003, finding document in quotations below, with a summary of ADEC's findings, and a brief recommendation for how PWSRCAC might proceed.

ADEC investigated Twelve (12) Tank 5 concerns

[15] July 3, 2006 APSC internal report to APSC President Kevin Hostler, 2002 Valdez Tank Project Review July 3, 2006.
[16] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

Allegation No. 1 – Internal Roof Inspection Quality

Concern: "Roof Rafters were only visually inspected although there was evidence of corrosion. Visual inspection does not satisfy API 653."

ADEC Finding: "API 653 does not specify the inspecting method. However, it calls for inspection and a structural integrity assessment of the roof support system. The "Responsible Inspector" decides how to inspect the rafter."

Inability to inspect roof corrosion documented in API 653 Inspector's report

Analysis: API 653, Section 4.2 Tank Roof Evaluation, allows fixed roofs to be inspected by a method acceptable to the responsible inspector. In this case, KAM Inspector Mr. Lane,[17] recommended a rigorous inspection of the roof (internal) and roof support structure. Inspector Lane's API 653 inspection report documented his inability to inspect the roof and roof support structure.

Inspector Lane's August 24, 2002 Tank 5 inspection report states:[18]

> *<u>Roof Internal:</u> Project Specification XO52-T-500 (Section 8.5.2) mandated for the roof to be inspected visually by use of spotlight and binoculars. The roof was looked at and all rafters and support beams were in place. It is unknown the extent of corrosion pertaining to the rafters and support structures as no access to roof was available for close inspection of roof structure.*
>
> *<u>Roof Structural Members:</u> No thickness readings were taken on rafters or support beam due to the fact that no access was available however random thickness readings were taken on the roof support columns in areas accessible from the floor only.*
>
> *<u>Conclusions:</u> There was no access to underside of roof for inspection purposes and no means of obtaining shell thickness readings as suggested above. It would be this inspector's conclusion that since no previous inspection records were available, and taking into account the age of the tank (approx. 26 years), a full comprehensive inspection should have been in order. This comprehensive inspection should have included, in addition to T-500 requirements the following…visually inspect (by way of manlift or scaffolding) underside of roof, rafters for thinning, roof girders and top portion of roof support columns. Also obtain metal thickness readings and visually inspect welded areas. (Ref. API 653 Sec. 4.2.2) and a comprehensive thickness assessment of the roof plates…*

While API 653 Inspector Mr. Lane documented concerns about the inability to access the inside of the tank roof to perform a complete internal inspection, roof plate thickness readings were taken from the outside on top of the roof. The 2002 report does show that automated ultrasonic thickness (AUT) inspections were performed on a variety of areas of the tank roof (external).

[17] API 653 certified inspector No. 1264

[18] August 24, 2002, API 653 Inspection Report, X052 Storage Tank 54-TK-5, prepared by Lead KAM Inspector, Lynn Lane, API 653 certified inspector No. 1264 for APSC.

> *Thickness scanning of roof around the vapor inlet, vapor outlet and pressure vacuum vent showed lowest thickness reading (after calculations for paint velocity to be .285."The nominal thickness of the roof is .375". AUT (Automated Ultrasonic Testing) was done on the roof per X052-T-500.*

The original nominal roof plate thickness was 0.375" with a 0.125" corrosion allowance, for a minimum design plate thickness of 0.250." The API 653 report shows five roof plates below the minimum design plate thickness of 0.250," including roof plates numbers: 110, 111, 008, 018, and 023.

Corrosion and roof plate thinning was found on eight plates, five were corroded beyond design allowance

APSC produced two versions of the API 653 Tank 5 inspection report: (1) the actual inspection report prepared by the API 653 inspector on August 24, 2002, and (2) a January 29, 2003 summary report prepared for ADEC and provided to PWSRCAC upon request. The January 29, 2003 summary report provided to ADEC shows the roof thinning problem, with roof thickness readings below the design allowance for corrosion, but does not show the API inspector's concern about the internal roof inspection.

It appears that ADEC relied on a summary report developed by APSC, rather than reviewing the original inspection report in developing their finding. Additionally, the agency did not address the more important concern raised by the inspector, which was evidence of roof corrosion.

Findings: API 653, Section 4.2 Tank Roof Evaluation, does allow for fixed roofs to be inspected by a method acceptable to the responsible inspector. In this case the responsible inspector determined the appropriate method for inspecting the roof was to complete an internal and external inspection of the roof. The internal inspection could not be completed, since the inspector was not provided the equipment to access the inside of the tank roof. External corrosion measurements found eight roof plates with corrosion. Five roof plates were corroded beyond the design corrosion allowance. Roof structural supports were not completely inspected. A review of the roof inspection records for Tank 5, and an engineering review of the roof thinning concern, would have resolved this issue in 2002. This concern was substantiated because API 653 provides the Authorized Inspector to decide the roof inspection method and state regulation at 18 AAC 75 requires a complete API 653 inspection.

This concern was substantiated. API 653 Inspector required internal roof plate inspection; it was not completed.

Allegation No. 2 – Lack of Construction and Repair Records

Concern: "Construction and repair records not available for the AI [Authorized Inspector] to review."

ADEC Finding: "Construction: there is no requirement for tanks constructed before state regulations took effect. Repairs: after State regulation took effect, (May 92), all repair records

must be kept for the operational life of the tank. If there has been no repair, this item is not applicable."

Analysis: API 653 does require construction and repair records to be maintained by the owner/operator.[1] API 653, Section 6.8 Records states: "[t]he owner/operator shall maintain a complete record file consisting of three types of records, namely: construction records, inspection history, and repair/alteration history."

Recordkeeping was not consistent with API 653

Summary of Findings: The agency's finding is not consistent with API 653. If construction, inspection and repair records are not available to the inspector, he is required to verify additional items during the inspection that may not otherwise have been required. This concern was substantiated; however, it does not pose an environmental or safety concern requiring further PWSRCAC action at this time.

Allegation No. 3 – Floor Material Quality

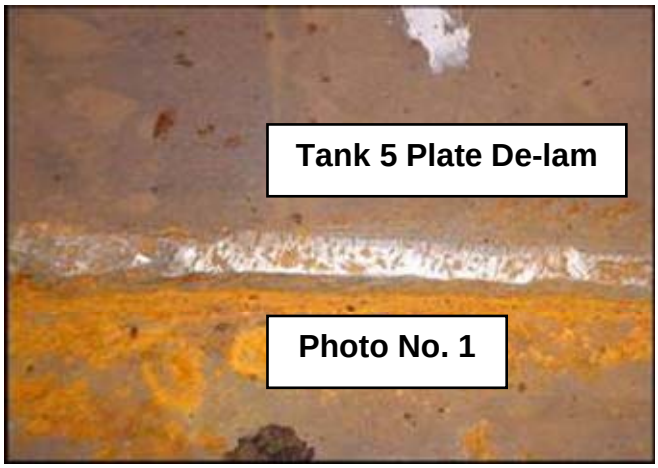
Concern: "Plate lamination.[19] Many of the plates used for the floor had lamination. No NDE [nondestructive examination] was done to determine the extent of the flaw. No assessment was done. The areas were just "ground out." This does not satisfy API 653-2.3.6."

ADEC Finding: "API 653-2.3.6 is only for shell course lamination. No section of API 653 can be found relating to ***FLOOR*** plates lamination."

Analysis: ADEC restricts their analysis to the specific language of API 653, Section 2.3.6, but does not answer the more important questions: (1) were there defects in the material used to repair the tank floors, and (2) could the use of poor quality material increase the oil spill risk? Several people interviewed for this report are still concerned poor quality metal was used to replace the Tank 5 floor. It is alleged that laminations in the floor plates were found and ground out. Some amount of "patch" welding was completed to repair the more serious laminations. It is alleged that repaired areas of the new floor were not tested to ensure adequate thickness and integrity prior to returning Tank 5 to service; however, APSC disputes this claim.

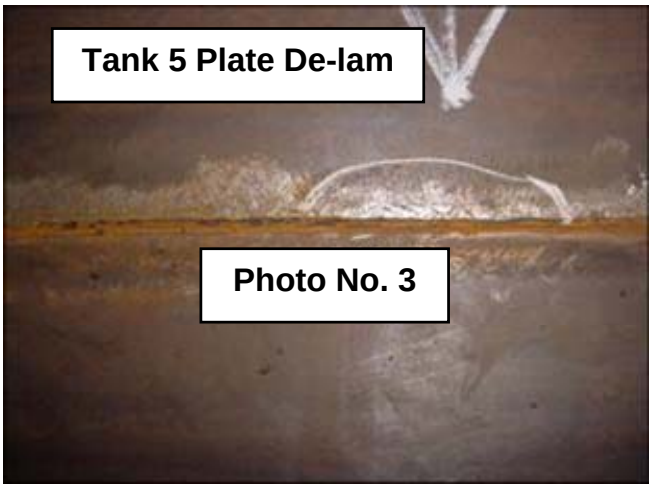
[19] A lamination is a metal defect with separation or weakness generally aligned parallel to the worked surface of the metal. A lamination may be the result of pipe blisters, seams, inclusions, or other manufacturing defects.

Interview with JPO: Mr. Harrison (JPO) explained that JPO and ADEC received a complaint about laminations in the metal used to repair the tank floors. The complaint alleged the laminations were shaved out of the metal surface and nondestructive testing was not completed to ensure adequate metal thickness before using the material to repair/replace the tank floors. Mr. Harrison said laminations were found in the metal that was used to repair the Tank 5 and 93's floors. He explained that when the metal is rolled out at the factory, sometimes marks and irregularities are left in the top of the sheet. He said the metal used to repair the tank floors must be a certain thickness. When a lamination is removed by grinding and sanding, after the floor is laid down, this reduces the thickness of the floor and there is no way of ensuring the final remaining thickness is adequate without completing UT. By the time Mr. Harrison went into Tank 5, the laminations were ground out. Mr. Harrison said ADEC had their engineer, Saengsudham, review the allegation. Mr. Saengsudham concluded nondestructive testing was not required for the tank floor laminations. Mr. Harrison was concerned about this conclusion because significant lamination repair can result in a thinner metal.



Confidential Source: One person said the metal that was used to repair the tank floors was the poorest they had ever seen in decades of experience repairing tank floors. The metal surface had hundreds of imperfections/laminations. This source alleges APSC told the welders to weld metal over the laminations to cover them up, and the defects were never integrity tested after the repairs were made.

Photos shown were brought to ADEC by a concerned employee. The employee took the photos, labeled them and provided them to ADEC to document the laminations. Labels were not altered for this report; except to enlarge them slightly for better readability. The photos are shown as part of the historical record. This report does not affirm that these photos actually depict plate delamination.



Records: API Inspector Lane's August 24, 2002 API 653 report concluded:

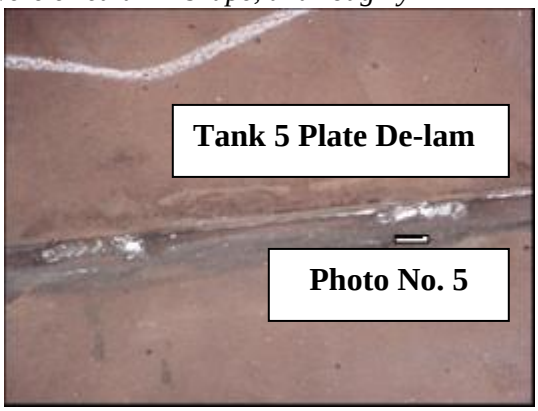
> *A total of **84** plates showed areas of delaminations. Sketches of floor plates in question [were] drawn up and submitted to engineering for follow up.*

Yet, a November 19, 2002 letter from APSC

to JPO[20] reported delamination on nine (9) floor plates; not 84.

An internal APSC engineering report dated October 14, 2002 states:

> *Visual inspection noted laminations in nine bottom plates in Tank 5. Indications were approximately 1" to 2" long by ¼" wide by 1/32" deep and occurred along the edges of the plates. Two additional laminations were observed on the annular plate of Tank 5. These were uncovered during abrasive blasting operations conducted in preparation for coating. They were located in the middle of the plate, were circular in shape, and roughly 1" in diameter.*
>
> *Per Section 3.4, API 650 requires all bottom plate[s] [to] have a minimum thickness of ¼-inch and comply with the requirements of Section 2.2.1.2. The design documents and technical specifications included in the X052 Issued for Construction engineering package reference the API 650 standard and list material requirements that mirror those contained in the standard. The materials used in the repairs of Tanks 5 and 55 conform to the requirements of Section 2, Materials, of API 650.*



> *Material test reports (MTRs) are included with each order of steel. Receipt inspection, conducted by the third party inspection company, Kakivik Asset Management, ensures that the steel received meets the requirements of the project design documents. Documentation of the conformance of tank repair materials to the project technical requirements is maintained in the project file.*

Author's note: APSC's 2002 report concludes that the steel was determined to be fit for use by a Kakivik Asset Management Inspector; however, it was a KAM Inspector that raised the concern about the floor delamination.

