



## แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบผลิตไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 27 เดือน มีนาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
25		4.00		17.00	
26		4.00		17.00	
27		4.00		17.00	
28		4.00		17.00	
29		4.00		17.00	
30		4.00		17.00	
31		4.00		17.00	
32		4.00		17.00	
33		4.00		17.00	
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## แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 20 เดือน กุมภาพันธ์ พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		04.00		17.60	
2		06.00		17.00	
3		09.00		17.00	
4		04.00		17.00	
5		06.00		17.00	
6		04.00		17.00	
7		04.00		17.00	
8		04.00		17.00	
9		06.00		17.00	
10		04.00		17.00	
11		04.00		17.00	
12		04.00		17.00	
13		04.00		17.00	
14		04.00		17.00	
15		04.00		17.00	
16		04.00		17.00	
17		04.00		17.00	
18		06.00		17.00	
19		04.00		17.00	
20		04.00		17.00	
21		04.00		17.00	
22		01.00		17.00	
23		04.00		17.00	
24		04.00		17.00	



# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 20 เดือน กรกฎาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
25		09.00		17.00	
26		09.00		17.00	
27		09.00		17.00	
28		09.00		17.00	
29		09.00		17.00	
30		09.00		17.00	
31		09.00		17.00	
32		09.00		17.00	
33		09.00		17.00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 27 เดือน กุมภาพันธ์ พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08.00		17.00	
2		08.00		17.00	
3		08.00		17.00	
4		08.00		17.00	
5		08.00		17.00	
6		08.00		17.00	
7		08.00		17.00	
8		08.00		17.00	
9		08.00		17.00	
10		08.00		17.00	
11		08.00		17.00	
12		08.00		17.00	
13		08.00		17.00	
14		08.00		17.00	
15		08.00		17.00	
16		08.00		17.00	
17		08.00		17.00	
18		08.00		17.00	
19		08.00		17.00	
20		08.00		17.00	
21		08.00		17.00	
22		08.06		17.06	
23		08.00		17.00	
24		08.00		17.00	





# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคครั้งที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 27 เดือน กุมภาพันธ์ พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
25		06.00		17.00	
26		06.00		17.00	
27		06.00		17.00	
28		06.00		17.00	
29		06.00		17.00	
30		06.00		17.00	
31		06.00		17.00	
32		06.00		17.00	
33		06.00		17.00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 8 เดือน สิงหาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:06	
5		08:00		17:00	
6		08:00		17:00	
7		08:00		17:00	
8		08:00		17:00	
9		08:00		17:00	
10		08:00		17:00	
11		08:00		17:06	
12		06:00		17:00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 13 เดือน มีนาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		๐๘:๐๐		17:๐๐	
2		๐๘:๐๐		17:๐๐	
3		๐๘:๐๐		17:๐๐	
4		๐๘:๐๐		17:๐๐	
5		๐๘:๐๐		17:๐๐	
6		๐๘:๐๐		17:๐๐	
7		๐๘:๐๐		17:๐๐	
8		๐๘:๐๐		17:๐๐	
9		๐๘:๐๐		17:๐๐	
10		๐๘:๐๐		17:๐๐	
11		๐๘:๐๐		17:๐๐	
12		๐๘:๐๐		17:๐๐	
13		๐๘:๐๐		17:๐๐	
14		๐๘:๐๐		17:๐๐	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 18 เดือน มีนาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:00	
5		08:00		17:00	
6		08:00		17:00	
7		08:00		17:00	
8		08:00		17:00	
9		08:00		17:00	
10		08:00		17:00	
11		08:00		17:00	
12		08:00		17:00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 28 เดือน มีนาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:00	
5		08:00		17:00	
6		08:00		17:00	
7		08:00		17:00	
8		08:00		17:00	
9		08:00		17:00	
10		08:00		17:00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 4 เดือน เมษายน พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:00	
5		08:00		17:00	
6		08:00		17:00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 12 เดือน มีนาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:06		17:06	
2		08:06		17:00	
3		08:00		17:00	
4		08:00		17:06	
5		08:00		17:06	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 17 เดือน พฤษภาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:00	
5		08:00		17:00	
6		08:00		17:00	
7		08:00		17:00	
8		08:00		17:00	
9		08:00		17:00	
10		08:00		17:00	
11		08:00		17:00	
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# แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 18 เดือน พฤษภาคม พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		08:00		17:00	
2		08:00		17:00	
3		08:00		17:00	
4		08:00		17:00	
5		08:00		17:00	
6		08:00		17:00	
7		08:00		17:00	
8		08:00		17:00	
9		08:00		17:00	
10		08:00		17:00	
11		08:00		17:00	
12		08:00		17:00	
13		08:00		17:00	
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## แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการถ่ายทอดก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการก่อสร้างฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการก่อสร้างฯ นวนคร-รังสิต)

วันที่ 14 เดือน มิถุนายน พ.ศ. 2566

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		9.00		17.00	
2		9.00		17.00	
3		9.00		17.00	
4		9.00		17.00	
5		9.00		17.00	
6		9.00		17.00	
7		9.00		17.00	
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## แบบบันทึกเข้า-ออกงาน (Time Sheet)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วง กรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ 15 เดือน มิถุนายน พ.ศ. 2565

ลำดับ	ชื่อ-สกุล	เวลาเข้า	ลงชื่อ	เวลาออก	ลงชื่อ
1		9.00		17.00	
2		9.00		17.00	
3		9.00		17.00	
4		9.00		17.00	
5		9.00		17.00	
6		9.00		17.00	
7		9.00		17.00	
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บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม (ระยะก่อสร้าง)

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท)

(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

ภาคผนวก 2-5 (ค)

ประกาศนียบัตรเจ้าหน้าที่ความปลอดภัยในการทำงาน

กรกฎาคม 2566



3/4 ถนนประดิษฐมนูกิจ แขวงคลองกุ่ม เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



[www.enticcompany.com](http://www.enticcompany.com)



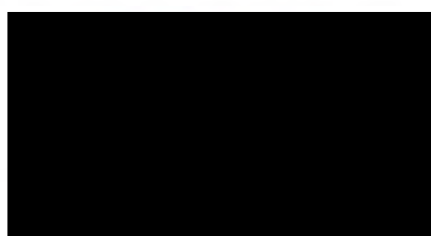
ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด





## ใบตอบรับเอกสาร

สำนักงานสวัสดิการและคุ้มครองแรงงานจังหวัดปทุมธานี  
ได้รับเอกสารเรียบร้อยแล้ว



นักวิชาการแรงงาน

ลงวันที่ ๙ มิถุนายน ๒๕๖๕

หมายเหตุ

๑. บริษัท สยามราช จำกัด (มหาชน)

๒. มายื่นเอกสารดังนี้

- หนังสือแจ้งขึ้นทะเบียนเจ้าหน้าที่ความปลอดภัยในการทำงาน

## หนังสือคำสั่ง

1 มิถุนายน 2565

เรื่อง นำส่งหนังสือแจ้งขึ้นทะเบียนเจ้าหน้าที่ความปลอดภัยในการทำงาน

เรียน สำนักงานสวัสดิการและคุ้มครองแรงงาน จังหวัดปทุมธานี

- สิ่งที่ส่งมาด้วย 1. หนังสือแจ้งขึ้นทะเบียนของเจ้าหน้าที่ความปลอดภัยในการทำงาน [REDACTED]
2. สำเนาการแต่งตั้งเจ้าหน้าที่ความปลอดภัย ประกาศที่ 16/2565
3. หลักฐานประกอบการขอยื่นขึ้นทะเบียนประกอบด้วย
- 3.1 สำเนาบัตรประจำตัวประชาชน จำนวน 2 ฉบับ
- 3.2 สำเนาใบรับรองผ่านการฝึกอบรมหลักสูตรเจ้าหน้าที่ความปลอดภัยในการทำงาน  
จำนวน 2 ฉบับ

ตามที่กฎกระทรวงกำหนดมาตรฐานในการบริหารจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. 2549 ลงวันที่ 16 พฤษภาคม 2549 บริษัท สยามราช จำกัด (มหาชน) ประกอบกิจการ นำเข้าอุปกรณ์ทางด้านวิศวกรรมและการบริการ ตั้งอยู่เลขที่ 289/9 หมู่ 10 ถนนรางสายเก่า ตำบลสำโรง อำเภอลำลูกกา จังหวัดปทุมธานี 10130 โทรศัพท์ 02-743-5010 ได้ดำเนินการตามข้อกำหนด จึงได้นำส่งเอกสาร ดังแสดงในเอกสารแนบท้าย

จึงเรียนมาเพื่อทราบ



ขอแสดงความนับถือ


ลงชื่อ..

General Manager

วันที่ 1 มิถุนายน 2565

### การแจ้งข้อเพื่อขึ้นทะเบียน ของเจ้าหน้าที่ความปลอดภัยในการทำงาน

ประจำโครงการย้ายท่าอากาศยาน เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทย  
และรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาค ช่วงที่ 1  
กรุงเทพ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพ-นครราชสีมา) สัญญา 4-2  
(โครงการก่อสร้างท่าอากาศยานศูนย์ราชการแจ้งวัฒนะและศูนย์หลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการก่อสร้างท่าอากาศยานนคร-รังสิต)

ข้าพเจ้า  ตำแหน่ง General Manager ชื่อสถานประกอบการ  
บริษัท สยามราช จำกัด (มหาชน) ประเภทกิจการ นำเข้าอุปกรณ์ทางด้านวิศวกรรมและการบริการ  
ที่ตั้ง 289/9 หมู่ 10 ถนนรรางสายเก่า ตำบลสำโรง อำเภอบางพลี จังหวัดสมุทรปราการ 10130  
โทรศัพท์ 0-2743-5010 ขอแจ้งข้อเจ้าหน้าที่ความปลอดภัยในการทำงานเพื่อขึ้นทะเบียน ดังนี้

1. เจ้าหน้าที่ความปลอดภัยในการทำงานระดับบริหาร จำนวน 1 ท่าน คือ

1.1 นายวิทยา ตระกูลการงาน

2. เจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิค จำนวน 1 ท่าน คือ

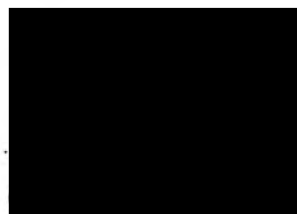
2.1 นายพลระวี วงศา

พร้อมนี้ได้แนบเอกสาร ดังนี้

1. สำเนาการแต่งตั้งเจ้าหน้าที่ความปลอดภัย ประกาศที่ 16/2565 จำนวน 1 ฉบับ
2. สำเนาบัตรประจำตัวประชาชน จำนวน 2 ฉบับ
3. สำเนาใบรับรองผ่านการฝึกอบรมหลักสูตรเจ้าหน้าที่ความปลอดภัยในการทำงาน  
จำนวน 2 ฉบับ



ลงชื่อ...



