


# UTC Incident Investigation Form

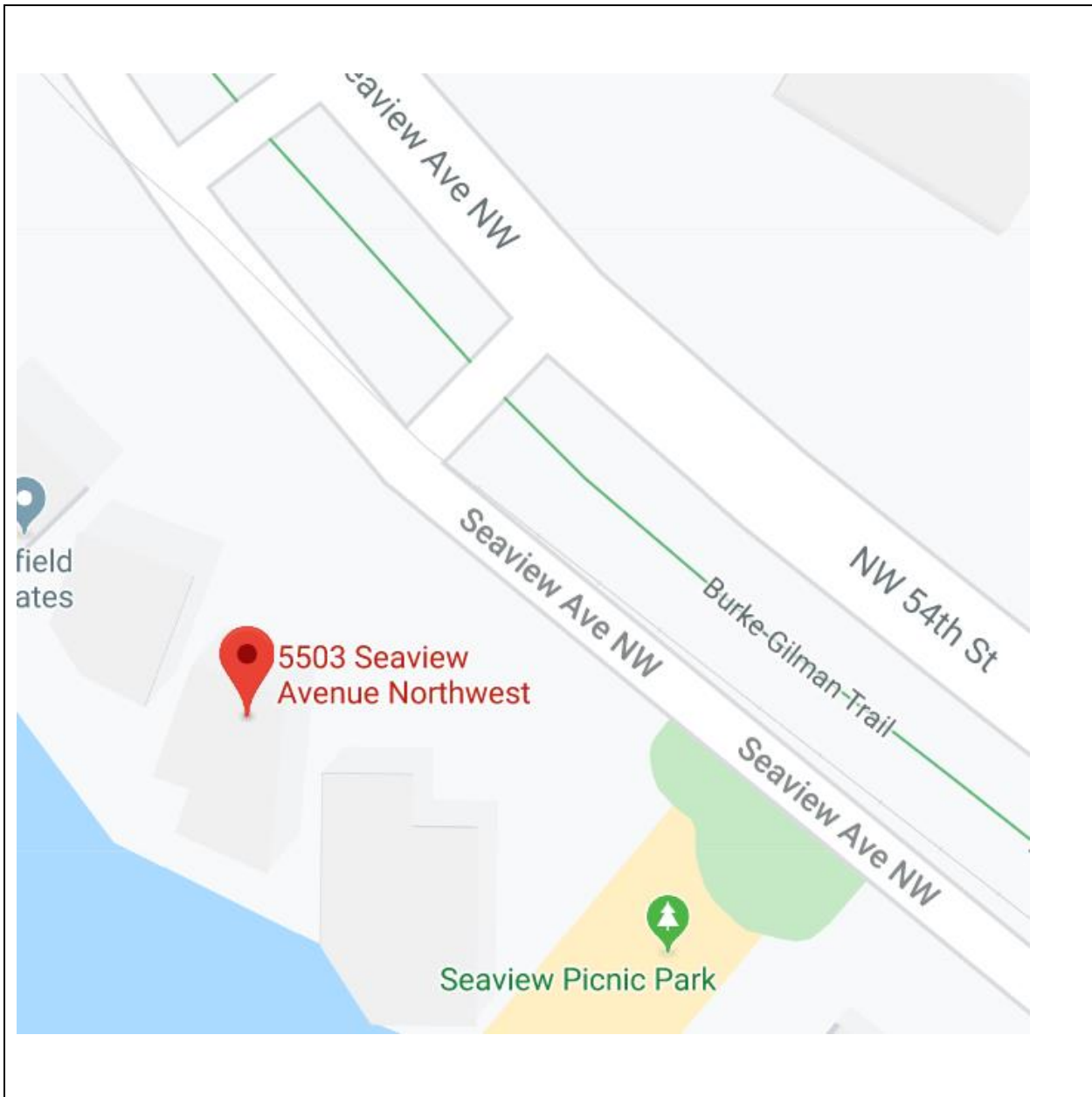
<b>Notification ID:</b>	3465	<b>Investigation ID:</b>	7961
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<b>Inspector Name:</b>	Anthony Dorrough
<b>Date Report Submitted to Chief Engineer:</b>	1/23/2020
<b>Date Report Reviewed &amp; Approved by Chief Engineer:</b>	