The internal APSC engineering report dated October 14, 2002 goes on to state:

> *Following engineering disposition of the laminations, concerns were raised regarding other surface marks in Tank 5. A total of 83 plates were catalogued by the API 653 inspector as containing these surface marks which the inspector characterized as laminations. Subsequent evaluation by the Project Engineer, the Alyeska Welding Engineer, the Tank Implementation Lead, the API 653 Inspector, the Project Manager, and the Certified Welding Inspector determined that these indications were not laminations. Rather, they were surface marks associated with the rolling process by which plate is formed. The results of this evaluation were documented in an engineering report that resides in the project file.*
>
> *AWS [American Welding Society] A3.0:2001 defines a lamination as, "a type of discontinuity with separation or weakness generally aligned parallel with the worked surface of a metal." The steel for the tank bottom plate in tanks 5, 55 and 93 was specified under the American Society for Testing and Materials (ASTM) Standard A36,*

[20] November 19, letter from Rod Hanson (APSC) to Willie Harrison (Joint Pipeline Office), 2002 VMT Tank Program, Inspection Documented Unsatisfactory Conditions

Carbon Structural Steel. This specification draws upon ASTM A6, General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling, for the general requirements, material constraints, dimensional constraints, and finish of the plate steel. In Section 9, Quality, ASTM A6 states, "The material shall be free of injurious defects and shall have a workmanlike finish." Note 4 under this section states, "Unless otherwise specified, structural quality steels are normally furnished in the as-rolled condition and subjected to visual inspection by the manufacturer, Non-injurious surface or internal imperfections or both may be present in the steel as delivered and may require conditioning by the purchaser to improve the appearance of the steel or in preparation for welding, coating, or other further processing."

Based on these requirements, the laminations discovered in the steel were within the tolerances of the ASTM standards governing the plate manufacture. Given that over 106,000 ft^2 of steel bottom plate was installed in Tanks 5, 55 and 93, the extent of laminations was very minimal.

Summary of Findings: The allegation that defective materials were used to replace Tank 5's floor could not be substantiated based on the records provided for PWSRCAC review. Mr. Dr. Kuckertz (P.E., PWSRCAC) reviewed the Tank 5 records and does not remember seeing an engineering report in the project file, authored by the Project Engineer, the Alyeska Welding Engineer, the Tank Implementation Lead, the API 653 Inspector, the Project Manager, and the Certified Welding Inspector, which allegedly ruled out this concern. Ms. Harvey requested an opportunity to meet with APSC Engineering staff to review the engineering reports and discuss this concern further to bring it to resolution. Ms. Harvey was denied the opportunity to meet with the APSC engineer that worked on this tank floor replacement, and was denied further access to the APSC engineering records which were requested. Therefore, this issue could not be resolved. It is recommended that the engineering specifications for the tank floor material quality be reviewed and compared to the material delivery and quality control records. It is also recommended that PWSRCAC obtain and review the engineering report in the project file, authored by the Project Engineer, the Alyeska Welding Engineer, the Tank Implementation Lead, the API 653 Inspector, the Project Manager, and the Certified Welding Inspector, which allegedly ruled out this concern.

Additional records needed to verify floor material quality

Allegation No. 4 – Floor Quality Testing

Concern: "Just vacuum box testing of bottom plates is not adequate."

ADEC Finding: "This inspection method satisfies API 653-12.1.7 for welding. Since the floor was replaced, the latest edition of 650 and 653 should be applied. API 650, 5.3.3, and API 653, 12.1.7.1, allow just visual inspection and vacuum box testing for floor welding."

Analysis: While API 653 Section 12.1.7.1 does allow vacuum box testing as an approved method, the 2003 amendment to API Section 12.1.7.3 requires repaired sections of the floor be examined by magnetic particle method or the liquid penetrant method, in addition to vacuum box

and solution or a tracer gas and detector method. While section API Section 12.1.7.3 was not contained within the API standard when the tanks were inspected in 2002, it is currently industry practice to require magnetic particle method or the liquid penetrant method as an important quality control procedure for floor repairs. The inspector was aware of this improved technique and recommended it to APSC for implementation in 2002.

Inspectors Concerns: Inspector Lane's API 653 report states:

> *All areas showing floor delaminations should have been examined and tested both visually and by an NDT method to ensure no delaminations remain in the new floor plate.*

APSC's Response: An internal APSC engineering report dated October 14, 2002 explained the testing that was completed to repair these nine areas of delamination:

> *All significant laminations were repaired by adding low hydrogen weld metal to the affected area and then grinding the area smooth. No special examinations were performed on these areas as they fell within the area encompassed by the vacuum box and received a leak test application.*

Author's note: APSC Engineering only recognized nine (9) significant areas that they label "delaminations." The Kakivik Asset Management Inspectors document eighty four (84) areas of delamination. Although the APSC report concludes the nine (9) laminations were fixed and tested, this does not satisfy the inspector, because not all the laminations are addressed. APSC documentation made available to PWSRCAC, states that APSC engineers confirmed only 9 of the 84 areas were "true" laminations. However, this report was not available for PWSRCAC. APSC's lamination report should be made available to confirm this important discontinuity in the records.

The October 14, 2002 APSC engineering report goes on to say:

> *Visual inspection and leak testing using a vacuum box formed the basis on the NDE applies to the laminations. All laminations were visually inspected. All bottom plate laminations were, or will be, leak tested…Magnetic particle testing (MT) was used to evaluate the deepest lamination and was applied randomly to check the remaining laminations.*
>
> *All methods of examination are not necessarily the best for all indications. With respect to the laminations found on the bottom plate, all were within the examination area encompassed by the vacuum box testing. Taking all factors into consideration, examination based upon visual testing and leak testing and coupled with good welding practice, is effective and sufficient for the indications found.*
>
> *All bottom plate laminations discovered and presented to engineering were superficial. All were within the examination areas of the vacuum box method of examination (or in close proximity) and the type of indication to which vacuum box examination applies. All were visually examined by a qualified and certified individual. All laminations that required welding were repaired using a low-hydrogen welding procedure. The chemical and mechanical characteristics of the floor plate and/or annular plate base metal and the design conditions of the floor plate do not constitute a need for extraordinary techniques or an over abundance of different examination methods. None of the laminations were in the critical zone and the material of choice (i.e., A36 carbon steel) is not susceptible to cracking. The essential attributes that the floor plate must have to achieve its design*

> *requirements are 1) that it contain the project and 2) that it not have an area deficient by any means that would provide a leak path for the product. The application of the vacuum box technique coupled with visual examination and sound welding practice provide the level of attention needed to ensure a quality product.*

A more recent report by APSC (July 3, 2006) concludes:

> *Inspections identified what they considered to be floor plate laminations. The condition was brought to the attention of the X052 Project Management Team, which included two welding engineers. Some areas referred to as de-laminations were identified, corrected and accepted by inspections. Others were inspected through nondestructive examination and determined to be plate milling marks that are acceptable (the difference being, laminations have depth, milling marks do not; milling marks are cosmetic features).*

Findings: The API 653 inspection standard in place during the 2002 Tank 5 repair allowed for vacuum box testing as an approved method. APSC's report to JPO states that vacuum box testing was completed for the nine (9) laminations. Test results of the vacuum box testing of the nine (9) laminations were not available to PWSRCAC.

74 laminations not tested?

APSC Engineering concluded that the other 75 areas (84 laminations identified by the API 653 inspector vs. the nine (9) repaired and vacuum box testing) were determined not to be laminations. The remaining 75 areas did not receive vacuum box testing, according to the records available to PWSRCAC.

Report investigating the Tank 5 lamination concern should be obtained.

In 2003, API upgraded its method for floor inspection to include Section 12.1.7.3 which requires repaired sections of the floor to be examined by magnetic particle method or the liquid penetrant method, in addition to vacuum box and solution or a tracer gas and detector method. While the 2003 method was not an API 653 requirement in 2002, the API 653 Inspector did specifically recommendation this additional testing. APSC states there is an engineering report in the project file which allegedly ruled out this concern in the Tank 5 records; this report was not available to PWSRCAC. Requests to meet with APSC engineering were denied.

Allegation No. 5 – Annular Plate Inspection

Concern: "Annular plate[21] was not 100% inspected."

[21] The annular ring sits at the bottom of the storage tank and connects the tank shell plates to the tank bottom. The annular plate typically rests on a crushed stone or concrete ring wall, and joins the shell of the tank to the bottom plates. The bottom plates are set on the tank pad or foundation. The annular ring takes most of the tank bottom stress. The annular plate-to-shell junction is subjected to high stresses, because the annular plate tends restrains the radial changes in the tank shell dimensions due to both hydrostatic pressure loads and temperature. The annular plate rests on a rigid foundation restraining the rotation of the shell subjecting the annular plate and junction weld to high bending stresses. The rigidity of the foundation determines, for the most part, the restraint to rotation at the junction.

ADEC Finding: "API 653 does not specifically call for an entire plate scan. However, records indicated that a 100% inspection was done."

Finding: The 2002 API 653 report for Tank 5[22] shows the Annular Ring was 100% inspected using manual ultrasonic testing (MUT). This concern was not substantiated.

Annular Ring was 100% tested

Allegation No. 6 – Annular Plate Inspection After Back-Gouging

Concern: "Annular plate was not being NDE [nondestructive examination] after "back-gouging."[23]

ADEC Finding: "API 653-12.1.5 has provisions for back-gouged of shell-to-shell welding, not bottom plates."

Analysis: The 2002 API 653 report for Tank 5[24] shows an unsatisfactory finding for the lack of magnetic particle examination of annular ring back-gouging:

> *Tank 5 floor removal involved gouging off old floor from annular ring. X052-T-411 Sec. 3.7.2 required magnetic particle examination of all back-gouging. This examination was not performed.*

A July 16, 2002 inspection finding by KAM Inspector Mr. Isensee[25] states:

> *TK-5 NDE not performed after old floor removal by arc-gouging. Refer to T-411 3.7.2.1.*

In response to an inquiry from ADEC about whether or not back-gouging occurred on Tank 5, APSC responded:

> *With regards to tank bottoms (i.e., bottom plate-to-bottom plate welds and bottom plate-to-annular plate welds) no back-gouging was performed.*

Findings: Further investigation is required. While Section 12.1.5 does refer to shell plate to plate welds, it does specify that for plate thicknesses greater than 1 inch, the back-gouged surface of the root pass and final pass (each side) should be examined for its complete length by magnetic particle or liquid penetrant methods. It is not clear why this would be an appropriate method for shell back-gouging and

Back-gouging?
Two Inspectors "yes"
APSC "no"

[22] August 24, 2002, API 653 Inspection Report, X052 Storage Tank 54-TK-5, prepared by Lead KAM Inspector, Lynn Lane, API 653 certified inspector No. 1264 for APSC.
[23] Back gouging is defined as the removal of weld metal and base metal from the weld root side of a welded joint to facilitate complete fusion and complete joint penetration upon subsequent welding from that side.
[24] August 24, 2002, API 653 Inspection Report, X052 Storage Tank 54-TK-5, prepared by Lead KAM Inspector, Lynn Lane, API 653 certified inspector No. 1264 for APSC.
[25] November 19, letter from Rod Hanson (APSC) to Willie Harrison (Joint Pipeline Office), 2002 VMT Tank Program, Inspection Documented Unsatisfactory Conditions

not for annular ring back-gouging.

It is not clear why two API 653 Inspectors concluded that Tank 5 floor removal involved back-gouging and APSC reports just the opposite.

More importantly, the inspectors documented the requirement to test back-gouged areas with magnetic particle or liquid penetrant methods was required in APSC's own procedures for the 2002 Tank Repair Project, Manual *X052-T-411 Sec. 3.7.2. A welding expert's opinion and a*dditional data is needed to resolve this allegation.

Allegation No. 7 – Tank Shell Testing Requirements

Concern: "API 653 requires UT [ultrasonic testing] (internally and externally) of all shell course quadrants during an internal inspection."[26]

ADEC Finding: "API 653 does not mandate an UT [ultrasonic testing] inspection during an internal inspection. Regarding the shell courses, the intent on an internal inspection is to ensure that there is no significant general wall loss and to gather enough information and to perform shell integrity assessments, if needed."

Analysis: API 653 requires UT readings to be obtained from the outside of the tank shell during the external tank inspection. External tank inspections are required every five years by the VMT C-plan. Internal tank inspections are required every ten years by the VMT C-plan. Therefore, both an internal and external inspection of Tank 5 was due in 2002.

For efficiency, the internal and external tank inspections are typically completed at the same time once every ten years. API Section 6.3.3.3 allows an internal inspection of the tank shell to be substituted for a program of external ultrasonic thickness measurement if the internal inspection is completed at or before the next external inspection is due.

In the case of Tank 5, the Authorized Inspector report documents his inability to conduct a complete internal tank shell inspection, due to the lack of equipment and oil remaining on the tank walls.

> *Only the first shell course was clean enough for visual inspection as the remaining shell courses were not clean enough for inspection as they showed and contained remains of product that has not been removed for inspection purposes. Also, it should be noted that there was no access available to inspect the upper shell course other than the 1st shell course.*

[26] The term shell refers to the tank wall. A shell course is a tank wall layer. Tank 5 has eight shell courses starting from No. 1 on the ground to No. 8 at the roof line. Tank 5 is 250' in diameter and 62' 3" tall. Typically each shell course for very large storage tanks is divided into at least four quadrants (north, south, east and west), and a minimum of corrosion measurements are taken to look for problem areas and to identify if any additional testing is needed.