General Manager



ประกาศที่ 16/2565

เรื่อง แต่งตั้งเจ้าหน้าที่ความปลอดภัยในการทำงาน

ประจำโครงการย้ายท่าอากาศยาน เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทย และรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาค ช่วงที่ 1 กรุงเทพฯ-หนองคาย ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา (สัญญา 4-2)  
(โครงการก่อสร้างท่าอากาศยานศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการก่อสร้างท่าอากาศยาน นคร-รังสิต)

เพื่อให้เป็นไปตามกฎกระทรวง กำหนดมาตรฐาน ในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ.2549 ทางบริษัท สยามราช จำกัด (มหาชน) จึงขอแต่งตั้ง ลูกจ้างซึ่งมีคุณสมบัติตามกฎหมายฯ ดังนี้

1. เจ้าหน้าที่ความปลอดภัยในการทำงานระดับบริหาร

1.1

ตำแหน่ง Construction Manager

โดยเจ้าหน้าที่ความปลอดภัยในการทำงานระดับบริหารมีหน้าที่ ดังต่อไปนี้

1. กำกับ ดูแล เจ้าหน้าที่ความปลอดภัยในการทำงานทุกระดับซึ่งอยู่ในบังคับบัญชาของเจ้าหน้าที่ความปลอดภัยในการทำงานระดับบริหาร
2. เสนอแผนงานโครงการด้านความปลอดภัยในการทำงานในหน่วยงานที่รับผิดชอบต่อนายจ้าง
3. ส่งเสริม สนับสนุน และติดตามการดำเนินงานเกี่ยวกับความปลอดภัยในการทำงานให้เป็นไปตามแผนงานโครงการเพื่อให้มีการจัดการด้านความปลอดภัยในการทำงานที่เหมาะสมกับสถานประกอบการ
4. กำกับ ดูแล และติดตามให้มีการแก้ไขข้อบกพร่องเพื่อความปลอดภัยของลูกจ้างตามที่ได้รับรายงานหรือตามข้อเสนอแนะเจ้าหน้าที่ความปลอดภัยในการทำงานคณะกรรมการ หรือหน่วยงานความปลอดภัย

2. เจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิค

2.1

ตำแหน่ง Environmental Engineer

โดยเจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิคมีหน้าที่ ดังต่อไปนี้

1. ตรวจสอบและเสนอแนะให้นายจ้างปฏิบัติตามกฎหมายเกี่ยวกับความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน
2. วิเคราะห์งานเพื่อชี้บ่งอันตราย รวมทั้งกำหนดมาตรการป้องกันและขั้นตอนการทำงานอย่างปลอดภัย เสนอนายจ้าง
3. แนะนำให้ลูกจ้างปฏิบัติตามข้อบังคับและคู่มือตามข้อ ๓

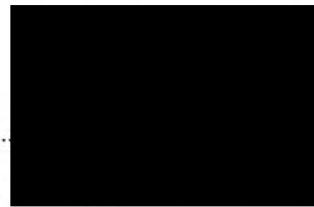
4. ตรวจสอบหาสาเหตุการประสบอันตราย การเจ็บป่วย หรือการเกิดเหตุเดือดร้อนรำคาญอันเนื่องมาจากการทำงาน และรายงานผล รวมทั้งเสนอแนะต่อนายจ้างเพื่อป้องกันการเกิดเหตุโดยไม่ชักช้า
5. รวบรวมสถิติ จัดทำรายงาน และข้อเสนอแนะเกี่ยวกับการประสบอันตราย การเจ็บป่วย หรือการเกิดเหตุเดือดร้อนรำคาญอันเนื่องมาจากการทำงานของลูกจ้าง
6. ปฏิบัติงานด้านความปลอดภัยในการทำงานอื่นตามที่นายจ้างมอบหมาย

ทั้งนี้ตั้งแต่บัดนี้เป็นต้นไป

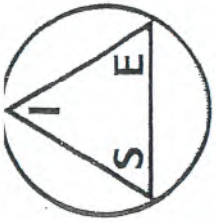
จึงขอประกาศมาให้ทราบและปฏิบัติหน้าที่ นับตั้งแต่วันที่ 31 พฤษภาคม 2565 เป็นต้นไป



ประกาศ ณ วันที่ 31 พฤษภาคม 2565



General Manager



SAFETY INNOVATION AND ENGINEERING LIMITED PARTNERSHIP

## หจก.นวัตกรรมความปลอดภัยและวิศวกรรม

ได้รับการขึ้นทะเบียนจากกรมสวัสดิการและคุ้มครองแรงงาน เลขทะเบียนที่ จป.๖๓-๐๒๒

มอบวุฒิบัตรนี้ไว้เพื่อแสดงว่า



ผ่านการฝึกอบรมหลักสูตร เจ้าหน้าที่ความปลอดภัยในการทำงาน ระดับบริหาร  
ตามกฎหมายกำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัย อาชีวอนามัย



และสภาพแวดล้อมในการทำงาน พ.ศ.๒๕๕๙

ระหว่างวันที่ ๒๘-๒๙ เมษายน พ.ศ.๒๕๖๕ จำนวน ๑๒ ชั่วโมง

ให้ไว้ ณ วันที่ ๓๐ เมษายน พ.ศ.๒๕๖๕

ว่าที่ร้อยโท



กรรมการผู้จัดการ







สถาบันฝึกอบรมด้านความปลอดภัยในการทำงาน  
บริษัท ท็อป โปรเฟสชั่นแนล แอนด์ ดีเวลอปเม้นต์ จำกัด  
ได้รับการขึ้นทะเบียนจากกรมสวัสดิการและคุ้มครองแรงงาน เลขทะเบียนที่ ๖๓ - ๐๑๑  
มอบวุฒิบัตรนี้ไว้เพื่อแสดงว่า

ผ่านการอบรมหลักสูตรเจ้าหน้าที่ความปลอดภัยในการทำงานระดับเทคนิค  
ตามกฎหมายกำหนดมาตรฐานในการบริหารและการจัดการด้านความปลอดภัยอาชีวอนามัย  
และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๕  
ระหว่างวันที่ ๒๕ - ๓๑ กรกฎาคม ๒๕๖๔  
ให้ไว้ ณ วันที่ ๓๑ กรกฎาคม ๒๕๖๔

กรรมการผู้จัดการ





บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม (ระยะก่อสร้าง)

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท)

(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

## ภาคผนวก 2-6

ตัวอย่างกิจกรรมการอบรมเพื่อส่งเสริมด้านอาชีวอนามัย  
และความปลอดภัยในการทำงาน (Tool Box Talk)

กรกฎาคม 2566



3/4 ถนนประดิษฐ์มนูกิจ แขวงคลองกุ่ม เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



[www.enticcompany.com](http://www.enticcompany.com)



ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน



## (Safety/Tool Box Talk)

โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

11 Jan 2023

เวลา (Time)

สถานที่ (Location)

YJ site office

จำนวนผู้เข้าอบรม (No. of participant)

31

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ห้ามก่อ ความเดือดร้อน รำคาญ เพื่อ ความ ปลอดภัย ของชุมชน ที่อยู่ ใกล้ เคียง
2. ห้ามเก็บรวบรวมสิ่งวัสดุอุปกรณ์ในสื่อโมเรอ์ด้น ช่วงเวลา 06.30 - 09.30 น. และ 16.00 - 19.30 น. บนถนนที่มีจราจรหนาแน่น หรือทางแยกต่าง ๆ
3. ห้ามทิ้งขยะ หรือเศษวัสดุสิ่งของไว้ในถนนส่วนน้ำ สรรพ ชาติโดยเด็ดขาด

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		QC		
22		Fitter A		





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา)

สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

11 Jan 2023

เวลา (Time)

สถานที่ (Location)

YJ site office

จำนวนผู้เข้าอบรม (No. of participants)

31

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ทบทวน ความปลอดภัยก่อนปฏิบัติงาน เพื่อความปลอดภัยของชุมชนที่ปฏิบัติงาน
2. ทดสอบความพร้อมของอุปกรณ์ในรั้วโรงงานในรั้วโรงงาน ช่วงเวลา 06.30-09.30 น. และ 16.00-19.30 น. มณฑลที่มีโครงการตามแผนฯ นี้ ซึ่งขอทดสอบแล้ว
3. ทบทวน ทดสอบความพร้อมของอุปกรณ์ในแนวส่งกำลัง ความปลอดภัยโดยเด็ดขาด

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
23		Fitter A		
24		Fitter B		
25		Fitter B		
26		Fitter B		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Welder		
33		Worker		
34				
35				
36				
37				
38				
39				
40				



การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน  
ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการ  
ท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

12 Jan 2023

เวลา (Time)

สถานที่ (Location)

YJ Site Office

จำนวนผู้เข้าอบรม (No. of participant)