<b>Operator:</b>	Puget Sound Energy
<b>District/Unit:</b>	King County West
<b>Locations:</b>	5503 Seaview Ave NW, Ballard
<b>Incident Dates:</b>	February 6, 2019

<b>Description:</b>
<p>Puget Sound Energy (PSE) responded to an unintentional ignition of gas call in Seattle. A contractor crew (InfraSource) was working on the relocation of a 2-inch Steel Wrapped (STW) main to make way for Seattle Public Utilities (SPU) to drill a sewer across Shilshole Bay (see location maps below)</p> 

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Photo 1- 5503 Seaview Ave NW looking north across area of excavation post incident

PSE's Gas First Responders (GFR) controlled the situation by turning off a 2-inch Nordstrom gas valve which resulted in the loss of gas service to five customers. Staff were initially told that this incident was the result of a gas leak. However, after reviewing PSE's 30-day report, staff learned that the STW pipeline had been inserted with Polyethylene (PE). As it was unknown why the contractor crew was welding on pipeline inserted with PE, an investigation was initiated.

## Facts/Chronology of Events:

**1310-First notice to operator of an unintentional ignition 5503 Seaview Ave NW---  
PSE dispatched**

**1352-PSE GFR arrives onsite---Unconfirmed gas leak**

**1510- PSE calls UTC reporting unintentional ignition and unconfirmed gas leak**

**1727-Second notification to UTC---Uncontrolled release of gas for over 2 hours**

**1840-Emergency controlled---five customers without service**

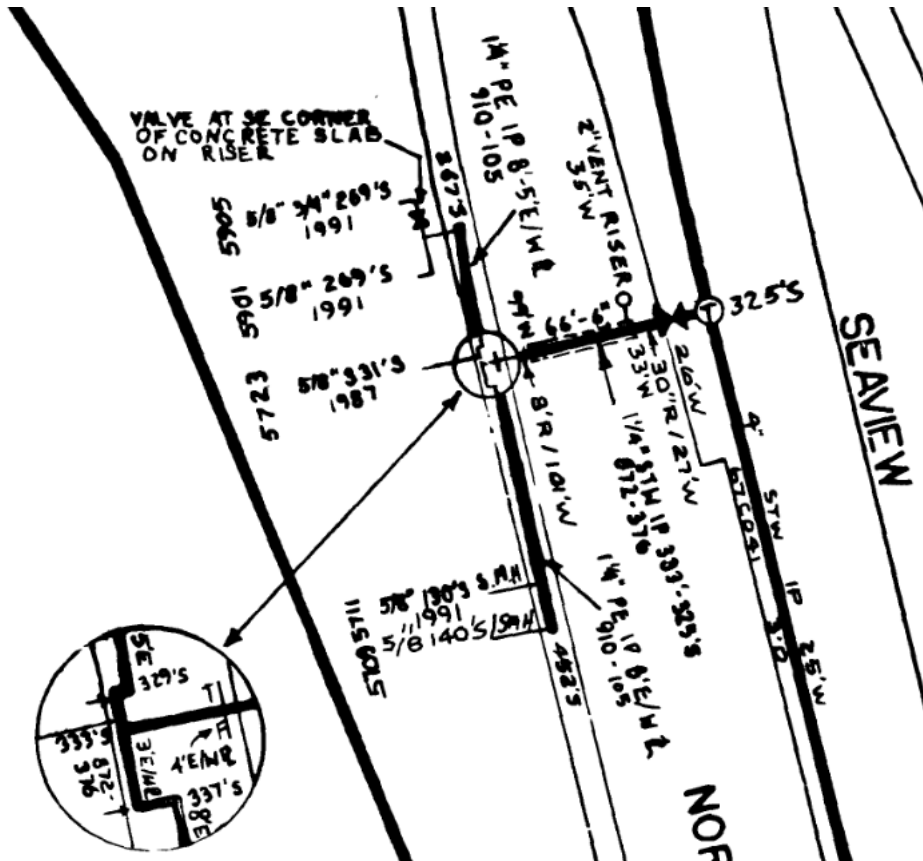
**2010-Final repairs---Customers service restored**