> *The shell was externally inspected to the extent as to what could be visually inspected while walking around the tank from the ground…thickness readings were taken on each shell course only in the area that could be reached from external stairway.*

Conclusion: Tank cleaning and inspector access should have been afforded to improve the inspection quality for this tank's shell, especially since roof corrosion was indicated by external UT readings; indicating upper shell course corrosion may be present. While API 653 inspection does not mandate UT inspection of the shell during an internal tank inspection, this is a discretionary call which can be made by the Authorized Inspector to ensure an adequate inspection. Alternatively, and at a minimum, the inspector should have been provided a clean tank and equipment to complete his inspection. Additionally, external UT readings only at one point outside the shell (made as the inspector is climbing the tank stairs) may not be a sufficient set of data for a tank this size. Tank 5 is 250' in diameter and 62' 3" tall. Typically each shell course for very large storage tanks is divided into at least four quadrants (north, south, east and west), and a minimum of corrosion measurements are taken at each quadrant. Although quadrant measurements are not required by API 653, the number of data collection points is a discretionary call made by the inspector. It is reasonable for an inspection to find one data point per shell course to be insufficient for this size tank.

Inspector reports inability to complete internal tank shell and roof support inspection

The Authorized Inspector's report provided critical data to enhance the inspector's concern and understanding of why the recommendation was made to obtain UT data. This situation highlights the need for PWSRCAC to review the original API 653 tank inspection report signed by the Authorized Inspector, rather than a summary of the reports prepared by APSC, since much of the critical data identified from the AI report was excluded from the summary report provided to PWSRCAC.

UT data on the tank shell can be obtained from outside the tank without having to take the tank out of service. An external tank inspection for Tank 5 is due in 2007. Close attention should be paid to the shell corrosion rate data collected in light of the concerns raised during this last inspection.

Allegation No. 8 – Welding of Floor to Annular Ring

Concern: "Lapping of floor plates ("3 plate rule")."

ADEC Finding: "Not an issue. DEC agrees with APSC regarding their interpretation."

Analysis: On July 13, 2002, KAM Inspector, Mr. Isensee, writes Mr. Marchesani (APSC):

> *This AM it has come to our attention that at 5 separate locations on the completed bottom plate to annular welds the 12" three plate overlap rule requirement has not been complied with.*
>
> *Bottom plates 2& 3 intersecting with annulars A-32 & A-33*
> *Bottom plates 41 & 42 intersecting with annulars A-5 & A-6*
> *Bottom plates 60 & 61 intersecting with annulars A-6 & A-7*
> *Bottom plates 198 & 199 intersecting with annulars A-13 & A-14*
> *Bottom plates 213 & 214 intersecting with annulars A-15 & A-16*

One day later, on July 14, 2002, Mr. Marchesani (APSC) writes back:

> *Alyeska addresses this issue with the following interpretation of the API 653 three plate overlap rule: the reference to 3-plate laps, and tolerance with them, reside in figure 3 and section 3.3.1(2) of specification X052-T-411. Figure 3 is lifted from API 653. In either case (API 653 or X052-T-411), the reference for tolerances to a 3-plate lap are associated with patching of an existing tank floor. The specification and code are written to prevent additional welding (such as patches) close to the intersection of three floor plates (i.e., a 3-plate lap) as such a condition would create areas of high stiffness (and thus stress) within the floor.*
>
> *We are not installing any patches in Tank 5. Rather we are installing an entirely new floor (please also note that X052-T-411, API 653, and API 650 differentiate between ¼-in floor plate and annular plate). As such, the sections of X052-T-411 and API 653 referencing 3-plate laps do not apply to the situation you present below. API 653 does suggest that when performing a complete replacement of the tank floor plate, that the installation of tank floor plate conform to API 650. API 650 contains no limitations for the distance between the intersection of sketch plate-to-sketch plate fillet welds and an annular plate-to-annular plate butt weld.*

Apparently KAM Inspector, Mr. Isensee, did not agree with APSC's interpretation of the API 650 3-plate rule because on July 16, 2002, Mr. Isensee logged an unsatisfactory finding, citing the API 650 standard:

TK-5, 3 Plate overlap 12" rule –bottom to annular- refer to API-650 Section 3.1.5.4.

Another KAM Inspector also concluded that APSC's interpretation of the 3-plate rule was incorrect. An August 24, 2006 API 653 tank inspection report prepared by API 653 inspector, Mr. Lane, concluded that welds made in the floor plates do not conform to the API 650, Section 3.1.5.4, 3 plate rule.

Tank 5, (3 plate rule) five individual

> *locations were found where the floor plates were welded either directly over butt welds in the annular ring or within the 12" restricted area.*

Photos showing the 3-plate lap concerns were brought to ADEC by a concerned employee. The employee took the photos, labeled them and provided them to ADEC to document the laminations. Labels were not altered for this report; except to enlarge them slightly for better readability.

Finding: Dr. Kuckertz (P.E., PWSRCAC Staff)[27] reviewed this issue with APSC, and concluded the 3 plate rule did not apply to the situation in Tank 5's floor. However, it may be prudent to refer this recommendation to a welding expert for confirmation.

Refer to expert

Allegation No. 9 – Tank Nameplate

Concern: "No nameplate on Tank 5."

ADEC Finding: "New construction standards should only be applied to the new tank bottom, and not shell. Therefore, API 653 does not require a new name plate for an existing tank (shells)."

Analysis: Safety, security and operating procedures rely on the appropriate labeling of facility components.

Finding: A name plate for each tank is a minimum professional standard for a storage terminal. While API 653 may not require a name plate on an old tank, it is just common sense.

Allegation No. 10 – Heat Treatment of Metal on Access Door Area

Concern: "Post weld heat treatment on access door. API 653 requires that anything over 1" should be heat treated - or at the approval of the engineer."

ADEC Finding: "There is no relevant reference regarding post weld heat treatment in API 653. This is dependent upon whether a heat treatment is required under the WPS qualified per ASME Section IX. APSC records indicate that no post weld heat treatment is required (verified by an APSC welding engineer)."

Analysis: Post Weld Heat Treatment is a heat treatment done after welding to improve the chemical mechanical properties of weld surfaces. There are many post weld treatment methods, however, for steel the most common use is to relieve stress after welding a large section. A company that provides Post Weld Heat Treatment Services summarizes the need for post weld treatment:[28]

> *The base material near the weld metal and the heat-affected zones transform through various metallurgical phases. Depending upon the chemistry of the metals in their areas,*

[27] Ms. Harvey did not complete an independent assessment of the floor plate lapping concern.

[28] Post Weld Heat Treatment Services; http://www.industrial-inspection.in/pwht.htm

hardening occurs in various degrees, depending mainly upon the carbon content. This is particularly very true in the heat - affected zone adjacent to the weld metal deposit. The resultant stresses are highest due to melting and solidification. Stress, due to welding is of magnitude roughly equal to the yield strength of the base material.

Stress Relieving is done by uniformly heating- fabricated equipment or the vessel or vessel part to a sufficiently high temperature, but below the lower transformation temperature range, then subjecting it to a thermal retardation for a sufficient time depending upon the material thickness and then finally uniformly cooling it which is also of utmost importance.

Advantages of Post Weld Heat Treatment - Stress Relieving

- *A much greater dimensional stability is obtained and maintained*
- *The potential of stress induce cracking is reduced.*
- *Metallurgical structure is improved.*
- *Strength of the Material and Life of the equipment is Enhanced.*

Finding: This concern should be reviewed by a welding expert.

Refer to expert

Allegation No. 11 – Joint Design on Access Door Area

Concern: "Change of joint design on access door was not appropriately approved by a qualified engineer. (Assume this is UNSAT #17)"

ADEC Finding: "There is no explicit requirement in API 653. ASME Section IX, Table QW-253 lists joint groove design change as NONESSENTIAL (e.g. changes are OK). The change was reviewed by a licensed PE and an APSC welding engineer."

Finding: There is insufficient information available to PWSRCAC to review the joint design and draw a conclusion. Additional information is required. This allegation should be reviewed by the welding expert.

Refer to expert

Allegation No. 12 – Roof Support Column Inspection

Concern: "Minimal UTing of roof support columns (This issue was identified during the investigation of the original concern)"

ADEC Finding: "Not an issue."

This concern was substantiated. API 653 Inspector required internal roof support column inspection; it was not completed.

Analysis: The analysis of this concern is described in Allegation No. 7, Section 4.8 of this Report.

Finding: The API 653 inspector recommended that the roof column supports be inspected, and reports he was not provided equipment or access to the upper sections of the roof supports to complete this inspection.

Valdez Marine Terminal

Tank 16

Alleged Integrity Concerns Preliminary Investigation

Report Requested by:
the Prince William Regional Citizens' Advisory Council

Prepared by:
Harvey Consulting, LLC.

December 20, 2006
Revision No. 1

March 13, 2007
Revision No. 2

Executive Summary

Prince William Sound Regional Citizens Advisory Council (PWSRCAC) requested Harvey Consulting, LLC's assistance to investigate the alleged tank integrity issues for Valdez Marine Terminal (VMT) Tank Number 16 (Tank 16). PWSRCAC received letters from Chuck Hamel in May, 2006, requesting the council investigate tank integrity issues on Tank 16, which along with other tanks were inspected and repaired in 2002. PWSRCAC requested Harvey Consulting review Alyeska Pipeline Service Company (APSC) records, agency records, and meet with concerned individuals to better understand the scope of the allegations and make a recommendation for further action by PWSRCAC. This report summarizes the work completed by Harvey Consulting, LLC in the course of completing a preliminary investigation on the alleged Tank 16 integrity concerns.

Concerns originally arose during the 2002 Tank 16 inspection and repair work when employees and inspectors noticed tank floor damage in the area of the sump that put the integrity of the tank floor in question. It was alleged that the floor buckling was so significant that the sump was removed. The floor was patched to cover the hole left after the sump was removed. Not only were there problems with the tank floor around the sump, but Tank 16's floor had historically been patched in a number of places, and required more patching in 2002, contributing to the integrity concerns. Of particular concern was the potential for ground water and soil contamination from the crude oil stored in Tank 16.

There were a number of inconsistencies in the 2002 Tank 16 records. JPO confirmed Tank 16 floor leak allegation was reported to ADEC and JPO. Yet, ADEC shows no record of this allegation. Requests for additional documentation from ADEC and a meeting were denied. In May of 2006, PWSRCAC only requested APSC to provide records relating to Tank 16 welds, because PWSRCAC was not aware of concerns about tank floor deformation around the sump and potential for contamination. Requests for additional documentation from APSC and additional meetings were recommended by Harvey Consulting, LLC, but have not been requested by PWSRCAC to date. Requests made by Harvey Consulting, LLC for meetings with current and former ADEC staff to discuss the Tank 16 records were denied. However, Ms. Lewis (ADEC) did confirm:

> *There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.*[1]

[1] August 30, 2006 e-mail from Ms. Lewis (ADEC) to Ms. Harvey (PWSRCAC) copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses.

Potential for groundwater and soil contamination is a serious allegation. There is insufficient information provided by the concerned employees, agencies, or APSC to confirm or refute this allegation. It is recommended that PWSRCAC pursue additional information from the agencies and APSC to better understand this allegation. If the allegation is substantiated, soil remediation below Tank 16 may be required. However, it is important to note that there is a secondary containment liner made of catalytically blown asphalt under the entire Tank 16 area. If there was a leak through the Tank 16 floor, it should have been contained within the existing secondary containment area. It is unlikely that there would be a leak in both the tank floor and the secondary containment, and therefore the risk of wide-spread environmental contamination should be low.

Tank 16 is the only tank currently operating in the West Tank Farm of the VMT. The maximum tank capacity is 535,000 barrels of crude oil. Unlike the West Tank Farm tanks, which have been upgraded, Tank 16 has the existing 1976 tank floor and no cathodic protection. Additionally, the Tank has well over a 100 patches in the tank floor. It is recommended that PWSRCAC work with APSC to have the Tank 16 floor replaced and cathodic protection installed, if APSC plans to use Tank 16 long term. When the tank floor is upgraded, any soil contaminated found can be addressed at that time.

Information Available For This Report

Very few sources of written records were available for this report. In response to letters from Chuck Hamel requesting the council investigate tank integrity issues on Tank 16, PWSRCAC requested records from ADEC and JPO. ADEC and JPO provided physical copies of letters via U.S. Mail; however, these records essentially denied any Tank 16 welding concerns from the 2002 timeframe. In May, 2006, PWSRCAC requested an opportunity to review APSC Tank 16 records from the 2002 timeframe. In June, 2006, PWSRCAC was provided two opportunities to visit APSC's Anchorage office to read and take notes from the Tank 16 files, but not photocopy the records.[2] In September, 2006, APSC provided a copy of their July 3, 2006, report entitled 2002 Valdez Tank Project Review. In October, 2006 APSC provided some additional information to PWSRCAC President Stan Stephens.