24

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ห้ามปล่อยอุปกรณ์ เครื่องมือ และเครื่องจักรและ/หรือ วัตถุตกจากที่สูง ห้ามปล่อยของหนักหรือของมีคมลงจากที่สูง ห้ามปล่อยของหนักหรือของมีคมลงจากที่สูง
2. ห้ามเสียบสายการเชื่อมต่อสายไฟในช่องเสียบสายไฟ
3. ผู้ปฏิบัติงานในบริเวณที่มีเสียงดังเกิน 95 เดซิเบล (เอ) ในห้วงเวลาใดก็ได้ไม่เกิน 4 ชั่วโมงต่อวัน และต้องสวมใส่อุปกรณ์ป้องกันเสียง (Ear Plugs) หรือที่อุดหู (Ear Muffs) ที่มิดชิดและต้องไม่ถอดออกจนกว่าจะพ้นจากบริเวณที่มีเสียงดังเกิน 95 เดซิเบล (เอ)

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		QC		
22		Fitter A		





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน



## (Safety/Tool Box Talk)

โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา)

สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-อยุธยา) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

12 Jan 2023

เวลา (Time)

สถานที่ (Location)

17 site office

จำนวนผู้เข้าอบรม (No. of participants)

24

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ห้ามดื่มสุราขณะทำงาน และเครื่อจักรกล/บริเวณขุดเจาะ ห้ามไปนอน ห้ามดื่มเครื่องดื่มแอลกอฮอล์ และสิ่งมึนเมาอื่น ๆ
2. ห้ามเล่นโทรศัพท์มือถือขณะทำงาน
3. ผู้ปฏิบัติงานในบริเวณที่มีเสียงดังเกิน 85 เดซิเบล (dB) ให้สวมใส่หูฟังป้องกันเสียง และใส่หน้ากากป้องกันฝุ่น (Ear Plugs) หรือที่ครอบหู (Ear Muffs) ที่มีมาตรฐาน และมีคุณสมบัติไม่ก่อให้เกิดการบาดเจ็บหรือโรคภัยต่าง ๆ

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
23		Fitter A		
24		Fitter B		
25		Fitter B		
26		Fitter B		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Welder		
33		Worker		
34				
35				
36				
37				
38				
39				
40				





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการ ท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-ไทย) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

13 Jan 2023

เวลา (Time)

สถานที่ (Location)

NS Site office

จำนวนผู้เข้าอบรม (No. of participant)

29

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. การเดินเครื่องจักรกลหนักที่มีเสียงดัง ต้องเร่งดำเนินการ ให้แล้วเสร็จโดยเร็ว และจัดเครื่องจักร หมาย: ช่างทำงาน ฝาผนัง และชุด เครื่องจักรที่มีเสียงดัง
2. จัดเครื่องจักรกลหนักที่มีเสียงดัง หรือเสียงดัง
3. จัดตั้งความเร่ง รวมรถบรรทุกที่จอดอยู่ ไม่เกิน 30 กิโลเมตร/ชั่วโมง ในช่วงที่ฝนฟ้าคะนอง และไม่เกิน 40 กิโลเมตร/ชั่วโมง ในพื้นที่ทั่วไป ห้ามใช้ไฟส่องสว่างที่ติดตั้งในรถบรรทุก

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		QC		
22		Fitter A		



# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา)

สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ

(ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

10 Jan 2023

เวลา (Time)

สถานที่ (Location)

YT Site office

จำนวนผู้เข้าอบรม (No. of participants)

29

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. การเดินเครื่องจักรกลหนักที่มีเสียงดัง ดังต่อไปนี้แจ้งให้ทราบ ไม่ควรสวมใส่หน้ากากอนามัย และควรใช้ถุงมือ

2. ห้ามเดินบนสายไฟฟ้า หรือใกล้สายไฟฟ้า

3. ห้ามเดินบนสายไฟฟ้า หรือใกล้สายไฟฟ้า ไม่ให้เดิน 30 กิโลเมตร/ชั่วโมง ในพื้นที่อันตราย ห้ามเดินบนสายไฟฟ้า หรือใกล้สายไฟฟ้า ไม่ให้เดิน 30 กิโลเมตร/ชั่วโมง ในพื้นที่อันตราย ห้ามเดินบนสายไฟฟ้า หรือใกล้สายไฟฟ้า ไม่ให้เดิน 30 กิโลเมตร/ชั่วโมง ในพื้นที่อันตราย

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
23		Fitter A		
24		Fitter B		
25		Fitter B		
26		Fitter B		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Welder		
33		Worker		
34				
35				
36				
37				
38				
39				
40				





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

14 Jan 2023

เวลา (Time)

สถานที่ (Location)

VI Site Office

จำนวนผู้เข้าอบรม (No. of participant)

29

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. สวมใส่อุปกรณ์ป้องกันอันตรายส่วนบุคคล ตลอดเวลาที่ปฏิบัติงาน ขณะเบรคร่วมกับรถเครน งานก่อสร้าง
2. ห้ามใช้โทรศัพท์ ขณะเดินรถจักร ห้ามปฏิบัติงานควบคู่กันกับรถเครน ไม่ควรไปใกล้รถเครน หรือรถบรรทุกใกล้ตัวรถเครน
3. การปฏิบัติงานให้มีเขตปลอดภัย

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		QC		
22		Fitter A		





การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา)

สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ  
(ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

14 Jan 2023

เวลา (Time)

สถานที่ (Location)

YJ site office

จำนวนผู้เข้าอบรม (No. of participants)

29

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ตามไฟล์อุปกรณ์ 5 รายการอันตราย ส่วนบุคคลตลอดการปฏิบัติงาน เคารพ: สวมกบส์กันชน, วน  
กัศกร

2. เมื่อมีการ 5 ตัวได้ 4 ตัว บำรุงปฏิบัติงาน คือไปไม่รอด ไม่ดี-ไม่ดี หรือบริเวณใกล้ เคียง  
จึงเกิดอุบัติเหตุจากการทำงาน ของตัว 5 ตัว

3. การปฏิบัติ สำหรับเกิดเหตุการณ์

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
23		Fitter A		
24		Fitter B		
25		Fitter B		
26		Fitter B		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Welder		
33		Worker		
34				
35				
36				
37				
38				
39				
40				



ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		Fitter A		





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

## (Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบผลิตไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

10 Feb 2023

เวลา (Time)

สถานที่ (Location)

YJ Site office

จำนวนผู้เข้าอบรม (No. of participant)

30

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. อบรมความปลอดภัยและกฎเกณฑ์การทำงานที่ไซต์งาน ย้ายท่อไปป์ ทางท่อแก๊สบุรีรัมย์-ฉะเชิงเทรา
2. เมื่อมีการขุดเจาะเสร็จแล้ว ห้ามไปปฏิบัติงานเข้าไปในรัศมี 1 เมตร - 1.5 เมตร บริเวณที่ขุดเจาะที่ขุดเจาะเสร็จแล้ว
3. ห้ามใส่อุปกรณ์มือที่อื่น อื่นๆเข้ามาในรัศมีของท่อที่ย้ายท่อไปป์ และห้ามสวมหมวกกันน็อก

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
22		Fitter A		
23		Fitter B		
24		Fitter B		
25		Fitter B		
26		Welder		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Worker		
33				
34				
35				
36				
37				
38				
39				





# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

## (Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

11 Feb 2023

เวลา (Time)

สถานที่ (Location)

YT Site office

จำนวนผู้เข้าอบรม (No. of participants)

28

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. วิธีการในการขุดเจาะพื้นที่ และความปลอดภัยในการทำงาน

2. การควบคุมความปลอดภัย

3. การปฏิบัติงานเมื่อเกิดอุบัติเหตุ

4. ความปลอดภัยในการทำงาน ส่วนบุคคล และความปลอดภัยในการทำงาน และแนวทางปฏิบัติ

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Back hoe driver		
3		Safety technic		
4		Worker		
5		Engineer		
6		Engineer		
7		Worker		
8		Safety technic		
9		Worker		
10		Worker		
11		Worker		
12		Worker		
13		Worker		
14		Worker		
15		Worker		
16		Worker		
17		Worker		
18		Worker		
19		Worker		
20		Engineer		
21		Fitter A		



# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบท่อส่งก๊าซธรรมชาติเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

11 Feb 2023

เวลา (Time)

สถานที่ (Location)

YJ site office

จำนวนผู้เข้าอบรม (No. of participants)

28

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ระยะเวลาในการก่อสร้างเบื้องต้น และ การปฏิบัติงานตามเขตก่อสร้าง
2. การประเมินความเสี่ยงเบื้องต้น
3. การปฏิบัติงานที่ปลอดภัยและสุขภาพจิต
4. ความปลอดภัยในการทำงาน และ การดูแลสุขภาพจิตของบุคลากร และ การปฏิบัติงาน และ การดูแลสุขภาพจิตของบุคลากร

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
22		Fitter A		
23		Fitter B		
24		Fitter B		
25		Fitter B		
26		Welder		
27		Welder		
28		Welder		
29		Welder		
30		Welder		
31		Welder		
32		Worker		
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่าอากาศยาน เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการก่อสร้างฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการก่อสร้างฯ นวนคร-รังสิต)

วันที่ (Date)

16 กุมภาพันธ์ 66

เวลา (Time)

9:35 น.

สถานที่ (Location)

อ.พ.พ. MR วัฒน

จำนวนผู้เข้าอบรม (No. of participants)

7

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

- ตรวจสอบก๊าซ ก่อนเริ่มทำงาน และระบ่งทำงาน
- ตรวจสอบ PPE ในจุดต้องตามคำสั่งงาน
- งานพื้นที่ มีผู้ต้อง นามไฟไม่ใกล้ของเขื่อน
- เตรียม จัดตั้งอุปกรณ์ 2 ตัว รถพ่วง 1 คัน รถอู่เหล็ก
- ทดสอบอุปกรณ์ไฟฟ้าตามปกติของงาน ใช้ Tie in

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		Welder		
3		Helper		
4		Welder		
5		Safety		
6		Helper		
7		Helper		
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

15 กรกฎาคม 66

เวลา (Time)

09:30 น.