## Investigation Findings:

1. InfraSource crew welding a bottom-out line stopper onto 2-inch STW pipeline, were unaware that the pipeline was inserted with a PE pipeline. (InfraSource interview)

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- The 1-1/8-inch PE pipe inserted into the 2-inch STW was not plated and the existing map indicated only the 2-inch STW pipeline. (see map below)  
(InfraSource interview)



Item#1 -Portion of PSE distribution map of the area involved in the incident

- The main replacement project (Jobs# 323557 & 323558, Order#109000792) that installed the 1-1/8-inch PE pipeline inside of the existing 2-inch STW pipeline was completed in 1998. (see SAP documents below).



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**Display Capital Gas - Dist Improvement 109000792: Central Header**

Order: CGD1 109000792 182.063 5503 SEAVIEW DR NW

182.063 5503 SEAVIEW DR NW

U JOB REQUESTOR: SWILLI  
U JOB DESCRIPTION: REPLACE MAIN IN CASING  
U JOB NAME: DI- 323557 & 323558  
UE JOB ROUTE:

Sys.Status: CLSD PCNF ESTC CSER CMPS PRC SETC SVCC

HeaderData Operations Components Costs Partner Objects Additional Data Location Planning Control Enhancement

Service

Sales Document: 0

SuperOrder: G9807881 182.063 5503 SEAVIEW DR NW

Person responsible

PlannerGrp: GDB / 1000 GS Cathodic Protec  
Mn.wk.ctr: PCPGT006 / 1000 CATHODIC PROTECT..

Notifctn:   
Costs: 1,829.82 USD  
PMActType: MR1 DO NOT USE Old ...  
SystCond: ☐

Dates

Bsc start: 10/09/1998 Priority:   
Basic fin.: 10/15/1998 Revision:   
Reference object

Func. Loc.: MUN-KNG-SEAT OPS KNG CTY SEATTLE  
Equipment:   
Assembly:   
First operation

Operation: CONTRACTOR OUTLINE AGREEMENT Cckey Calculate work

Item#2 SAP documentation of main replacement Jobs# 323557 & 323558

**Work Order Detail report**

Toggle

PSE Production Client Work Order Detail report Time 07:25:04 Date 03/28/2019  
Bellevue (Cumulative periods) ZTBO /IMAXWE Page 1

Order: 109000792 182.063 5503 SEAVIEW DR NW  
Status: CLSD PCNF ESTC CSER CMPS PRC SETC SVCC

	Estimated	Planned	Actual
Total Cost:	1,829.82	0.00	8,258.04
Contributions/Billings:	0.00	0.00	0.00

Cost Element	Description/Estimate	Planned	Actual	Variance	Planned Qty	Actual Qty	Variance Qty
63400000	BLOCKED - AFUDC	0.00	90.82			0.000	
CEG_AFUDC.PP	AFUDC prior PP eff. 1	0.00	90.82				
60333000	Emp Exp - Mileage Rei	0.00	6.62		0.000	0.000	
CEG_EMPEXP	Employee Expense	0.00	6.62			0.000	
MATERIAL	DESCRIPTION						
5000307	CP BOX TEST STATION C	0.00	74.90		0 EA	2 EA	2 EA
66000025	CP ANODE 9LBS	0.00	84.10		0 EA	2 EA	2 EA
60611000	PIPE 1-1/8" COIL MED	0.00	9.20		0 FT	55 FT	55 FT
7200325	REDUCER 1-1/4" X 1" WEL	0.00	5.28		0 EA	1 EA	1 EA
7200405	REDUCER 2" X 1-1/4" W	0.00	4.33		0 EA	1 EA	1 EA
8500920	CP CABLE #4 COPPER	0.00	26.01		0 FT	54 FT	54 FT
60611000	Materials & Supplies	0.00	203.82			115.000	
5800285	TRANSITION 1-1/8" PE	0.00	22.28		0 EA	2 EA	2 EA
60625000	Materials & Supplies	0.00	22.28			2.000	
CEG_MATERI	Material	0.00	226.10				
84100002	Construction Overhead	0.00	594.16-		0.000	0.000	
CEG_OHCNST	OH Construction	0.00	594.16-			0.000	
84100000	Stores Overhead on Or	0.00	26.50		0.000	0.000	
CEG_OHMATL	OH Material	0.00	26.50			0.000	
PO NUMBER	PO DESCRIPTION						
		0.00	762.85		0.000	0.000	
		0.00	0.00		0.000	0.000	