JPO confirmed employees filed Tank 16 concerns in 2002

Due to time constraints for the review of the APSC records, only a very cursory review of the Tank 16 records was possible. Attempts to set up additional meetings with APSC Engineering and ADEC to obtain additional engineering records were denied. A written request for additional agency records was prepared by Harvey Consulting, LLC for PWSRCAC in June, 2006, but was not sent (Attachment No.1).

[2] June 14, 2006 and June 20, 2006

Allegation In Detail

Employees working at the VMT during the 2002 Tank 16 inspection and repair work allege that Tank 16's floor was buckled around the sump area. It was alleged that the floor buckling was so significant that the sump was removed. The floor was patched to cover the hole left after the sump was removed. It was also alleged that tank floor deformation around the sump may have caused a leak, and ground water and soil beneath the tank may have been contaminated with crude oil.

In late 2002, ADEC started an investigation into the allegations raised during the 2002 VMT Tank Inspection and Repair Program. On April 25, 2003, ADEC issued a findings document summarizing the results of their investigation.[3] This report does not show any Tank 16 allegations or investigation. The lack of ADEC documentation on the Tank 16 concerns was puzzling because Mr. Harrison (JPO Employee Concerns Program Supervisor) confirmed JPO and ADEC had received a complaint about a potential Tank 16 floor leak due to the floor buckling around the sump which may have caused leaks into the water and soil beneath the tank.

Background

According to industry standard API No. 653 tanks are typically internally inspected at least once every decade, unless tank integrity history or risk indicate a different interval. The last Tank 16 internal inspection was completed in 1993.[4] This inspection showed some degradation of the tank floor requiring 69 sections of the floor to be repaired. The annular plate did not require repair. Column reinforcement pads were installed below each roof support column. The entire tank bottom, shell, and columns were grit-blasted and a new coating of Devoe Bar-Rust 236 was applied to the tank floor and to a height of 3 feet on the shell.

In a letter to the JPO dated March 30, 1999, Alyeska committed to upgrade Tank 16 with cathodic protection during the next internal tank inspection:[5]

> *If the West Tank Farm Tanks 15, 16, 17 and 18 are not removed from service, they will have CP systems installed at their next scheduled internal inspection.*

However, a May 14, 2002, letter from APSC to ADEC and JPO rescinded the 1999 commitment to install the cathodic protection in Tank 16:[6]

[3] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.
[4] April 10, 2002 Memorandum from Robert Penland (Corrosion engineer Corrpor Companies, Inc.) to Gary Ray (Alyeska Systems Integrity) Tank 55-TK-16- API 653 5-yr. Inspection Review.
[5] APSC Letter no. 99-14249

APSC rescinds commitment to install cathodic protection in Tank 16

We believe Alyeska should be allowed to inspect, repair and return these tanks [referring to all West Tank Farm Tanks 15, 16, 17, and 18] without the additional requirement of installing cathodic protection. Subsequent inspection cycles would be based on the remaining floor thickness of the tank as it is returned to service and projected corrosion rates. Part of our rationale is that there is no regulatory basis to compel the prior commitment that these tanks are likely to be removed from service in the not too distant future because of declining crude oil production on the Alaska North Slope and the corresponding need for Alyeska to continue to drive unnecessary costs out of our business. At stake are several million dollars."

A Tank 16 internal inspection was due in year 2003; however, it was accelerated to year 2002 in response to concerns from the JPO and the State Fire Marshall. The agencies requested APSC to clean Tank 16 to remove sediment, which had accumulated in the bottom of the tank because it may be plugging the fire foam system located near the bottom of the tank. The agencies also recommended installation of a cathodic protection system. APSC determined it was economical to accelerate the 2003 internal tank inspection to 2002, because Tank 16 was already taken out of service for sediment removal. APSC did not agree to install a new cathodic protection system as part of the 2002 work.

By year 2002, all of the VMT East Tank Farm tanks had new tank floors and a cathodic protection system installed. In 2002, Tank 16 still had the original 1976 tank floor installed with no cathodic protection.

During the summer of 2002, Tank 16 was cleaned, inspected, repaired, and returned to service.

Today, Tank 16 still has the original 1976 tank floor with no cathodic protection.

Chronology of Events

This section provides a brief chronology of events associated with the inspection and repair work completed on Tank 16 and subsequent investigation into employee(s) allegations.

March 14, 2002

[6] May 14, 2002 Letter from Rod Hanson (APSC) to Bonnie Friedman (ADEC) and John Kerrigan (JPO) and Jerry Brossia (JPO), Crude Tank Inspections – West Tank Farm, Valdez Marine Terminal

A letter from APSC notified ADEC that Tank 16 would be taken out of service in April, 2002, for cleaning and would remain out of service for the rest of Year 2002.[7]

May 14, 2002
A letter from APSC notified ADEC that Tank 16 would be cleaned and inspected in 2002.[8] The plan was to remove sediment and inspect the tank bottom. Based on the Tank 16 floor inspection results, APSC would either return it to service with an appropriate inspection schedule, or repair the tank and place it in "warm" standby.

June 7, 2002
Mr. Hisey (APSC CEO) and Mr. Wight (APSC) meet with Mr. Brossia (JPO) and Mr. Kerrigan (JPO) to discuss APSC's proposal for delaying Tank 16's cleaning and inspection.

June 20, 2002
JPO letter sent to APSC stating Tank 16's cleaning and inspection could not be delayed. JPO's letter also reiterated the value of cathodic protection:

> *After careful consideration of impacts on sludge build-up over the fire foam system and the effectiveness of cathodic protection, we still believe this tank should be cleaned and repaired this year. The West Tank Farm is a critical asset during loading conditions to maintain North Slope production and TAPS throughput.*

JPO reiterates support for cathodic protection benefits

Summer and Fall 2002
Tank 16 was cleaned, inspected, repaired. It is not clear exactly when Tank 16 was returned to service, but it appears that it was sometime during the Fall of 2002. The return to service date would need to be verified with the operator, APSC.

Sump was replaced due to plate deformation

October 1, 2002
Mr. Harrison (JPO) and Ms. Friedman (ADEC) met with a concerned employee. The employee was working at the VMT and alleged that there might be a leak in Tank 16's floor. In a 2006 interview Mr. Harrison said the employee brought groundwater samples to the October 1, 2006, meeting. The employee claimed the water sample had been obtained from the Tank 16 repair job in the location where the sump had been removed. The employee alleged groundwater running under Tank 16 caused the floor to buckle in the area around the sump. It was alleged there was dark soil under the tank when the sump was removed to repair

[7] March 14, 2002 Letter from Rod Hanson (APSC) to ADEC's Fairbanks Office, Valdez Marine Terminal – Tank Cleaning Notification, Letter No. 02-18308.
[8] May 14, 2002 Letter from Rod Hanson (APSC) to Bonnie Friedman (ADEC) and John Kerrigan (JPO) and Jerry Brossia (JPO), Crude Tank Inspections – West Tank Farm, Valdez Marine Terminal

the floor. According to Mr. Harrison, Mr. Moore (APSC) also obtained and tested samples from the Tank 16 sump area, reporting no contamination. Mr. Harrison said he had not handled the sample or testing; this was all handled by ADEC and he never actually saw the test results, but was told that the tests were negative for contamination by Ms. Friedman. Attempts to interview ADEC staff about this meeting, or water samples, were denied.

November 19, 2002
Due to the number of employee concerns on the 2002 tank inspection and repair work, JPO requested APSC to provide a list of unsatisfactory conditions on all tanks repaired during 2002. On November 19, 2002, APSC provided JPO a list of unsatisfactory conditions documented by the inspectors; there were no Tank 16 inspection issues listed.[9]

December 20, 2002
A letter from APSC to ADEC confirms that sediment was removed from Tank 16 and the tank floor bottom was inspected, repaired, and returned to service.[10]

January 21, 2003
An internal APSC memorandum from Ms. Lee (APSC) to Mr. Stokes (APSC) summarized the 2002 inspection findings for Tank 16. The report states that 80 floor plate patches were installed on 49 of the original floor plates. There are 260 original tank floor plates; 49 plate repairs out of 260 is approximately 19% of the total tank floor. The report confirms the entire sump was replaced due to deformation of some of the plates.

April 9, 2003
A letter from APSC to ADEC shows that the state hired a consultant to look at Tank 16's inspection data.[11] The letter states:

> *The Alyeska Tank Steward has had discussions with the State's Tank Program consultant regarding information on the Tank 16 data summary report.*

May 2006 (various dates)
Concerns raised by Chuck Hamel and Glen Plumlee on Tank 16 integrity.

May 23, 2006
PWSRCAC submitted a public records request to ADEC requiring all the tank inspection and repair records on Tank 16 since 2000.

June 19, 2006
ADEC replied to PWSRCAC's May 23, 2006, public record request stating:

[9] APSC Letter no. 02-19302
[10] APSC Letter No. 03-19430
[11] April 9, 2003 letter from Mr. Hoffman (APSC) to Ms. Friedman (APSC), Revised Tank 16 Data Summary Report.

Please note that concerns with Tank 16 were not raised to ADEC during our 2002/2003 investigation.

July 3, 2006

In response to concerns raised by Mr. Hamel on Tank 16, APSC reviewed the Tank 16 records for APSC President, Mr. Hostler. APSC's July 3, 2006, report to Mr. Hostler concludes:[12]

Tank 16 was removed from service for internal inspection in the fall of 2002. Floor plate patches were installed and sump repairs were made and the tank returned to service near the end of the year. There was no door sheet cut for Tank 16 and therefore no cutting or welding of the tank shell was performed. Tank 16 was returned to service in later 2002 and has since remained in service.

Thorough review of the inspection records and PassPort Work Order documentation did not reveal any welding issues identified with the 2002 Tank 16 work.

There are no work process irregularities identified or eluded to in the Tank 16 documentation.

There were no integrity issues discovered during review of the 2002 Tank 16 repair documentation.

Alleged integrity issues identified in recent correspondence included:

1. *Faulty welding in the lowest rings of TK-16 (5/9/06 letter)*
   There was no door sheet cut in Tank 16 and subsequently, no welding on the tank shell course (rings).

2. *Which APSC engineer accepted welds in TK-16*
   Welds accepted by inspection, there appeared to be no need to address any specific welding issues to engineering.

August 2006 (various dates)

Ms. Harvey (Harvey Consulting, LLC) interviewed Mr. Harrison (JPO).

Ms. Harvey interviewed employee(s) that worked on VMT 2002 tank inspection and repair work; who confirmed the Tank 16 floor around the sump was buckled and that employee(s) reported concerns of potential groundwater and soil contamination to JPO and ADEC.

[12] July 3, 2006 APSC internal report to APSC President Kevin Hostler, 2002 Valdez Tank Project Review July 3, 2006.

Confidentiality was requested due to fears of retaliation for speaking about what happened on Tank 16 in 2002.

Harvey Consulting, LLC made a request to meet Bonnie Friedman (previous ADEC employee), Sam Sangsudam (ADEC) and Becky Lewis (ADEC). Requests for meetings were denied.

August 30, 2006
On August 30, 2006 , Ms. Lewis wrote to Ms. Harvey, copying this memo to ADEC Management and the ADEC Environmental Crimes investigator Mr. Moses:

ADEC declines meeting and records on Tank 16 due to current state investigation

This email is in response to your request this afternoon that Sam Saengsudham and I meet with you on Friday, September 1, 2006 to discuss PWS RCAC's investigation into the Chuck Hamel allegations made in May of 2006 concerning several tanks at the Valdez Marine Terminal (VMT). We have decided not to meet with you at this time. There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.

October 30, 2006
On October 30, 2006, Mr. Jones (APSC Vice President) sent PWSRCAC additional information provided by the APSC engineering team on Tanks 55, and 16 in response to PWSRCAC's preliminary findings.[13] The Tank 16 response confirms that Tank 16's floor, especially the area around the sump was damaged by water build-up underneath the tank; however, APSC maintains this damage was repaired and there was no resulting environmental impact. APSC provided the following information:

Question 3a: We understand your question to be how TK-16's buckled floor and raised sump was corrected.

Response: The floor plate on TK-16 was not buckled. Over the course of the tank's service life, rainwater seeped between the top of the ring wall and the annular plate. This water intrusion had over time resulted in water build-up between the floor and the secondary containment liner. When the tank was emptied and the sump was pumped dry, the resulting hydrostatic pressure of the water beneath the sump caused the empty sump to float thus distorting the surrounding floor plate.

The water beneath the floor was removed and routed to the industrial wastewater sewer. Distorted floor plate sections at the top edge of the sump and a concentric circle of the outer edge of the sump bottom were removed. Gravel beneath the sump edge was removed and the sump was returned to its original position. The sump floor was repaired and the sump was slurried in place.

[13] October 30, 2006 e-mail from Greg Jones (APSC) to Stan Stephens (PWSRCAC), Responses to PWSRCAC's Questions.

The cause of the condition was due to ground water hydrostatic pressure. The ground water was removed and floor and sump repositioned into their proper location.

Question 3b: We understand your question to be what happened to a sample of the substance below TK-16 floor that was sent to ADEC.

Response: We have no knowledge of a sample of the gravel or the ground water from beneath the TK-16 sump being collected and sent to ADEC.