สถานที่ (Location)

MP - Rangsit

จำนวนผู้เข้าอบรม (No. of participants)

11 คน

ผู้ทำการอบรม (Name of Instructor)

[Redacted]

Engineer/Supervisor

[Redacted]

หัวข้ออบรม (Topic)

- ปฏิบัติงานตามขั้นตอนความปลอดภัย ของงานประกอบ Tie-in
- ตรวจวัดก๊าซก่อนเริ่ม และ ระหว่างทำงาน
- เตรียม รัดเข็มขัดนิรภัย รัดหมวกนิรภัย และใส่หน้ากากป้องกันฝุ่น
- กำหนดพื้นที่ทำงาน ปิดกั้นอุปกรณ์ไฟ และติดมีดเตือน
- สวมใส่ PPE ให้ถูกต้องตามลักษณะงาน

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1	[Redacted]	Helper	[Redacted]	
2		Helper		
3		Helper		
4		Helper		
5		Safety		
6		Torwan		
7		Engineer		
8		welder		
9		welder		
10		Nurse		
11		fireman		
12				
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อม โยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ- นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date) 13 Mar 2023 เวลา (Time) 08:00  
สถานที่ (Location) YJ site office  
จำนวนผู้เข้าอบรม (No. of participants) 14 คน  
ผู้ทำการอบรม (Name of Instructor) [Redacted]  
Engineer/Supervisor [Redacted]

หัวข้ออบรม (Topic)

1. ฝึกอบรมความรู้เรื่องรถยกจัดก่อสร้าง ไม่ให้เกิน 30 กิโลเมตร/ชั่วโมง ในพื้นที่ชุมชน
2. ห้ามทิ้งขยะ: เสื่อเตาหุงต้ม ลังข้าว ลังใน แล่งน้ำ
3. ความรู้ PPE ในรั้วของเขตผลิตและขนถ่าย

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1	[Redacted]	Safety	[Redacted]	
2		Engineer		
3		store		
4		Engineer		
5		worker		
6		worker		
7		worker		
8		worker		
9		worker		
10		foreman		
11		worker		
12		worker		
13		worker		
14		worker		
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# การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน

(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบผลิตไฟฟ้าความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

28 Mar 2023

เวลา (Time)

08:00

สถานที่ (Location)

UJ site office

จำนวนผู้เข้าอบรม (No. of participants)

11

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1 อธิบายให้คนกรอกบันทึก เรื่อง ขั้นตอนงานท่อ

2 การป้องกันความปลอดภัย

3 เกม เว: 15 นาที 10 นาที 5 นาที 1 นาที

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Engineer		
2		safety		
3		worker		
4		worker		
5		worker		
6		worker		
7		worker		
8		worker		
9		worker		
10		worker		
11		fireman		
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการถ่ายทอดก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date)

4 มกราคม 2566

เวลา (Time)

8:00

สถานที่ (Location)

ออฟฟิศโครงการ YJ

จำนวนผู้เข้าอบรม (No. of participants)

6

คน

ผู้ทำการอบรม (Name of Instructor)

Engineer/Supervisor

หัวข้ออบรม (Topic)

1. ตรวจสอบอุปกรณ์ไฟฟ้า ท่อส่งก่อนเริ่มทำงาน

2. ความปลอดภัย PPE ในการทำงานท่อส่ง

3. แผนฉุกเฉิน กรณีเกิดอุบัติเหตุ

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1		Safety		
2		Engineer		
3		Worker		
4		Worker		
5		Worker		
6		Worker		
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่าก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2 (โครงการก่อสร้างฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการก่อสร้างฯ นวนคร-รังสิต)

วันที่ (Date) 12 มิถุนายน 2566 เวลา (Time) 08:00  
สถานที่ (Location) ๗๗ ฟิสทอรา 75  
จำนวนผู้เข้าอบรม (No. of participants) 6 คน  
ผู้ทำการอบรม (Name of Instructor) [Redacted]  
Engineer/Supervisor [Redacted]  
หัวข้ออบรม (Topic)

- 1 ปฏิบัติงานตามข้อกำหนดของความปลอดภัย ตามแบบแผนปฏิบัติงาน ตามแบบ JSEA
- 2 แนวทางรับมือป้องกันโรคที่ติดจากการทำงาน Heat stroke

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1	[Redacted]	Engineer	[Redacted]	
2		Worker		
3		Worker		
4		Safety		
5		Worker		
6		Worker		
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การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการท่อส่งก๊าซฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) และโครงการท่อส่งก๊าซฯ นวนคร-รังสิต)

วันที่ (Date) 18 พฤษภาคม 2566 เวลา (Time) 09:00 น.  
สถานที่ (Location) ไซต์งาน MR ฝั่งบึงกุ่ม  
จำนวนผู้เข้าอบรม (No. of participants) 17 คน  
ผู้ทำการอบรม (Name of Instructor) [Redacted]  
Engineer/Supervisor [Redacted]  
หัวข้ออบรม (Topic)

1. จัดเตรียมพร้อมแผนฉุกเฉิน เส้นทางอพยพ รถดับเพลิง รถพยาบาล รถรวมของ
2. กันพื้นที่ การทำงานจัดช่างติดตั้งท่อส่งก๊าซ
3. ปฏิบัติงานตามขั้นตอน และปฏิบัติตามคำสั่งจากหัวหน้างานเท่านั้น
4. สมาชิกอุปกรณ์วัดแรงดัน ท่อ Gas

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1	[Redacted]	Safety Manager	[Redacted]	
2	[Redacted]	วิศวกร	[Redacted]	
3	[Redacted]	ช่าง	[Redacted]	
4	[Redacted]	ช่าง	[Redacted]	
5	[Redacted]		[Redacted]	
6	[Redacted]	ช่าง	[Redacted]	
7	[Redacted]	ช่าง	[Redacted]	
8	[Redacted]	ช่าง	[Redacted]	
9	[Redacted]	Site Engineer	[Redacted]	
10	[Redacted]	ช่าง	[Redacted]	
11	[Redacted]	ช่าง	[Redacted]	
12	[Redacted]	Safety	[Redacted]	
13	[Redacted]	QC	[Redacted]	
14	[Redacted]		[Redacted]	
15	[Redacted]		[Redacted]	
16	[Redacted]		[Redacted]	
17	[Redacted]	SHE	[Redacted]	
18	[Redacted]		[Redacted]	
19	[Redacted]		[Redacted]	
20	[Redacted]		[Redacted]	





การอบรมความปลอดภัยก่อนเริ่มปฏิบัติงาน  
(Safety/Tool Box Talk)



โครงการย้ายท่าอากาศยาน เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและรัฐบาลแห่งสาธารณรัฐประชาชนจีน ในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาคช่วงที่ 1 กรุงเทพฯ-หนองคาย (ระยะที่ 1 ช่วงกรุงเทพฯ-นครราชสีมา) สัญญา 4-2 (โครงการก่อสร้างฯ ศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ

(ปทุมธานี-พญาไท) และโครงการก่อสร้างฯ นวนคร-รังสิต)

วันที่ (Date) 19-5-66 เวลา (Time) 11:00 น.  
สถานที่ (Location) BV-17  
จำนวนผู้เข้าอบรม (No. of participants) 15 คน  
ผู้ทำการอบรม (Name of Instructor) [Redacted]  
Engineer/Supervisor [Redacted]  
หัวข้ออบรม (Topic)

1. แจ้งแผนการทำงานประจำวัน และขั้นตอนการทำงานอย่างปลอดภัย
2. แจ้งแผนฉุกเฉิน เบอร์ติดต่อ และอุปกรณ์คุ้มครองความปลอดภัย
3. เตรียมความพร้อมบริเวณพื้นที่ทำงาน ย้ายเครื่องจักร และ Car Detector
4. สมาชิกกลุ่ม PPE ในลักษณะตาม จก ๗๗๗
5. ตรวจสอบสภาพ LEC ทั่วๆ ไป และบริเวณที่ทำงานตามที่ระบุใน สัญญาการทำงาน อย่างรัดกุม

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลงชื่อ	หมายเหตุ
1	[Redacted]	Safety		
2	[Redacted]	ช่าง		
3	[Redacted]	ช่าง		
4	[Redacted]	ช่าง		
5	[Redacted]	ช่าง		
6	[Redacted]	ช่าง		
7	[Redacted]	ช่าง		
8	[Redacted]	ช่าง		
9	[Redacted]	ช่าง		
10	[Redacted]	ช่าง		
11	[Redacted]	ช่าง		
12	[Redacted]	ช่าง		
13	[Redacted]	ช่าง		
14	[Redacted]	ช่าง		
15	[Redacted]	PTT INSPECTOR		
16				
17				
18				
19				
20				











บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม (ระยะก่อสร้าง)

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท)

(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

ภาคผนวก 2-7

ตัวอย่างเอกสารระเบียบขั้นตอนการจัดการข้อร้องเรียน

กรกฎาคม 2566



3/4 ถนนประดิษฐมนูกิจ แขวงคลองกุ่ม เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