Item#3 SAP documentation of work order#109000792

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4. On October 12, 2000, Staff investigated an incident involving a leaking polyethylene (PE) pipeline located at 8911 12th Avenue N.E. Seattle. Staff found that on October 4, 2000, a contractor working for PSE, was installing a 5/8-inch PE natural gas service line to the above address and had welded a 1/2-inch steel punch-it service tee to a 2-inch bare steel casing that had been previously inserted with a 1-1/4-inch PE gas main. The heat from welding the punch-it tee caused the inserted 1-1/4-inch PE main to melt through and leak. The leaking gas migrated inside the steel casing and spread throughout the block, entering the sewer lines. (see interview with Scott Rukke-UTC)

### **Phone interview with InfraSource Foreman & Crew**

The foreman indicated that they had reviewed project documentation, including operation and distribution mapping from PSE beforehand and were completely unaware that PE piping was inserted into the gas main they were about to begin welding on. (Lee Maxwell-PSE was present with InfraSource personnel during phone interview with staff)

### **Phone interview with Scott Rukke-(UTC staff)**

Mr. Rukke stated that he investigated an incident involving a gas main that leaked after being welded on by a contractor crew that was unaware of PE being inserted into the pipeline.

### **Causes/Contributing Factors:**

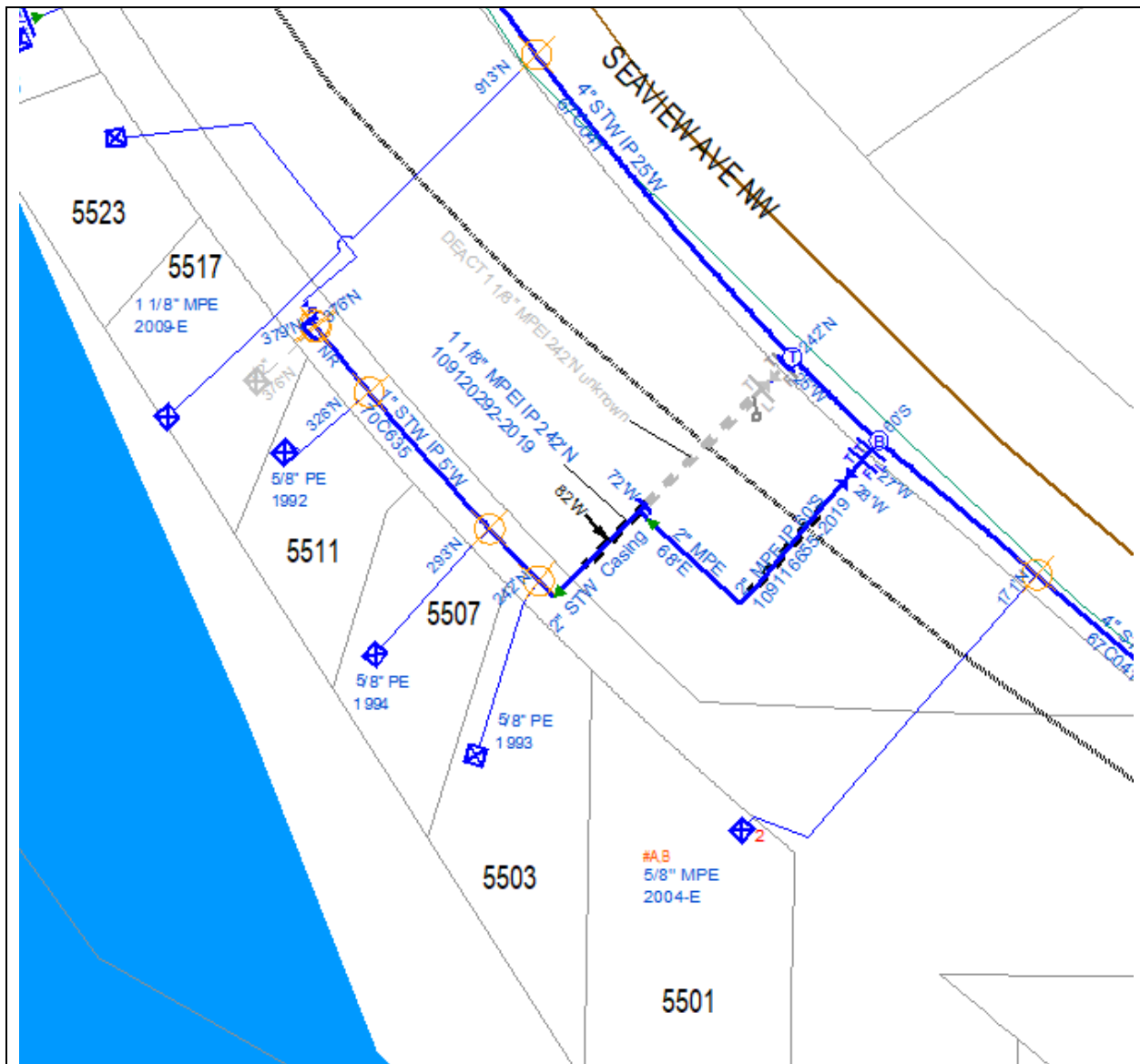
Based on the evidence/facts discovered during the investigation, it appears the lack of awareness that there was a PE pipeline inserted into the STW pipeline the InfraSource crew was welding on, caused natural gas to escape from the pipeline which then ignited. The investigation did not conclude whether or not the steel casing surrounding the 2-inch STW main was sealed. The subsequent fire did not cause any injuries or significant property damage, but did have the potential for catastrophic injury and even death. The investigation found evidence supporting the conclusion that if the operation and distribution maps provided had been adequately updated the incident would not have happened.