Findings

The record on Tank 16 is confusing and inconsistent. Mr. Harris (JPO) and other confidential sources confirm that Tank 16 issues were raised to JPO and ADEC in 2002. ADEC hired a consultant to review the Tank 16 work in early 2003. Yet, in 2006 ADEC reports to PWSRCAC that it did not investigate Tank 16 concerns, but later denies an interview because the 2002 Tank 16 repair work is under investigation by the ADEC criminal investigator (Mr. Parrish).

APSC acknowledges tank floor distortion in the sump area, but maintains it was repaired with no environmental damage. APSC attributes the distortion to rainwater accumulation below the tank. However, there is no indication what steps were taken to prevent future water accumulation under Tank 16 (e.g. sealing around the tank ring wall). Additional water accumulation under the tank will contribute to tank floor corrosion, especially since this tank is not equipped with cathodic protection.

It is recommended that PWSRCAC pursue Tank 16 oversight. There are a number of inconsistencies in the records, and this potential for groundwater contamination is a serious allegation. Tank 16 is the only tank currently operating in the West Tank Farm of the VMT. Unlike the West Tank Farm tanks which have been upgraded, Tank 16 has the existing 1976 tank floor and no cathodic protection, as well as over 100 patches in the tank floor.

Attachment No.1

[PWSRCAC Letterhead]

June 30, 2006

Kurt Fredricksson
Commissioner
Alaska Department of Environmental Conservation
410 Willoughby Ave., Ste. 303
Post Office Box 111800
Juneau, AK 99811-1800

RE: Clarification of issues related to PWSRCAC public records request of May 24, 2006

Dear Mr. Fredricksson:

On June 19, 2006, the Alaska Department of Environmental Conservation (ADEC) responded to a request for publicly available records for the Valdez Marine Terminal (VMT) Tanks 5, 16, 55, and 93 submitted by Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) on May 24, 2006.

Background
The request for records was made as a follow-up on complaints received by PWSRCAC about the 2002 VMT Tank Inspection and Repair Program. It has been alleged that tank welds may not have been properly repaired or inspected before returning these tanks to hydrocarbon service. This matter was the subject of one or more whistleblower complaints to your office and the Joint Pipeline Office in 2002. This issue has been raised again, through another whistleblower complaint in 2006.

Your June 19, 2006 response to our request for information included both photocopies and digital versions of documents (on CD). Thank you for responding to our request.

Request for Additional Information
PWSRCAC has reviewed the hard copy and digital records provided. The documentation provided by ADEC raises a number of questions and concerns. This letter requests ADEC response to each concern, question, and information request outlined below. We request your response within ten (10) ten days of receipt of this letter, in accordance with the Freedom of Information Act (FOIA).

Most of our comments below are related to a table titled "Documents Withheld from the PWSRCAC Public Records Request concerning inspections and weld information for Valdez Marine Terminal Tanks

5, 16, 55, and 93" included with your July 19, 2006 letter. The table lists 30 documents withheld by ADEC using a "deliberative process" claim.

1. **Document was provided to APSC, but withheld from PWSRCAC.** Your June 19, 2006 letter listed one of the documents withheld as an April 21, 2002 letter from B. Friedman (ADEC) to APSC on the subject of "DRAFT Letter--Review of Employee Concerns for TKS 5, 55, 93." Your letter cites "deliberative process" as the basis for not providing a copy of this document to PWSRCAC.

    a. Was this April 21, 2002 document a summary of employee/whistleblower concerns compiled by B. Friedman on Tanks 5, 55 and 93? If so, why was this agency investigation into a whistleblower complaint shared with APSC in draft form on April 21, 2002?

    b. Why was this document not handled confidentially under the employee concerns program or under the whistleblower protection guidelines?

    c. If this document was provided to APSC on April 21, 2002, how can ADEC justify withholding this document from PWSRCAC as deliberative process? Please explain, or provide a copy of the document.

    d. Is the date on this document correct? The April 21, 2002 date appears inconsistent with all the other document dates which are later in the year. The other whistle blower interview notes are dated June and September 2002. Are there multiple complaints? Or is this a typographic error in the table? Please clarify.

2. **Inadequate documentation of whistleblower concerns.** There are a number of documents listed in the June 19, 2006 table related to whistleblower complaint(s). These documents are undated, evidently un-authored, and have no subject matter listed. While PWSRCAC recognizes the importance of protecting whistleblower identity, it is not clear why you did not identify the date or author, or provide the subject, for some documents. We were particularly concerned that the name of the state or federal investigator that authored each whistleblower report was missing. Dates of agency meetings and names of agency personnel who have authored reports are a matter of public record. The date, author, and subject information should not disclose the whistleblower identity and should thus be provided. Please provide this information or explain why it should be withheld.

    a. The table lists an undated memo from W. Harrison/JPO Employee Concerns Program (ECP) Specialist documenting allegations on Tank 55; however, there is no date provided for this document. Please provide this date.

    b. The table lists a June 29, 2002 e-mail, with a document description that says "S. Saengsudham/ADEC notes on email" where the author's and recipient's names are both withheld on the basis that this would identify a confidential source. We assume this would

have been a whistleblower complaint filed with the agency. Please provide the name of the agency representative that is listed as the recipient on the e-mail. Although the author would be protected under whistleblower protection, the agency personnel handling/receiving the complaints is a matter of public record. Please provide this information.

c. The table lists a June 30, 2002 e-mail where the author and recipient are both withheld due to deliberative process, not to protect a confidential source. Please provide the author and recipient names on this e-mail, as all e-mails contain this information.

d. The table lists an undated e-mail where the author and recipient are both withheld due to deliberative process, and not to protect a confidential source. Please provide the author and recipient names on this e-mail, as all e-mails contain this information.

e. Please verify if there were four separate complaints: (1) April 21, 2002; (2) June 29, 2002; (3) September 20, 2002; and (4) one other undated complaint.

f. Please verify who was assigned the lead role for the ADEC to investigate the whistleblower(s) complaints. Who was assigned the lead investigator role for the JPO?

g. We assume that the state and federal agencies keep detailed, well documented records on all whistleblower complaints. We did not see any formal agency reports issued in your list to document meetings with whistleblowers or other aspects of investigations. Since we assume that the agency would keep very precise records on such important matters, please also provide this the date, name, and subject matter for all reports and investigations produced by the agency on whistleblower allegations for the 2002 VMT Tanks Inspection and Repair Program. This data appears to be missing from your original response.

3. **Documents withheld with inadequate justification.** For 27 of the 30 documents listed as being withheld under deliberative process, we are unable to verify the "deliberative process" claim based on the information provided in the table. Many of the documents being withheld are un-dated, un-authored, and untitled. ADEC has provided insufficient information to describe the role the documents played in the deliberative process. In other cases only vague descriptions of the documents are given such as "handwritten notes" or "e-mail," thus providing insufficient basis for withholding these documents.

    a. Please provide these documents; or alternatively,

    b. Please provide dates, authors, and subject matter to complete this table with a detailed explanation supporting the basis for withholding the document under the deliberative process claim.

4. **Digital records provided appear incomplete or unreliable.** Many of the photographs provided in digital copy do not include a date, tank number, or location to aide us in identifying the tank or tank component. It is not possible for PWSRCAC to incorporate them in our review of weld-related concerns associated with the tanks in question.

   In addition, the digital records provided included tank inspection reports in Excel format. We did not find some of the complete, signed inspection reports in the data you provided. The reports on the CD are incomplete and unapproved. Our staff and consultants reviewed similar records at APSC's offices; however, they were not granted permission by APSC to make copies. We had hoped to obtain them from the agency. We know from reviewing APSC records that complete, signed copies of these reports are available. Please provide the final signed version of these weld inspection records, or explain why the agency did not think it was necessary to obtain final welding reports when investigating these whistleblower allegations.

   Finally, the July 16, 2006 list references a zip disk (undated) which cannot be read because of "No Zip Drive at JPO or ADEC," and two other disks are "not readable." It is not clear to PWSRCAC why important whistleblower investigation records would be kept in a computer format that is inaccessible to agency staff. These records are less than 4 years old. The technology should be readily available for reviewing these records. Again there is no data, no author and no recipient listed for these records. Did anyone at the agency ever review this data back in 2002? Was it submitted by a whistleblower? Or was this data developed as part of the agency's investigation?

   a. Please provide copies of all photos with labels, including date, tank number, and location on tank.

   b. Please indicate who took the photographs provided.

   c. How were these photographs used in your investigation and what conclusions did you draw from them? Is there a document that provided an analysis of these photos? We did not find one in the records you sent. Please provide that report.

   d. Please provide complete, signed copies of the inspection reports from the CD.

      a. Please provide PWSRCAC with access to the zip disk. We will be happy to arrange access to the necessary technology to access the information contained on it.

5. **Apparent blacking-out of notations.** In some of the documents provided as hard copy, including a memorandum from Alyeska to ADEC on October 14, 2002 and Procedure Quality Review documents, it appears that notes have been blacked out. PWSRCAC requests explanation for this measure, if, in fact, it is possible to confirm that the black markings are covering text on the

original document. If it is intended that these markings are referenced in the list of withheld documents, please provide more detailed information to this effect.

6. **Incomplete copy of October 14, 2002 memo.** ADEC files sent in response to our FOIA request include an October 14, 2002 memo (with an October 16, 2002 cover letter) from APSC to ADEC, addressing ADEC questions posed on October 11, 2002. It appears we were provided an incomplete copy of this important memo. Our copy includes the response to ADEC's questions up to "3f--What was the inspection methodology used with respect to laminations?" and no responses to the last three bullet points in the original ADEC letter of October 11, 2002. Please provide the complete copy of this response.

Thank you for very much for your assistance in this matter.

Sincerely,

John S. Devens, PhD
Executive Director

cc: Becky Lewis, ADEC/JPO
Gary Mendivil, ADEC
Donna Schantz
Tom Kuckertz

Valdez Marine Terminal

Tank 93

Alleged Integrity Concerns Preliminary Investigation

Report Requested by:
the Prince William Regional Citizens' Advisory Council

Prepared by:
Harvey Consulting, LLC.

December 13, 2006
Revision No.1

March 14, 2007
Revision No.2

Executive Summary

Prince William Sound Regional Citizens Advisory Council (PWSRCAC) requested Harvey Consulting, LLC's, assistance in summarizing the alleged tank integrity issues for Valdez Marine Terminal (VMT) Tank Number 93 (Tank 93).

PWSRCAC received letters from Chuck Hamel in May 2006, requesting the council to investigate tank integrity issues on Tanks 5, 16 and 55, which were inspected and repaired in 2002. Although Tank 93 was not listed in Chuck Hamel's letters, this tank was investigated by PWSRCAC because agency documentation showed Tank 93 was also inspected and repaired in Year 2002, and whistleblowers complaints were received on this tank.

Dr. Kuckertz (P.E., PWSRCAC staff) completed the Tank 93 record review at Alyeska Pipeline Service's (APSC's) offices. In addition to the notes provided by Dr. Kuckertz, P.E., PWSRCAC requested Harvey Consulting to review agency records and meet with concerned individuals to better understand the scope of the allegations, and make a recommendation for further action by PWSRCAC. This report summarizes the work completed by Harvey Consulting, LLC, in the course of completing a preliminary investigation on the alleged Tank 93 integrity concerns.

Tank 93 is a wastewater tank. It was constructed in 1975 and inspected in 1997 and 2002. This tank holds 430,000 bbls of wastewater, containing less than 1% oil. This tank is located in secondary containment. Due to the low oil content and existing secondary containment and liner under the tank, the potential for catastrophic environmental contamination is low.

In May of 2006, PWSRCAC requested APSC to provide records relating to Tank 93 welds. Requests made for meetings with ADEC staff, and former ADEC staff, to discuss the Tank 93 records were denied. However, Ms. Lewis (ADEC) did confirm:

> *There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.*[1]

Employees working at the VMT during the 2002 Tank 93 inspection and repair work allege that materials and repair procedures were substandard. ADEC started investigating the four Tank 93 allegations in October 2002. Tank 93 was returned to service in late 2002, prior to ADEC

[1] August 30, 2006 e-mail from Ms. Lewis (ADEC) to Ms. Harvey (PWSRCAC) copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses.

reaching a finding on whether the allegations were substantiated. ADEC did not reach a finding on the allegations until April of 2003. All four allegations were dismissed by the agency.

Requests made for meetings with APSC staff, and APSC contractors, to discuss the Tank 93 allegations and to review additional records were denied.

Two of the four allegations were not substantiated based on the records available for this review. It is recommended that a welding expert review the allegation made about the use of annular plate braces without base plates and additional information be obtained from APSC to verify the quality material used to replace the tank floor.

Information Available For This Report

Very few sources of written records were available for this report. PWSRCAC requested records from ADEC and JPO. ADEC and JPO provided physical copies of letters via U.S. Mail; however, these records essentially denied any Tank 93 welding concerns from the 2002 timeframe. In May 2006, PWSRCAC requested an opportunity to review APSC Tank 93 records from the 2002 timeframe. In June 2006, PWSRCAC was provided two opportunities to visit APSC's Anchorage office to read and take notes, but not photocopy, information from the Tank 93 files.[2] Dr. Kuckertz (P.E., PWSRCAC staff) completed the APSC record review. In September 2006, APSC provided a copy of their July 3, 2006, report entitled 2002 Valdez Tank Project Review. Attempts to set up additional meetings with APSC Engineering and ADEC to obtain additional information were denied. A written request for additional agency records was prepared by Harvey Consulting, LLC, for PWSRCAC in June 2006, but was not sent by PWSRCAC (Attachment No. 1).