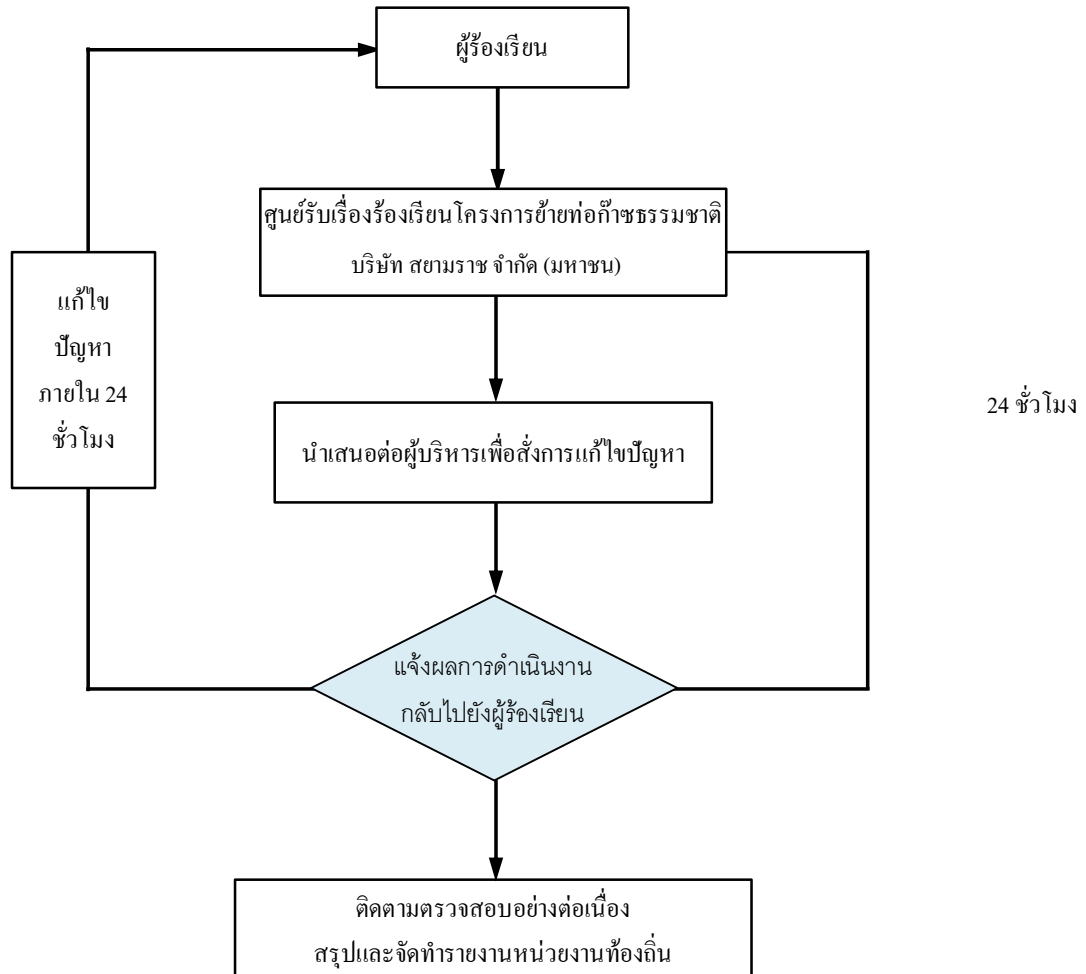
[www.enticcompany.com](http://www.enticcompany.com)



ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด

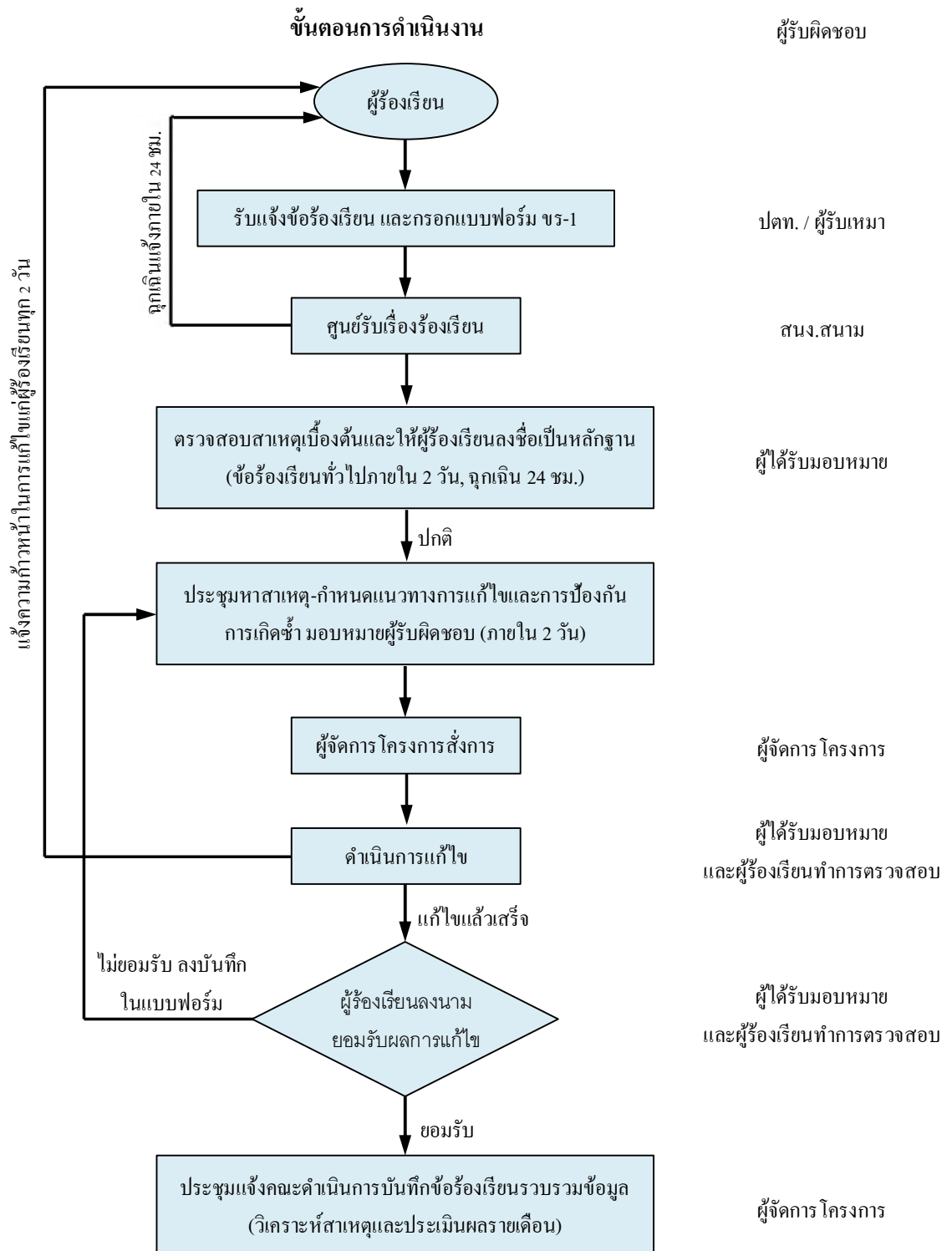


## แผนผังการรับข้อร้องเรียนกรณีฉุกเฉินหรือเร่งด่วน





## ผังการดำเนินงานรับข้อร้องเรียน กรณีทั่วไป







SIAMRAJ PUBLIC COMPANY LIMITED

บริษัท สยามราช จำกัด (มหาชน)

เลขที่ □□

□□-□□□/□□

### แบบฟอร์มข้อร้องเรียน

พื้นที่โครงการ ช่วง KP ..... ถึง KP ..... วันที่ .....

อยู่ในพื้นที่หมู่บ้าน ..... ตำบล ..... อำเภอ ..... จังหวัด .....

#### ข้อมูลผู้ร้องเรียน

ชื่อ-นามสกุล นาย/นาง/นางสาว ..... อาชีพ .....

ที่อยู่ ..... เบอร์โทรศัพท์ .....

#### ข้อร้องเรียน /ข้อเสนอแนะ

รายละเอียด	ข้อเสนอแนะและแนวทางการแก้ไข

..... ลงชื่อ

ผู้ร้องเรียน

\*ลงชื่อผู้ร้องเรียนเมื่อไปดูพื้นที่ร่วมกับเจ้าหน้าที่

#### สำหรับเจ้าหน้าที่

สิ่งที่พบหรือเหตุการณ์ที่พบ .....

#### สาเหตุเบื้องต้น

- ☐ การไม่ปฏิบัติตามมาตรการป้องกันแก้ไขผลกระทบสิ่งแวดล้อม
- ☐ การไม่ปฏิบัติตามกฎ ข้อกำหนด และสัญญา โดยผู้รับเหมา
- ☐ ความล่าช้าในการดำเนินงาน
- ☐ ความไม่เหมาะสมหรือไม่ถูกต้องในการปฏิบัติงาน
- ☐ ความไม่เรียบร้อยหรือไม่เป็นไปตามข้อตกลงของงานที่ปฏิบัติแล้วเสร็จ
- ☐ อื่น ๆ (ระบุ) .....

#### ประเภทข้อร้องเรียน

- ☐ ด้านก่อสร้าง
- ☐ ด้านสิ่งแวดล้อม
- ☐ ความปลอดภัยและสุขภาพอนามัย
- ☐ อื่น ๆ (ระบุ) .....

..... ลงชื่อ

ผู้รับข้อร้องเรียน

..... / ..... / .....



บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

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(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

ภาคผนวก 2-8

ตัวอย่างเอกสารขั้นตอนการควบคุมโรคติดต่อ  
และโรคระบาดร้ายแรง (COVID-19) ภายในโครงการ

กรกฎาคม 2566



3/4 ถนนประดิษฐ์มนูกิจ แขวงคลองกุ่ม เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



[www.enticcompany.com](http://www.enticcompany.com)




ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด

## มาตรการป้องกันโควิด-19

- โปรดขอคำแนะนำที่เหมาะสมกับภูมิภาคของคุณที่สุดจากหน่วยงานด้านสาธารณสุขในท้องถิ่น
- วิธีป้องกันการแพร่ระบาดของโควิด-19
- รักษาระยะห่างที่ปลอดภัยจากผู้อื่น (อย่างน้อย 1 เมตร) แม้ว่าผู้อื่นจะไม่ป่วยก็ตาม
  - สวมหน้ากากอนามัยในที่สาธารณะ โดยเฉพาะเมื่ออยู่ในพื้นที่ปิดหรือเว้นระยะห่างไม่ได้
  - หลีกเลี่ยงพื้นที่ปิด พยายามอยู่ในพื้นที่เปิด โถงและอากาศถ่ายเทสะดวก เปิดหน้าต่างเมื่ออยู่ในพื้นที่ปิด
  - ถ้ามีบ่อยๆ โดยใช้สบู่และน้ำ หรือเจลล้างมือที่มีส่วนผสมหลักเป็นแอลกอฮอล์
  - รับวัคซีนเมื่อได้รับสิทธิ์ ปฏิบัติตามหลักเกณฑ์ในพื้นที่เกี่ยวกับการฉีดวัคซีน
  - ปิดจมูกและปากด้วยข้อพับด้านในข้อศอกหรือกระดาษชำระเมื่อไอหรือจาม
  - เก็บตัวอยู่บ้านเมื่อรู้สึกไม่สบาย
  - หากมีไข้ ไอ และหายใจลำบาก โปรดไปพบแพทย์ โดยติดต่อล่วงหน้าเพื่อให้บริการด้านสุขภาพจะได้แนะนำให้คุณไปยังสถานพยาบาลที่ถูกต้อง ซึ่งจะช่วยปกป้องคุณ รวมถึงป้องกันการแพร่กระจายของไวรัสและการติดเชื้ออื่นๆ
  - หน้ากากอนามัย
  - หน้ากากอนามัยที่ระดับกับใบหน้าช่วยป้องกันไม่ให้ผู้ที่สวมแพร่กระจายไวรัสไปยังผู้อื่น อย่างไรก็ตาม หน้ากากอนามัยเพียงอย่างเดียวป้องกันเชื้อโควิด-19 ไม่ได้ จึงควรรักษาระยะห่างและหมั่นทำความสะอาดมือร่วมด้วย รวมถึงปฏิบัติตามคำแนะนำจากหน่วยงานด้านสาธารณสุขในท้องถิ่น



# มาตรการป้องกันโควิด-19



## มาตรการป้องกัน COVID-19


CORONAVIRUS DISEASE 2019

### กรมสวัสดิการและคุ้มครองแรงงาน

**1.** สวมหน้ากากอนามัย ขณะปฏิบัติงานหรือทำกิจกรรมร่วมกับผู้อื่น

★ ล้างมือด้วยแอลกอฮอล์เจล


★ หากมีอาการป่วยให้ไปพบแพทย์




**2.** หลีกเลี่ยงการอยู่ในสถานที่แออัด

★ รับประทานอาหารปรุงสุกตามหลัก "กินร้อน ช้อนกลาง ล้างมือ"


★ ไม่ใช้ของส่วนตัวร่วมกับผู้อื่น




**3.** งดหรือเลื่อนการเดินทางไปยังประเทศที่มีความเสี่ยงต่อการติดเชื้อ ตามประกาศของกระทรวงสาธารณสุข




**4.** หากเดินทางกลับจากประเทศที่มีความเสี่ยงติดเชื้อ ให้เข้ารับการตรวจคัดกรองจากสถานพยาบาลโดยเร็ว ในระยะเวลา 14 วัน นับจากวันที่กลับเข้าไทย ให้สังเกตอาการและระมัดระวังตนเอง




**5.** กรณีที่เจ้าหน้าที่ของกรมฯ ถูกเจ้าพนักงานควบคุมโรคติดต่อ มีคำสั่งให้กักตัวไว้ที่ศูนย์ควบคุมโรคเป็นเวลา 14 วัน ให้ปฏิบัติตามคำสั่งและคำแนะนำดังกล่าว พร้อมกับรายงานให้ผู้บังคับบัญชาทราบโดยเร็ว




**6.** ตรวจคัดกรองเจ้าหน้าที่ ประชาชน หรือผู้ที่มาติดต่อราชการทุกคน ณ บริเวณก่อนเข้าสถานที่ทำงาน



**7.** ติดตั้งแอลกอฮอล์ล้างมือ ให้กับเจ้าหน้าที่ ประชาชน หรือผู้มาติดต่อราชการ ไว้ล้างมือได้บ่อยครั้ง



**8.** ทำความสะอาดอุปกรณ์และบริเวณที่มีการสัมผัสบ่อยๆ เช่น โต๊ะทำงาน คอมพิวเตอร์ ที่จับประตู ห้องน้ำ ราวบันได ลิฟท์โดยสาร รถยนต์ส่วนกลาง เป็นต้น



กรมสวัสดิการและคุ้มครองแรงงาน กระทรวงแรงงาน [www.labour.go.th](http://www.labour.go.th)

# มาตรการป้องกันโควิด-19



กรมสวัสดิการและคุ้มครองแรงงาน ขอความร่วมมือนายจ้าง ลูกจ้าง  
ปฏิบัติตามแนวทาง **มาตรการเฝ้าระวังการป้องกันโรคระบาด**

**COVID-19**  
CORONAVIRUS DISEASE 2019

- 1.** นายจ้างให้ความรู้ คำแนะนำ เกี่ยวกับ การป้องกันโรคระบาดจากเชื้อไวรัส COVID-19 ให้แก่ลูกจ้าง

จัดหาสบู่ เจลล้างมือแอลกอฮอล์ ภายใต้อาณัติประกอบกิจการ


- 2.** นายจ้าง ที่มีลูกจ้างทำงานรวมกัน จำนวนมาก ควรตรวจคัดกรอง ลูกจ้างทุกคนก่อนเข้าทำงาน

★ กรณีที่พบลูกจ้างป่วยจำนวนมาก ให้พิจารณาหยุดการปฏิบัติงาน หรือบางส่วนชั่วคราว เพื่อให้ลูกจ้าง พักฟื้นตัวและลดการแพร่เชื้อโรค


- 3.** หากมีลูกจ้างเดินทางไปยังประเทศ ที่มีความเสี่ยงติดเชื้อโรค COVID-19 เมื่อกลับถึงประเทศไทยให้ลูกจ้างไม่ตรวจ คัดกรองและเฝ้าระวังตามระเบียบ ประกาศ และมาตรการตามที่กระทรวงสาธารณสุข กำหนด


- 4.** นายจ้างตรวจพบว่าลูกจ้างมีความเสี่ยง ที่จะติดโรค COVID-19 ไม่ว่าจะได้รับการ ตรวจคัดกรองโรคที่โรงพยาบาลหรือไม่ก็ตาม หากผลการตรวจคัดกรองยืนยันว่า มีความเสี่ยง ติดเชื้อ ถูกแยกกักหรือกักกันตัว จนเป็นเหตุ ให้ไม่สามารถมาปฏิบัติงานได้ ให้นายจ้างแจ้งพนักงานตรวจแรงงาน กรมสวัสดิการและคุ้มครองแรงงาน


- 5.** เมื่อลูกจ้างพบว่าตัวเองมีความเสี่ยง ที่จะติดโรค COVID-19 ให้ไปรับ การตรวจรักษาหรือรับการชันสูตร ทางการแพทย์ และแจ้งให้นายจ้างทราบ เพื่อแจ้งเจ้าพนักงานควบคุมโรคโดยเร็ว


- 6.** หากลูกจ้างถูกเจ้าพนักงานควบคุมโรคติดต่อ กักตัวไว้ที่ศูนย์ควบคุมโรคระยะเวลา 14 วัน ให้ลูกจ้างปฏิบัติตามคำสั่ง ค่าตอบแทน พนักงานเจ้าหน้าที่โดยเคร่งครัด


- 7.** กรณีให้ลูกจ้างมีความเสี่ยงที่จะติดโรค COVID-19 จำเป็นต้องไปรับการตรวจรักษาหรือรับการชันสูตร ทางการแพทย์ ให้นายจ้างอนุญาตให้ลูกจ้างใช้สิทธิ ลาป่วยหรือลาพักผ่อนประจำปีตามกฎหมายหรือ ตามที่ตกลงกับ





หากนายจ้าง ลูกจ้าง มีข้อสงสัยเกี่ยวกับสิทธิ หน้า ที่ การปฏิบัติตามแนวทางนี้ ให้ติดต่อสอบถามได้ที่

- ★ สำนักงานสวัสดิการและคุ้มครองแรงงานทุกจังหวัด
- ★ สำนักงานสวัสดิการและคุ้มครองแรงงานกรุงเทพมหานครทุกพื้นที่
- ★ สายด่วน 1506 กด 3 หรือ 1546







## คำแนะนำ



# กรณีพบผู้ติดเชื้อโควิด-19



## สำหรับหน่วยงานต่างๆ และที่อยู่อาศัย

### บุคคล



ให้พนักงาน/ผู้พักอาศัย หยุดงานทันที และแยกตัวเองออกจากผู้อื่น



แจ้งเจ้าพนักงานควบคุมโรคติดต่อ หน่วยงานสาธารณสุขในพื้นที่ภายใน 3 ชั่วโมง เพื่อควบคุมโรคและคัดกรองกลุ่มเสี่ยง



ผู้ที่มีความเสี่ยงสูง ให้รีบพบแพทย์ทันที และกักตัวเอง 14 วัน



ผู้ที่มีความเสี่ยงต่ำ แยกตัวเอง เพื่อสังเกตอาการ 14 วัน หากมีอาการให้รีบพบแพทย์ทันที

### สถานที่



หยุดกิจกรรมในแผนก/ชั้น ที่มีคนติดเชื้อ เพื่อทำความสะอาด 1-3 วัน



พนักงาน/ผู้พักอาศัย ทำความสะอาดสิ่งของที่ใช้งานบ่อยๆ เช่น โต๊ะทำงาน/โทรศัพท์



ทำความสะอาดบริเวณที่มีผู้สัมผัสจำนวนมาก เช่น ราวจับบันได/ลูกบิดประตู/ห้องน้ำ/ลิฟต์



ระมัดระวังการเก็บขยะติดเชื้อ เช่น กิ๊ชชู่ที่ผ่านการใช้งานแล้ว ผนังกากอนามัย ให้ใส่ถุงขยะสีแดงและปิดปากถุงให้มิดชิด