### **Regulatory Analysis/ Violations:**

Based upon the evidence collected in this investigation, operation and distribution maps were not updated. There is nothing currently in code that requires the operator to have updated maps. Additionally, there were no findings related to PSE's emergency response that were concerns or violations of state/federal safety rules or regulations, and after reviewing operation and maintenance documents there were no evident violations. Also, operator qualification reviews revealed no violations.

Staff requested PSE update the specific operations and distribution maps involved in the incident and reviewed the results of a comprehensive root cause analysis investigation implemented by PSE following the incident on December 11, 2019. (see map below)

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Item#4 Portion of the updated PSE distribution map of the area involved in the incident

Lee Maxwell-PSE indicated to staff that the highest risk inserted PE poses to their system is with mapping accuracy. PSE's DIMP team started a mapping accuracy program in 2018 with PE services being one of the areas of focus. The "Summary of Asset Mitigation by Additional and Accelerated Action" table located on pg. 4 of PSE's DIMP Accelerated Action Report captures the current focus areas in the Mapping Accuracy Program. This report is provided to the UTC annually in June. PSE has stated that as the program matures, new focus areas will be identified and added. The addition of PE mains is being considered and it will most likely become part of this Mapping Accuracy Program.

### Follow up/ Recommendations:

PSE's DIMP Accelerated Action Report should include the addition of PE inserted mains, as a focus area within their Mapping Accuracy Program. Staff would like to know how PSE plans to insure that a similar incident does not occur in the future.

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