Allegation

Four Tank 93 Allegations

Employees working at the VMT during the 2002 Tank 93 inspection and repair work allege that material used to replace the tank floor was substandard, there was faulty welding, and the tank floor coating was improperly applied.

In late 2002, ADEC started an investigation into the allegations raised during the 2002 VMT Tank Inspection and Repair Program. On April 25, 2003, ADEC issued a findings document summarizing the results of their investigation.[3] This report shows four Tank 93 allegations were reported to ADEC and investigated.

[2] June 14, 2006 and June 20, 2006

[3] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

Dr. Kuckertz, P.E. reviewed the Tank 93 records at the APSC offices on June 14, 2006, and June 20, 2006. Dr. Kuckertz, P.E. examined each of the unsatisfactory inspection findings to ensure that there was documentation showing that the inspection finding was closed out. Dr. Kuckertz, , P.E. concluded that each of the unsatisfactory inspection findings identified by the inspectors was determined to be satisfactory by another inspector prior to returning the tank to crude oil service.

During the interviews conducted by Harvey Consulting, LLC, several people continued to be most concerned about the quality of material used to replace the floor in Tank 93.

Background

According to industry standard API No. 653 tanks are typically internally inspected at least once every decade, unless tank integrity history or risk indicate a different interval. In 2002, Tank 93 was due for an internal tank inspection.

During 2002, Tank 93 was cleaned, inspected, repaired, and returned to service.

Chronology of Events

This section provides a brief chronology of events associated with the inspection and repair work completed on Tank 93 and the subsequent investigation into employee(s) allegations.

May 14, 2002
A letter from APSC notified ADEC that Tank 93 would be inspected, repaired, and raised in 2002.[4]

Summer and Fall 2002
Tank 93 was cleaned, inspected, repaired.

ADEC's letter to PWSRCAC dated June 19, 2006, stated that from June 2002 through September 2002 various APSC employees and contractors provided ADEC with copies of emails relating to Tank 93. Interviews with Mr. Harrison (JPO) in August 2006 confirmed that Tank 93 integrity allegations were reported to JPO and ADEC during the summer and fall of 2002.

October 1, 2002
Mr. Harrison (JPO) and Ms. Friedman (ADEC) met with a concerned employee. The employee was working at the VMT and was concerned about repairs being made to Tank 93. The main concern was the quality of the material used to replace the tank floor.

[4] May 14, 2002 Letter from Rod Hanson (APSC) to Bonnie Friedman (ADEC) and John Kerrigan (JPO) and Jerry Brossia (JPO), Crude Tank Inspections – West Tank Farm, Valdez Marine Terminal

October 16, 2002
ADEC requested information on the inspection and repair of Tank 93. ADEC's letter states that:[5]

> *The Department is aware that these tanks will not be returned to service until such time that certain issues have been resolved.*

October 16, 2002
APSC responds to ADEC, confirming a visual inspection found laminations in 11 bottom plates, varying in size, shape, and depth.[6] The deepest lamination measured 0.030 inches. APSC also reported that the steel used to repair the floor met General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling (ASTM A6), and that the laminations discovered in the steel were within the tolerance of the ASTM standards governing plate manufacture. All bottom plate laminations were, or will be, leak tested. Magnetic particle testing was used to evaluate the deeps lamination and was applied randomly to check the remaining laminations.

December 20, 2002
APSC informs ADEC Tank 93 was internally inspected, repaired, and raised and returned to service.[7]

April 25, 2003
ADEC sent APSC a letter closing out the four Tank 93 allegations.[8] ADEC did not substantiate any of the allegations.

July 2, 2003
APSC submits an annual report for Year 2002 to JPO which included a new cathodic protection system and tank bottom in Tank 93 as one of APSC's accomplishments for 2002.[9] This report also verified Tank 93 was raised on a concrete ring wall and the tank floor was coated.

August 13, 2003

[5] October 16, 2002 letter from Bill Hutmacher (ADEC) to Robert Shoaf (APSC), Request for information on inspection and repairs of Tanks 5, 55, and 93.
[6] October 16, 2002 letter from Mr. Shoaf (APSC) to Mr. Hutmacher (ADEC), Request for information and repairs of Tanks 5, 55, and 93.
[7] December 20, 2002 letter from Mr. Hanson (APSC) to Ms. Friedman (ADEC), Planned internal crude tank inspection cycle.
[8] April 25, 2003 letter from Ms. Friedman (ADEC), to Mr. Shoaf (APSC), Review of Employee Concerns, Inspections of Tanks 5, 55, and 93, Valdez Marine Terminal.
[9] July 2, 2003, letter from Mr. Monthei (APSC) to Mr. Brossia (JPO), 2002 MP-166 Integrity Management Monitoring Program Annual Reports.

ADEC requests the Year 2002 Tank 93 API 653 internal inspection report for department review.[10]

September 30, 2003
APSC provides a two page summary of the Year 2002 Tank 93 API 653 internal inspection report for department review.[11] There are no Tank 93 problems noted.

May 23, 2006
PWSRCAC submitted a public records request to ADEC requiring all the tank inspection and repair records on Tank 93 since 2000.

July 3, 2006
In response to concerns raised by Chuck Hamel, APSC produced a Report in July 2006 entitled, 2002 Valdez Tank Project Review.

Welding Issues: Review of Tank 93 documentation indicated that there were no documented welding issues raised during welding on the floor or door sheet.

APSC concludes there are no Tank 93 Integrity Issues.

Inspection Issues: Review of Tank 93 documentation indicated that there were no documented inspection issues raised during welding on the floor or door sheet.

Work Process Issues: Review of Tank 93 documentation indicated that there were no documented work process issues raised during welding on the floor or door sheet.

Integrity Issues: Review of Tank 93 documentation indicated that there were no documented integrity issues raised during welding on the floor or door sheet. Integrity concerns identified in recent correspondence did not identify any specific issues with Tank 93.

August 2006 (various dates)
Ms. Harvey (Harvey Consulting, LLC) interviewed Mr. Harrison (JPO). Mr. Harrison confirmed employee concerns were reported to JPO and ADEC on Tank 93. The main concern was the quality of the material used to replace Tank 93's floor.

[10] August 13, 2003 letter from Ms. Stergiou (ADEC) to Mr. Shoaf (APSC), Request for Summary Inspection Reports for Valdez Marine Terminal Tanks 80, 81, 93 and 94.
[11] September 30, 2003 Tank 93 summary prepared by Mr. Annett (APSC).

Ms. Harvey interviewed employee(s) that worked on VMT 2002 tank inspection and repair work who alleged the quality of the Tank 93 floor material was the most significant issue. Confidentiality was requested due to fears of retaliation for speaking about what happened on Tank 93 in 2002.

Ms. Harvey made a request to meet Bonnie Friedman (previous ADEC employee), Sam Saengsudham (ADEC) and Becky Lewis (ADEC). Requests for meetings were denied.

August 30, 2006
On August 30, 2006, Ms. Lewis wrote to Ms. Harvey, copying this memo to ADEC Management and the ADEC Environmental Crimes Investigator Mr. Moses:

ADEC declines meeting and records on Tank 93 due to current state investigation

This email is in response to your request this afternoon that Sam Saengsudham and I meet with you on Friday, September 1, 2006 to discuss PWSRCAC's investigation into the Chuck Hamel allegations made in May of 2006 concerning several tanks at the Valdez Marine Terminal (VMT). We have decided not to meet with you at this time. There is an on-going ADEC investigation into this matter, and until we are informed that the investigation has been completed, we will decline further conversations concerning past technical evaluations and/or decisions made by ADEC.

Analysis of Allegations

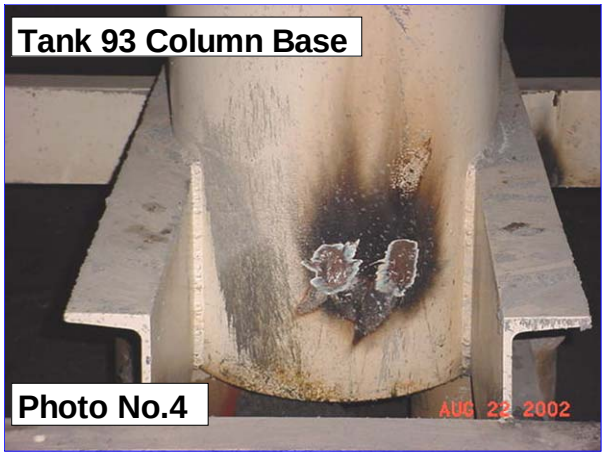
ADEC's April 25, 2003 Findings Document[12] lists four (4) employee concerns raised on Tank 93 during the 2002 Tank Project. Each of the four concerns raised is directly quoted from the ADEC April 25, 2003, finding document in quotations below, with a summary of ADEC's findings, and a brief recommendation for how PWSRCAC might proceed.

ADEC investigated Four (4) Tank 93 concerns

Allegation No. 1 – Temporary Clips Welded to Tank Roof Support Columns

Concern: "Temporary clips were welded to the columns (for tank jacking). No NDE was done on the columns once they were removed."

ADEC Finding: "API 653, Subsection 10.1.4.1 has provision for temporary attachments. But it only applies for attachments to the shell course. The source referred to Section 9.10.2.3 of API



[12] April 25, 2003 letter from Bonnie Friedman (ADEC) to Robert Shoaf (APSC), Review of Employee Concerns, Inspection of Tanks 5, 55, and 93, Valdez Marine Terminal.

653, which is part of 9.10.2- Replacement of Entire Tank."

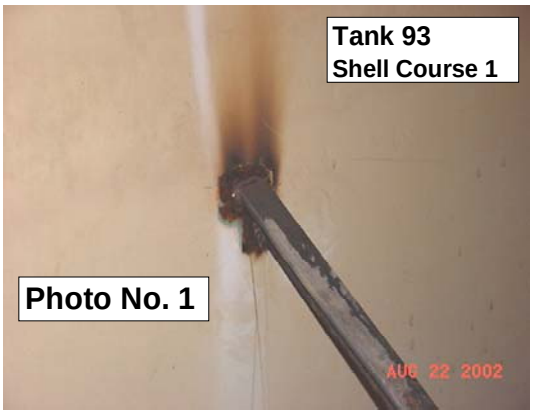
Analysis: The requirements of APSC Project Specification T-411 would have to be reviewed to know what welding requirements were established for repair and testing of welds on the column. API 650 3.8.1.2 states that temporary attachments should be removed and any damage should be repaired and ground to a smooth profile. The photo shown to the right was provided by concerned employee to JPO and ADEC. The photo appears to show a tank column where temporary attachments were removed and the area appears to be ground smooth. There does not appear to be any serious structural damage to this tank column.

No further action recommended

Findings: This concern is not a structural issue for this tank. No further action is recommended.

Allegation No. 2 – Annular Plate Bracing

Concern: "Knee braces and plates at the annular plate."



ADEC Finding: "There is no specific provision in API 650/653 regarding this issue."

Analysis: A November 19, 2002, letter from APSC to JPO lists this concern as Unsatisfactory Inspection Finding No. 7 (UNSAT #7).[13] UNSAT#7 was logged on July 12, 2002, by KAM Inspector Mr. Kale, he wrote:

Angle iron was welded to the Tank 93 shell & annular ring w/o [without] any base plates under them [see] reference T-411 3.3.1(5), T-411-1.5.3(2), API 650 3.8.1.2(C).

Prior to logging this concern on July 12, 2002, Inspector Kale sent an e-mail to Mr. Marchesani (APSC) explaining the concern.[14]

> *I know that there was no details or drawings on the knee braces that were welded to the shell to the annular plate which I believe was to all be after the fact inspection. I think that it says in T-411 that the knee braces even though they are temporary need to have pad plates welded to the annular ring. Can you please clarify this.[?]*

Mr. Marchesani (APSC) responded:[15]

[13] November 19, letter from Rod Hanson (APSC) to Willie Harrison (Joint Pipeline Office), 2002 VMT Tank Program, Inspection Documented Unsatisfactory Conditions

[14] June 28, 2002 E-mail from Mr. Kale (KAM) to Mr. Marchesani (APC), no subject header used. However, this email was about Tank 93 knee brace welding.

Terry [Gross (APSC)] has been through T-411 and could not locate anything pertaining to re-pads of the annular plate-to-shell supports. Some thoughts to consider include:

- *The supports will be in tension rather than compression,*
- *They are used to relieve some of the bending movement on the annular plate-to-shell weld and, as such, the loads transmitted through the brace-to-annular plate welds will be very minor,*
- *Re-pads of these supports were not installed during the tank 94 work, and*
- *It may be better in this case to limit the amount of welding and weld removal we execute on the annular plate.*

PWSRCAC does not have access to the APSC Project Specification T-411; therefore it was not possible to verify the T-411- 3.3.1(5) and T-411-1.5.3(2) requirements cited by Inspector Kale. However, API 650 3.8.1.2(c) states:

Temporary attachments to shell courses shall be removed, and any resulting damage shall be repaired and ground to a smooth profile.