ผู้ปฏิบัติการทำความสะอาด ต้องสวมอุปกรณ์ส่วนบุคคล เช่น ถุงมือ ผ้ากั้นเบื่อน ผ้าปิดจมูก และรองเท้าพื้นยางหุ้มข้อตลอดเวลา

### ระบบ/สภาพแวดล้อม



ติดตั้งเครื่องวัดอุณหภูมิ



จุดจ่ายแอลกอฮอล์เจล



จัดการแยก/ทำลายขยะติดเชื้อ



จัดการระบบระบายอากาศให้หมุนเวียนอากาศได้ทั้งวัน

แหล่งข้อมูล : กรมควบคุมโรค กระทรวงสาธารณสุข



# เบอร์โทรฉุกเฉิน แม่ไว้รับมือ COVID-19

1442

## กรมควบคุมโรค

ในกรณีที่มีอาการเข้าข่ายสงสัยติดเชื้อ  
ไวรัสโคโรนา 2019 หรือ COVID-19

1669

## สถาบันการแพทย์ ฉุกเฉิน

นำส่งผู้ป่วย หรือผู้สงสัยว่า  
ติดเชื้อ COVID-19 สู่สถานพยาบาล

1111

## ศูนย์บริการข้อมูล ภาครัฐเพื่อประชาชน

แจ้งข้อมูลที่ถูกส่งให้กับประชาชน หรือกรณี  
ต้องการร้องเรียนเกี่ยวกับสถานการณ์ COVID-19  
เช่น พบหน้าท่อน้ำขยะกับราคา

1330

## สำนักงานหลักประกัน สุขภาพแห่งชาติ

สิทธิการรักษา สอนแกนหลักประโยชน์  
ในระบบหลักประกันสุขภาพแห่งชาติ  
หรือขอรับคำปรึกษากับเจ้าหน้าที่

1506

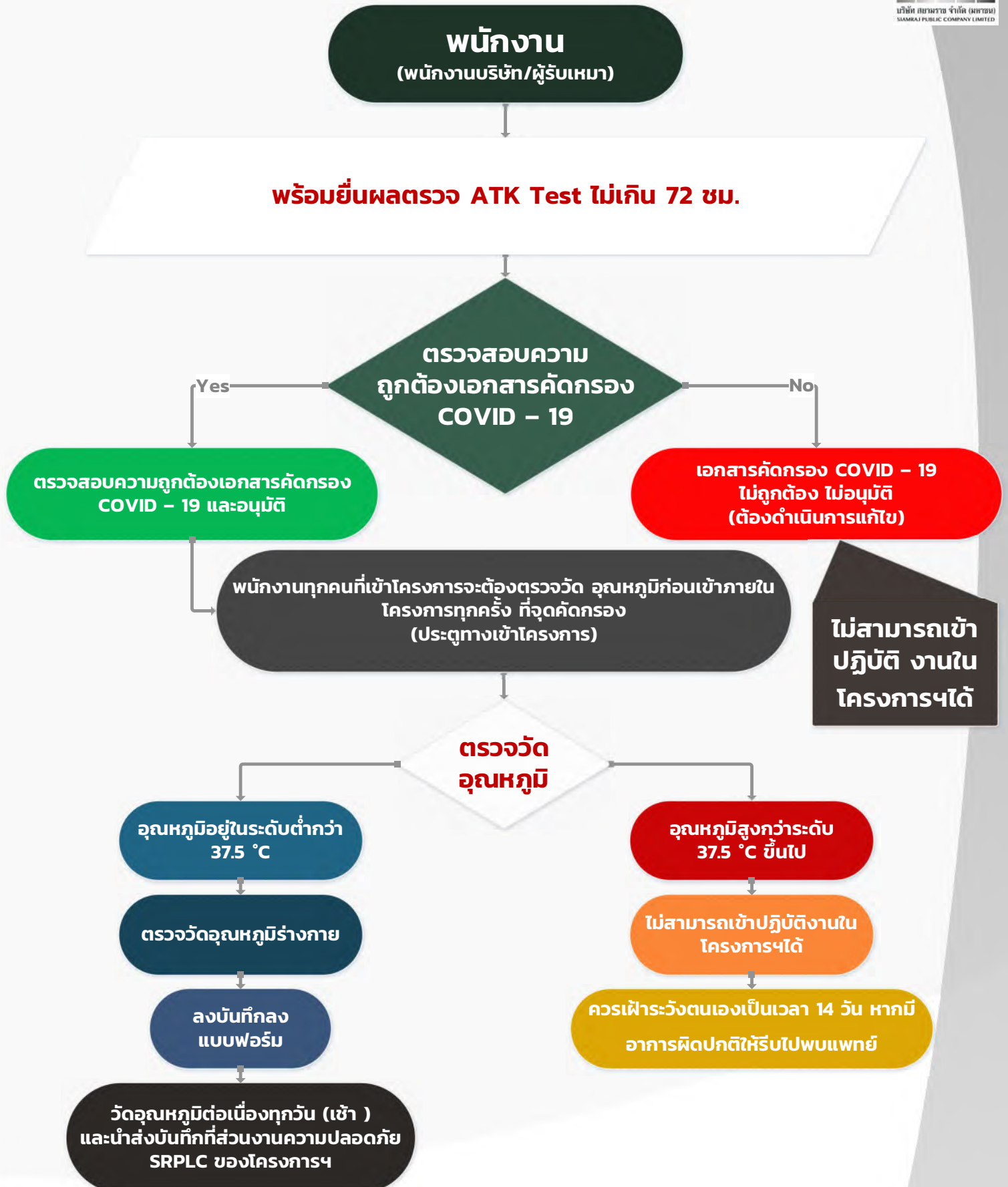
## สายด่วนประกันสังคม

สำหรับผู้ประกันตนที่ต้องการสอบถามสิทธิ  
ประกันสังคมในกรณีติดเชื้อ COVID-19  
และสอบถามมาตรการเยียวยาต่างๆ สำหรับ  
ผู้ประกันตนที่ได้รับผลกระทบ กรณีเลิกจ้าง  
หรือถูกจ้างงานเนื่องในสถานการณ์ COVID-19

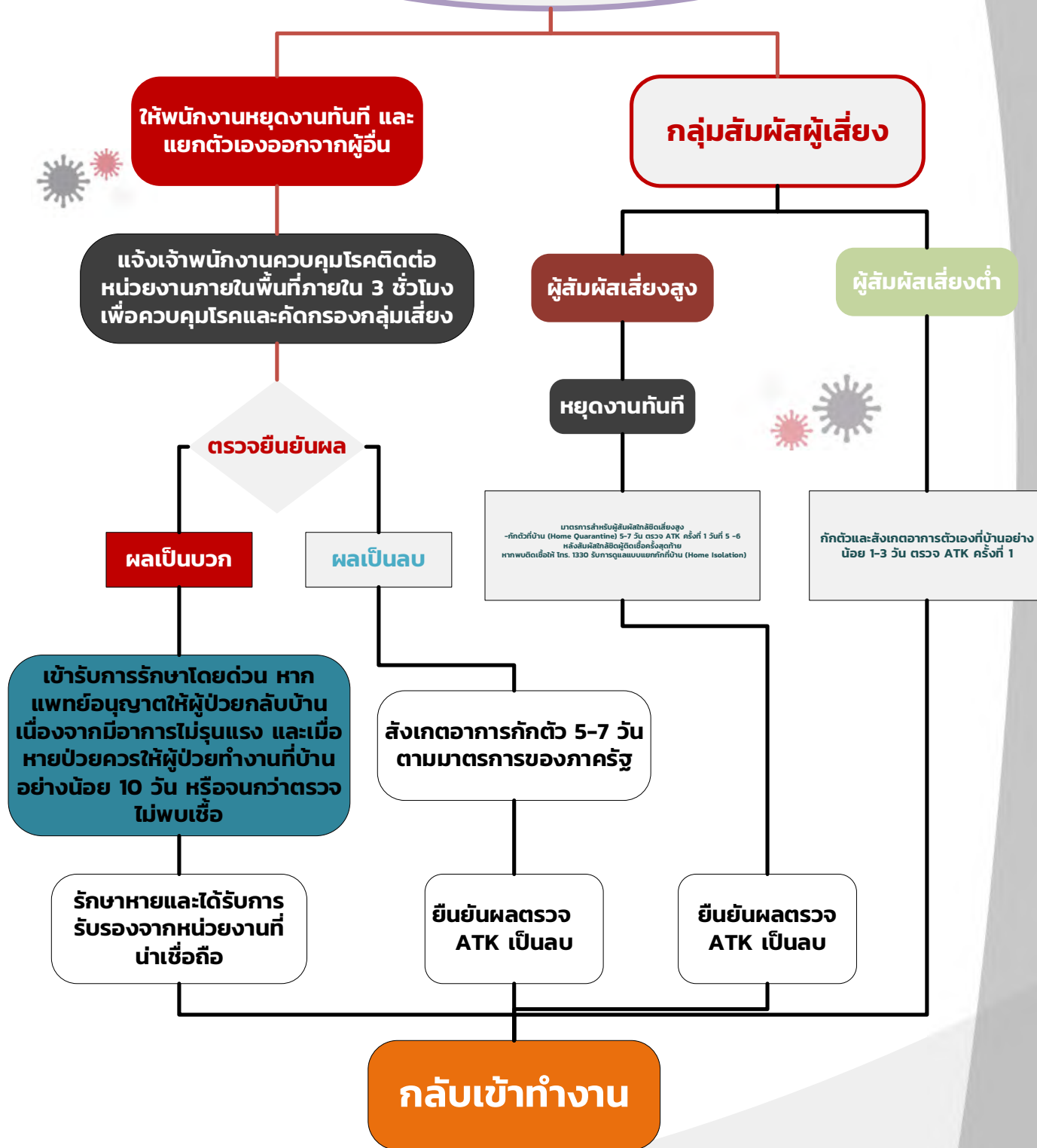


**กรุงเทพประกันภัย**  
**Bangkok Insurance**

# มาตรการการคัดกรอง COVID-19 สำหรับพนักงาน



# กรณีพบผู้ต้องสงสัยว่าติด เชื้อหรือติดเชื้อโควิด-19







บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม (ระยะก่อสร้าง)