Findings: The requirements of APSC Project Specification T-411 would have to be reviewed to verify the welding requirement established for this tank. API 650 does not specifically address the use of base plates under angle iron; however, this may be common "good welding" practice. It is recommended that the welding expert review these photos and provide PWSRCAC with advice on this concern.

Refer to weld expert

Allegation No. 3 – Floor Material Quality

Concern: "Plate lamination."

Author's Note: A lamination is a metal defect with separation or weakness generally aligned parallel to the worked surface of the metal. A lamination may be the result of pipe blisters, seams, inclusions, or manufacturing defects.

ADEC Finding: "Not an issue. Same comments as TK 5."

Author's note: ADEC restricts their analysis to the specific language of API 653, Section 2.3.6, but does not answer the more important questions: (1) were there defects in the material used to repair the tank floors, and (2) could the use of poor quality material increase the oil spill risk?

Analysis: Laminations in the material used to replace Tank 5 and 93 are described in detail in the Tank 5 Report. That analysis is not repeated in this report.

[15] June 30, 2002 E-mail from Mr. Marchesani (APC) to Mr. Kale (KAM); Knee Braces.

APSC's October 16, 2002, letter to ADEC confirmed the metal used to replace the floor on Tank 93 had some laminations:[16]

> *Visual inspection noted laminations in 11 bottom plates in Tank 93. The indications varied in size, shape, and depth with the deepest measuring 0.030 inches.*

It would be important to review the Tank 93 records to verify the actual number of laminations reported by the inspectors. In the case of Tank 5, APSC reported nine (9) laminations, and the inspectors reported 84. Since there was a large discrepancy on how many actual laminations existed for Tank 5, it may be worth reviewing the number of laminations reported by the inspectors on Tank 93 and compare it to the 11 laminations reported by APSC.

Were Tank 93 floor laminations properly repaired and tested?

The agency's finding does not address the important concern raised about the quality of the metal used to replace the floor in Tank 93. Several people interviewed for this report are still concerned that poor quality metal was used to replace the Tank 93 floor. It is alleged that laminations in the floor plates were found and ground out. Some amount of "patch" welding was completed to repair the more serious laminations. It is alleged that repaired areas of the new floor were not tested to ensure adequate thickness and integrity prior to returning Tank 93 to service; however, APSC disputes this claim. In an October 2002 letter to ADEC, APSC stated bottom plate laminations were, or will be, leak tested. In addition to the leak testing, APSC reported that magnetic particle testing was used to evaluate the deepest laminations and was applied randomly to check the remaining laminations. APSC also stated that report authored by the Project Engineer, the Alyeska Welding Engineer, the Tank Implementation Lead, the API 653 Inspector, the Project Manager, and the Certified Welding Inspector, allegedly ruled out the tank lamination concerns that arose on the 2002 Tank Repair Program.

Author's note: It is not clear why the Tank 93 delamination concern was not listed in the November 19, 2002 letter from APSC to JPO describing all the unsatisfactory inspection findings for the 2002 VMT Tank Program.

Findings: The allegation that defective materials were used to replace Tank 93's floor could not be substantiated based on the records provided for PWSRCAC review. Dr. Kuckertz (P.E., PWSRCAC) reviewed the Tank 93 records and does not remember seeing an engineering report in the project file which allegedly ruled out this concern. Ms. Harvey requested an opportunity to meet with APSC Engineering staff to review the engineering reports and discuss this concern further to bring it to resolution. Ms. Harvey was denied the opportunity to meet with the APSC engineer that worked on this tank floor replacement, and was denied further access to APSC engineering records. Therefore, this issue could not be resolved. It is recommended that the engineering specifications for the tank floor material quality be reviewed and compared to the material delivery and quality

Additional records needed to verify floor material quality

[16] APSC Letter 02-19157

control records. It is also recommended that PWSRCAC obtain and review the engineering report in the project file which allegedly ruled out this concern.

Allegation No. 4 – Floor Quality Testing

Concern: "From the UNSAT list: UNSAT # 23 "coating temperature outside limit". Original project spec's called for 35F application temperature. A subsequent FAR requests the application temperature lowered to 20F."

ADEC Finding: "This is a sample of the UNSAT to show that an UNSAT does not necessarily mean non-compliance with the manufacture specification. The lowest cure temperate is 0 F (Devoe Coatings – BAR-RUST 236 Specification) which is still lower than the proposed temperature in the FAR."

Finding: This allegation could not be substantiated. Inspectors approved the coating and allowed the tank to be returned to service.

No further action recommended

Attachment No.1

[PWSRCAC Letterhead]

June 30, 2006

Kurt Fredricksson
Commissioner
Alaska Department of Environmental Conservation
410 Willoughby Ave., Ste. 303
Post Office Box 111800
Juneau, AK 99811-1800

RE: Clarification of issues related to PWSRCAC public records request of May 24, 2006

Dear Mr. Fredricksson:

On June 19, 2006, the Alaska Department of Environmental Conservation (ADEC) responded to a request for publicly available records for the Valdez Marine Terminal (VMT) Tanks 5, 16, 55, and 93 submitted by Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) on May 24, 2006.

Background
The request for records was made as a follow-up on complaints received by PWSRCAC about the 2002 VMT Tank Inspection and Repair Program. It has been alleged that tank welds may not have been properly repaired or inspected before returning these tanks to hydrocarbon service. This matter was the subject of one or more whistleblower complaints to your office and the Joint Pipeline Office in 2002. This issue has been raised again, through another whistleblower complaint in 2006.

Your June 19, 2006 response to our request for information included both photocopies and digital versions of documents (on CD). Thank you for responding to our request.

Request for Additional Information
PWSRCAC has reviewed the hard copy and digital records provided. The documentation provided by ADEC raises a number of questions and concerns. This letter requests ADEC response to each concern, question, and information request outlined below. We request your response within ten (10) ten days of receipt of this letter, in accordance with the Freedom of Information Act (FOIA).

Most of our comments below are related to a table titled "Documents Withheld from the PWSRCAC Public Records Request concerning inspections and weld information for Valdez Marine Terminal Tanks 5, 16, 55, and 93" included with your July 19, 2006 letter. The table lists 30 documents withheld by ADEC using a "deliberative process" claim.

1. **Document was provided to APSC, but withheld from PWSRCAC.** Your June 19, 2006 letter listed one of the documents withheld as an April 21, 2002 letter from B. Friedman (ADEC) to APSC on the subject of "DRAFT Letter--Review of Employee Concerns for TKS 5, 55, 93." Your letter cites "deliberative process" as the basis for not providing a copy of this document to PWSRCAC.

    a. Was this April 21, 2002 document a summary of employee/whistleblower concerns compiled by B. Friedman on Tanks 5, 55 and 93? If so, why was this agency investigation into a whistleblower complaint shared with APSC in draft form on April 21, 2002?

    b. Why was this document not handled confidentially under the employee concerns program or under the whistleblower protection guidelines?

    c. If this document was provided to APSC on April 21, 2002, how can ADEC justify withholding this document from PWSRCAC as deliberative process? Please explain, or provide a copy of the document.

    d. Is the date on this document correct? The April 21, 2002 date appears inconsistent with all the other document dates which are later in the year. The other whistle blower interview notes are dated June and September 2002. Are there multiple complaints? Or is this a typographic error in the table? Please clarify.

2. **Inadequate documentation of whistleblower concerns.** There are a number of documents listed in the June 19, 2006 table related to whistleblower complaint(s). These documents are undated, evidently un-authored, and have no subject matter listed. While PWSRCAC recognizes the importance of protecting whistleblower identity, it is not clear why you did not identify the date or author, or provide the subject, for some documents. We were particularly concerned that the name of the state or federal investigator that authored each whistleblower report was missing. Dates of agency meetings and names of agency personnel who have authored reports are a matter of public record. The date, author, and subject information should not disclose the whistleblower identity and should thus be provided. Please provide this information or explain why it should be withheld.

    a. The table lists an undated memo from W. Harrison/JPO Employee Concerns Program (ECP) Specialist documenting allegations on Tank 55; however, there is no date provided for this document. Please provide this date.

    b. The table lists a June 29, 2002 e-mail, with a document description that says "S. Saengsudham/ADEC notes on email" where the author's and recipient's names are both withheld on the basis that this would identify a confidential source. We assume this would have been a whistleblower complaint filed with the agency. Please provide the name of the agency representative that is listed as the recipient on the e-mail. Although the author

would be protected under whistleblower protection, the agency personnel handling/receiving the complaints is a matter of public record. Please provide this information.

c. The table lists a June 30, 2002 e-mail where the author and recipient are both withheld due to deliberative process, not to protect a confidential source. Please provide the author and recipient names on this e-mail, as all e-mails contain this information.

d. The table lists an undated e-mail where the author and recipient are both withheld due to deliberative process, and not to protect a confidential source. Please provide the author and recipient names on this e-mail, as all e-mails contain this information.

e. Please verify if there were four separate complaints: (1) April 21, 2002; (2) June 29, 2002; (3) September 20, 2002; and (4) one other undated complaint.

f. Please verify who was assigned the lead role for the ADEC to investigate the whistleblower(s) complaints. Who was assigned the lead investigator role for the JPO?

g. We assume that the state and federal agencies keep detailed, well documented records on all whistleblower complaints. We did not see any formal agency reports issued in your list to document meetings with whistleblowers or other aspects of investigations. Since we assume that the agency would keep very precise records on such important matters, please also provide this the date, name, and subject matter for all reports and investigations produced by the agency on whistleblower allegations for the 2002 VMT Tanks Inspection and Repair Program. This data appears to be missing from your original response.

3. **Documents withheld with inadequate justification.** For 27 of the 30 documents listed as being withheld under deliberative process, we are unable to verify the "deliberative process" claim based on the information provided in the table. Many of the documents being withheld are un-dated, un-authored, and untitled. ADEC has provided insufficient information to describe the role the documents played in the deliberative process. In other cases only vague descriptions of the documents are given such as "handwritten notes" or "e-mail," thus providing insufficient basis for withholding these documents.

    a. Please provide these documents; or alternatively,

    b. Please provide dates, authors, and subject matter to complete this table with a detailed explanation supporting the basis for withholding the document under the deliberative process claim.

4. **Digital records provided appear incomplete or unreliable.** Many of the photographs provided in digital copy do not include a date, tank number, or location to aide us in identifying the tank or

tank component. It is not possible for PWSRCAC to incorporate them in our review of weld-related concerns associated with the tanks in question.

In addition, the digital records provided included tank inspection reports in Excel format. We did not find some of the complete, signed inspection reports in the data you provided. The reports on the CD are incomplete and unapproved. Our staff and consultants reviewed similar records at APSC's offices; however, they were not granted permission by APSC to make copies. We had hoped to obtain them from the agency. We know from reviewing APSC records that complete, signed copies of these reports are available. Please provide the final signed version of these weld inspection records, or explain why the agency did not think it was necessary to obtain final welding reports when investigating these whistleblower allegations.

Finally, the July 16, 2006 list references a zip disk (undated) which cannot be read because of "No Zip Drive at JPO or ADEC," and two other disks are "not readable." It is not clear to PWSRCAC why important whistleblower investigation records would be kept in a computer format that is inaccessible to agency staff. These records are less than 4 years old. The technology should be readily available for reviewing these records. Again there is no data, no author and no recipient listed for these records. Did anyone at the agency ever review this data back in 2002? Was it submitted by a whistleblower? Or was this data developed as part of the agency's investigation?

a. Please provide copies of all photos with labels, including date, tank number, and location on tank.

b. Please indicate who took the photographs provided.

c. How were these photographs used in your investigation and what conclusions did you draw from them? Is there a document that provided an analysis of these photos? We did not find one in the records you sent. Please provide that report.

d. Please provide complete, signed copies of the inspection reports from the CD.

    a. Please provide PWSRCAC with access to the zip disk. We will be happy to arrange access to the necessary technology to access the information contained on it.

5. **Apparent blacking-out of notations.** In some of the documents provided as hard copy, including a memorandum from Alyeska to ADEC on October 14, 2002 and Procedure Quality Review documents, it appears that notes have been blacked out. PWSRCAC requests explanation for this measure, if, in fact, it is possible to confirm that the black markings are covering text on the original document. If it is intended that these markings are referenced in the list of withheld documents, please provide more detailed information to this effect.

6. **Incomplete copy of October 14, 2002 memo.** ADEC files sent in response to our FOIA request include an October 14, 2002 memo (with an October 16, 2002 cover letter) from APSC to ADEC, addressing ADEC questions posed on October 11, 2002. It appears we were provided an incomplete copy of this important memo. Our copy includes the response to ADEC's questions up to "3f--What was the inspection methodology used with respect to laminations?" and no responses to the last three bullet points in the original ADEC letter of October 11, 2002. Please provide the complete copy of this response.

Thank you for very much for your assistance in this matter.

Sincerely,

John S. Devens, PhD
Executive Director

cc: Becky Lewis, ADEC/JPO
Gary Mendivil, ADEC
Donna Schantz
Dr. Kuckertz, P.E.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
INDUSTRY PREPAREDNESS AND PIPELINE PROGRAM
TAPS/VMT Section

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April 25, 2003

File No. 300.50

Robert I. Shoaf, Vice President
Alyeska Pipeline Service Company
P. O. Box 196660
Anchorage, AK 99519

Dear Mr. Shoaf:

SUBJECT: Review of Employee Concerns, Inspections of Tanks 5, 55 and 93, Valdez Marine Terminal.

The Alaska Department of Environmental Conservation (Department), in cooperation with the Joint Pipeline Office (JPO), has completed its review of employee concerns received during September and October 2002 regarding the inspection and repairs of Tanks 5, 55 and 93 at the Valdez Marine Terminal.

We have enclosed a matrix, organized by tank number, of the raised concerns and the Department's findings for each. Please note that several additional issues were identified during the investigation of the original concerns and these are labeled as such. With two exceptions, the result of the Department's review was that the tanks were inspected and repaired consistent with the requirements of API Standard 653, First Edition, 1991 and Supplement 1, January 1992. The concerns that were substantiated had to do with the door sheet welding of Tank 55 and were transmitted to the Department in a letter on April 4, 2002.

Thank you for your assistance during this review, if you have any additional questions or comments, please do not hesitate to contact Mr. Sam Saengsudham at (907) 269-3078 or myself at (907) 257-1375.

Sincerely,

Bonnie Friedman

Bonnie Friedman
Section Manager

Enclosure: Summary of Concerns and Findings.

cc: Mr. John Baldridge, APSC
Mr. William Harrison, JPO
Mr. Jerry Brossia, AO, BLM/JPO
Mr. John Kerrigan, SPC, ADNR/JPO
Mr. Carl Lautenberger, EPA/JPO
Mr. Mike Wrabetz, BLM/JPO
Mr. Bill Hutmacher, IPPP Program Manager
Mr. Sam Saengsudham, ADEC
Mr. Ron Doyle, ADEC

SUMMARY
TANK 5

	Concerns	Findings
1	Roof rafters were only visually inspected although there was evidence of corrosion. Visual Inspection does not satisfy API 653.	API 653 does not specify the inspecting method. However, it calls for inspection and a structural integrity assessment of the roof support system. The "Responsible Inspector" decides how to inspect the rafter.
2	Construction and repair records record not available for the AI to review.	Construction: there is no requirement for tank constructed before state regulations took effect. Repairs: after State regulations took effect, (May 92), all repair records must be kept for the operational life of the tank. If there has been no repair, this item is not applicable.
3	Plate lamination. Many of the plates used for the floor had lamination. No NDE was done to determine the extent of the flaw. No assessment was done. The areas were just "ground out". This does not satisfy API 653 - 2.3.6	API 653 - 2.3.6 is only for shell course lamination. No section of API 653 can be found relating to ***FLOOR*** plates lamination.
4	Just vacuum box testing of bottom plates is not adequate.	This inspection method satisfies API 653 - 10.1.7 for welding. Since the floor was replaced, the latest edition of 650 and 653 should be applied. API 650, 5.3.3, and API 653, 12.1.7.1, allow just visual inspection and vacuum box testing for floor welding.
5	Annular plate was not 100% inspected.	API 653 does not specifically call for an entire plate scan. However, records indicated that a 100% inspection was done.
6	Annular plate was not being NDE after "back-gouging".	API 653 - 10.1.5 has provisions for back-gouged of shell-to-shell welding, not bottom plates
7	API 653 requires UT'ing (internally and externally) of all shell courses quadrants during an internal inspection.	API 653 does not mandate an UT inspection during an internal inspection. Regarding the shell courses, the intent of an internal inspection is to ensure that there is no significant general wall loss and to gather enough information and to perform shell integrity assessments, if needed.
8	Lapping of floor plates ("3 plate rule")	Not an issue. DEC agrees with APSC regarding their interpretation.
9	No nameplate on Tank 5.	New construction standards should only be applied to the new tank bottom, and not shell. Therefore, API 653 does not require a new name plate for an existing tank (shells).
10	"Post weld heat treatment on access door. API 653 requires that anything over 1" should be heat treated – or at the approval of the engineer."	There is no relevant reference regarding post weld heat treatment in API 653. This is dependent upon whether a heat treatment is required under the WPS qualified per ASME Section IX. APSC Records indicate that no post weld

	Concerns	Findings
		heat treatment is required (verifict by an APSC welding engineer).
12	Change of joint design on access door was not appropriately approved by a qualified engineer. (Assume this is UNSAT #17)	There is no explicit requirement in API 653. ASME Section IX, Table QW-253 lists joints groove design change as NONESSENTIAL (eg: changes are OK). The change was reviewed by a licensed PE and an APSC welding engineer.
13	Minimal UTing of roof support columns (**This issue was identified during the investigation of the original concern.**)	Not an issue

TANK 93

	Concerns	Findings
1	Temporary clips were welded to the columns (for tank jacking). No NDE was done on the columns once they were removed.	API 653, Subsection 10.1.4.1 has provision for temporary attachments. But it only applies for attachments to the shell course. The source referred to Section 9.10.2.3 of API 653, which is part of 9.10.2 - Replacement of Entire Tank ***Bottom*** (emphasis added).
2	Knee braces and plates at the annular plate.	There is no specific provision in API 650/653 regarding this issue.
3	Plate lamination.	Not an issue. Same comments as TK 5
4	From the UNSAT list: UNSAT # 23 "coating temperature outside limit". Original project spec's called for 35F application temperature. A subsequent FAR requests the application temperature lowered to 20F.	This is a sample of the UNSAT to show that an UNSAT does not necessary mean non-compliance with the manufacture specification. The lowest cure temperature is 0F (Devoe Coatings - BAR-RUST 236- Specification) which is still lower than the proposed temperature in the FAR.

TANK 55

	Concerns	Findings
1	Welding of the door sheet: the initial WPS was not correct because it was based on a PQR of thickness beyond the range allowed by ASME Code. The WPS was subsequently changed after some vertical welds had been completed.	Portions of this concern have been substantiated. Please see excerpts below form ADEC letter to Mr. Robert Shoaf dated April 4, 2003. There are some inconsistencies between the approved WPS's and the Weld Tracking Report (WTR). Although the WPS's, T-400-2G-1 (Rev 3) and TG-400-3G-1 (Rev 5), have approval dates of 9/20/02 and 9/18/02, respectively, the WTR shows an initial completion and inspection of the welds on 9/17/02. The WTR further contradicts itself by specifying the aforementioned WPS's (as procedures used) which would not have been approved until at least one day later (9/18/02). We are concerned about inspections (and documentation) of welding that have WPS's approved afterward. To elaborate further, records indicate that the welding on the door sheet of TK 55 started on 9/16/02. Pages 1 and 2 of the WTR

	Concerns	Findings
		indicate all initial welding were completed by 9/17/02. However, the WPS's, which were indicated in the 9/17/02 WTR as procedures used for the welds, were not approved by APSC's welding engineer until 9/18/02 and 9/20/02 – up to two days after the welding had started on the door sheet.
2	No heat input monitoring for the door sheet welding.	Portions of this concern have been substantiated. According the WPS TG-400-3G-1 (Rev 5) and its associated Procedure Qualification Report (PQR) T-400-6G-1Q, heat input is considered a supplemental essential variable. Heat input can be calculated from the (welding) Travel Speed, Amperage, and Voltage. However, the WTR does not have any records of the parameters for two vertical welds: FW-4 and FW-8. It is not indicated how the heat input was monitored for the vertical welds for TK 55.
3	Bottom plates lamination.	Not an issue. Same comment as TK 5 and 93.
	The following issues were identified during the investigation of the original concerns.	
4	"Peaking" of shell at the shell to annual weld. Distortion was not in compliance with API 653.	The allegation was based on a draft API 653 report. The description of the distortion (clockwise - counter clockwise) is not considered "peaking" but rather "banding" by API 653. API 653 (1992 Version)- Section 2.3.5.1 specifically refers to peaking and banding at ***welded joints***, not tank shell. API 653 (1992 Version) - Section 8.5.5, allows up to one (1) inch of (banding) distortion. There is an API interpretation regarding Section 8.5.5 specifying that this Section does NOT apply to the "shell to annual welds". Section 8 of API 653 is entitled Dismantling and Reconstruction. Since no tank shell was dismantled or reconstructed, the entire Section 8 might not be applicable, thus not enforceable. The final version of the API 653 report states that this distortion complies with API 653.
5	Elimination of the sump without having a drawing.	Not an issue. Final construction configuration agrees with the final drawings.
6	Spalling of the foundation. This will need an engineering	Not an issue. The final API 653 report states that TK 55 is suitable for

	Concerns	Findings
	analysis before putting the tank back to service.	continued service.

United States Department of the Interior

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TAKE PRIDE IN AMERICA

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4/30/07

S.S.
J.D.
D.S.
T.K.

APR 2 5 2007

Letter No.: 07-002-AM
Case File Serial No.: AA 005847
Section/Stipulation: Grant Stipulation 2.2.1.1
Facility Code: F5060
DD.: N/A

Mr. Stan Stephens
President,
Prince William Sound Regional
Citizen Advisory Committee
PO Box 3089
Valdez, Alaska 99686

Reference: Harvey Consulting LLC, Valdez Marine Terminal Tank Reports: Alleged Integrity Concerns Preliminary Investigations for Tanks 5, 16, 55, and 93

Dear Mr. Stephens,

We would like to thank Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) for sharing the draft reports on VMT Tanks 5, 16, 55, and 93 prepared by Harvey Consulting, LLC. These reports address alleged integrity concerns and provide findings from PWSRCAC's preliminary investigations. We agree with the majority of the reports, but there are several statements that need clarification.

Statement 1:

- Alaska Department of Environmental Conservation (ADEC) and the Joint Pipeline Office (JPO) received complaints about Tanks 5, 16, 55, and 93 during the spring, summer and fall of 2002.

This statement gives the impression that the JPO and ADEC are opposing and separate regulatory agencies. The JPO is a consortium of state and federal agencies that cooperate and coordinate their independent authorities to provide oversight for the Trans-Alaska Pipeline System and other Alaska oil and gas pipelines. It is the purpose of the JPO to conduct its activities in the best interest of the people of the nation and the State of Alaska. The JPO has no regulatory authority of its own but derives its authority from the agencies that make up the consortium.

ADEC received information from a whistleblower, and because the whistleblower requested confidentiality, ADEC requested assistance from the JPO's Employee Concerns Specialist, who is a BLM employee. The BLM agreed to be part of the team and to assist. Mr. Harrison was assigned due to his knowledge of handling confidential ECP complaints and welding.

The BLM did not write a report as we were a member of the team. We therefore presented all of our findings to the ADEC as the team lead. ADEC, with the assistance of the BLM, gathered information and corresponded directly with Alyeska. Its correspondence has been a matter of public record, and was previously provided to PWS RCAC.

Statement 2:

- Mr. Harrison (JPO) recommended a simple, cost effective hardness test be completed on the heat affected zone prior to returning the tank to service. This test was not done.

This is a true statement but leaves the impression that Mr. Harrison's suggestion was ignored. His suggestion was considered, but not chosen, as the way to verify the integrity of the door sheet.

The greatest risk from the alleged lack of heat input information and the after-the-fact welding procedure approval would be a brittle fracture of the tank. A brittle fracture would be a significant integrity concern caused by a sudden catastrophic failure of the tank door sheet welds without substantial resistance to loading or in-service stresses. Due to the fact that the tanks had been stressed to its maximum liquid level (highest stresses) and lowest operating temperature without failing, the BLM saw no additional value from the hardness test and didn't pursue it further. The test was not conducted.

The following is found in API 653 - Tank Inspection, Repair, Alteration, and Reconstruction manual, Section 5 – Brittle Fracture Considerations, Subsection 5.2.1:

> "In all reported incidents of tank failure due to a brittle fracture, a failure occurred during one of the following events: shortly after erection during hydrostatic testing; on the first filling in cold weather; after a change to lower temperature service; or after a repair/alteration."

This experience shows that once a tank has demonstrated the ability to withstand the combined effects of maximum liquid level (highest stresses) and lowest operating temperature without failing, the risk of failure due to a brittle fracture with continued service is minimal.

Statement 3:

- JPO did not issue a report or findings on their investigation of Tank 55. No written records were provided to PWSRCAC showing any JPO involvement in these whistleblower complaints after November 2002. There is no JPO report analyzing compliance with state or federal requirements under the Trans-Alaska Pipeline (TAPS) grant and lease, or other state and federal oil spill prevention and tank construction, maintenance, or repair requirements or compliance orders. No written records were

provided to PWSRCAC to explain why JPO closed its investigation without a report. No compliance or enforcement actions were taken by JPO on this matter.

ADEC, as the team lead and as an integral part of the JPO, developed and released the findings of the investigative team. The BLM as participant of the team accepted the findings of the team and chose not to take further action.

We hope you will direct the report author, Harvey Consulting, LLC, to modify these statements or include these clarifications in the reports as necessary. We look forward to the continued cooperation between the BLM and PWSRCAC on Alyeska Valdez Marine Terminal operations.

Sincerely

Jerry Brossia
Authorized Officer
Bureau of Land Management