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท)

(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

ภาคผนวก 2-9

ตำแหน่งติดตั้งกำแพงกันเสียงชั่วคราวในระยะก่อสร้างโครงการ

กรกฎาคม 2566



3/4 ถนนประดิษฐ์มนูกิจ แขวงคลองกุ่ม เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



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ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด





บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบผลกระทบสิ่งแวดล้อม (ระยะก่อสร้าง)

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท)

(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

โครงการก่อสร้างก๊าซธรรมชาติศูนย์ราชการแจ้งวัฒนะและศูนย์พลังงานแห่งชาติ (ปทุมธานี-พญาไท) (ครั้งที่ 1))

ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

ภาคผนวก 2-10

ตัวอย่างเอกสารระเบียบขั้นตอนงานเชื่อมต่อท่อ

กรกฎาคม 2566



3/4 ถนนประดิษฐ์มนูกิจ แขวงคลองจั่น เขตบึงกุ่ม กรุงเทพมหานคร 10240



โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



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ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด







**PTT PUBLIC COMPANY LIMITED**

โครงการย้ายท่อก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลแห่งราชอาณาจักรไทยและ  
รัฐบาลแห่งสาธารณรัฐประชาชนจีนในการพัฒนาระบบรถไฟความเร็วสูงเพื่อเชื่อมโยงภูมิภาค  
ช่วงที่ 1 กรุงเทพฯ - นครราชสีมา (ระยะที่ 1 ช่วงกรุงเทพ - นครราชสีมา) สัญญา 4-2  
(RE-ROUTE PTT PIPELINE HSR 4-2)

DOCUMENT TITLE:	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	
DOCUMENT NO.:	PR-W-2102.18-010-001	REVISION: C

REVIEW STAMP	COMMENTS
<input type="checkbox"/> E : Approved for Construction.	
<input type="checkbox"/> F : Work may proceed. Submit for Construction	
<input type="checkbox"/> G : Revise and Resubmit. Work may proceed subject to incorporation of changes indicated.	
<input type="checkbox"/> H : Revise and Resubmit. Work may not proceed.	
<input type="checkbox"/> I : Review not required. Work may proceed.	
Name : _____	
Sign : _____ Date : _____	


C	11/4/2022	Re-Issued for Approval	SPT	YI	PT
B	9/3/2022	Re-Issued for Approval	SPT	YI	PT
A	24/1/2022	Issued for Approval	KA	YI	PT
Rev.	Date	Description	Prepared By	Checked By	Approved By
CONTRACTOR: SIAMRAJ PUBLIC COMPANY LIMITED					

	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	<b>RE-ROUTE PTT PIPELINE HSR 4-2</b>	
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	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	<b>RE-ROUTE PTT PIPELINE HSR 4-2</b>	
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## 1. PURPOSE

This procedure is for the welding of GAS Pipeline Project at Block Valve, Receiving Station Gate Station Piping. The material of pipe are API 5L X42, X65, X70 API 5L Gr.B, ASTM 106 Gr.B, ASTM A 53 Gr.B, A333 -GR 6 and ASTM A234 Gr. WPB, ASTM A 105, WPHY-65, A 694 Gr.F65, ASTM A350 GR LF 2, ASTM A350 GR LF3, ASME B 16.11 ASTM A420 GR WPL 3, ASME B 16.5 Pipe Fitting with diameter 3/4" to 42", Thickness of pipe is 1.6 mm. to 20.62 mm.

## 2. SCOPE


This welding procedure is proposed for all welding work of Gas Pipeline and Gas Metering and Regulation Station Project if essential variables as describes in API 1104 are the applied welding process are GTAW+SMAW for Pipe Ø 2 7/8" to Ø 42" and GTAW for Ø 3/4" to Unlimited. This Procedure applies to all activities associated with the mainline to be adopted for the generation of the documents for the REROUTE PTT PIPELINE HSR 4-2 Project.

## 3. DEFINITION

OWNER	means	PTT Public Company Limited
CONTRACTOR	means	Siamraj Public Company Limited
WPS	means	Welding Procedure Specification
PQR	means	Procedure Qualification Record
JSEA	means	Job Safety Environmental Analysis
HSS&E	means	Health, Safety, Security and Environment
QC	means	Quality Control
ASME	means	American Society of Mechanical Engineers
API	means	American Petroleum Institute
PQR	means	Procedure Qualification Record
NDT	means	Non-Destructive Testing
NPS	means	Nominal Pipe Size
SMAW	means	Shielded Metal Arc Welding
GTAW	means	Gas Tungsten Arc Welding
HIC	means	Hydrogen Induced Cracking
SSC	means	Sulfide Stress Cracking
STT	means	A welding process to deposit a solid welding wire
TPI	means	Third Party Inspector





	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	<b>RE-ROUTE PTT PIPELINE HSR 4-2</b>	
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#### 4. REFERENCE DOCUMENTS

ASME B31.8	Gas Transmission and Distribution Piping Systems
API 1104	Standard for Welding of Pipelines and Related Facilities
SP-W-000-02	WPS FOR ABOVE GROUND PIPING

#### 5. WELDING PROCEDURE SPECIFICATIN (WPS)

Scope	NPS (inch)	Thickness (mm.)	Grade	PTT WPS No.	Project WPS No.
2	24	17.48	X42	1.4 API/12.75-D/0.188-T-0.75/Y-42	SRPLC-WPS-004
3	12	10.31	X42	1.3 API/2.375-D-12.75/0.188-T-0.75/Y-42	SRPLC-WPS-003
3	3/4	2.87	X42	1.1 API/D-2.375/T-0.188/Y-42	SRPLC-WPS-001
-	4 on 12	6.02 to 10.3	X42	WPS-P12-BP4-6.02-X42-001	SRPLC-WPS-005

#### 6. ATTACHMENT


##### 6.1 WPS for this project

- SRPLC-WPS-001
- SRPLC-WPS-003
- SRPLC-WPS-004
- SRPLC-WPS-005

##### 6.2 Reference WPS from PTT

- 1.1 API/D-2.375/T-0.188/Y-42
- 1.3 API/2.375-D-12.75/0.188-T-0.75/Y-42
- 1.4 API/12.75-D/0.188-T-0.75/Y-42
- WPS-P12-BP4-6.02-X42-001



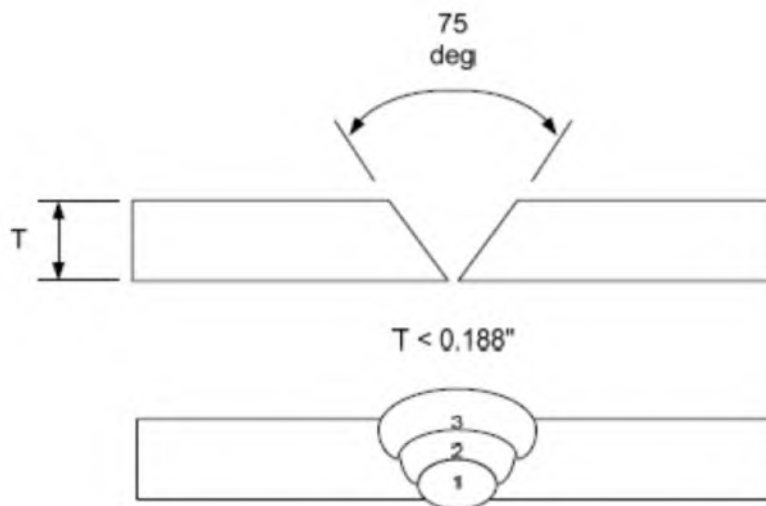
	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	<b>RE-ROUTE PTT PIPELINE HSR 4-2</b>	
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### 6.1 WPS for this project

- SRPLC-WPS-001
- SRPLC-WPS-003
- SRPLC-WPS-004
- SRPLC-WPS-005



Reference : API 1104		
WELDING PROCEDURE SPECIFICATION NUMBER <a href="#">SRPLC-WPS-001</a>		
For <a href="#">Siamraj Public Company Limited</a>	Welding of <a href="#">PTT PLC</a>	Pipe and Fitting
Process <a href="#">GTAW</a>		
Material <a href="#">API 5L-B to X42, ASTM A53-B, ANSI A106-B or equivalent</a>		
Pipe outside diameter and wall thickness <a href="#">O.D. less than 2-inch and Thickness less than 4.8mm</a>		
Joint design <a href="#">Single V-groove</a>		
Filler Metal and number of beads <a href="#">ER70S-6</a>		
Electrical or flame characteristics <a href="#">DC-EN</a>		
Position <a href="#">6G-All</a>		
Direction of Welding <a href="#">Up-hill</a>		
Number of welders <a href="#">1-person</a>		
Time laps between passes <a href="#">180 second Max.</a>		
Type and removal of lineup clamp <a href="#">External Clamp, remove after 25% of root pass complete</a>		
Cleaning and/or grinding <a href="#">Slag remove by hammering, power tool grinding</a>		
Preheat/postweld heat treatment <a href="#">N/A</a>		
Shielding gas and flow rate <a href="#">Argon, 20 LPM</a>		
Shielding flux <a href="#">N/A</a>		
Speed of travel <a href="#">3-6 ipm</a>	Plasma gas flow rate <a href="#">N/A</a>	
Plasma gas composition <a href="#">N/A</a>		
Plasma gas orifice size <a href="#">N/A</a>		
Sketches and tabulations attached <a href="#">As below</a>		
Refer PTT WPS no. <a href="#">1.1 API/D-2.375/T-0.188/Y-42</a>		
Refer PTT PQR no. <a href="#">KWTS09-PTT-PQR1-1.5</a>		
Tested by <a href="#">TBN</a>		
Welder by <a href="#">TBN</a>		
Approved by <a href="#">TBN</a>		

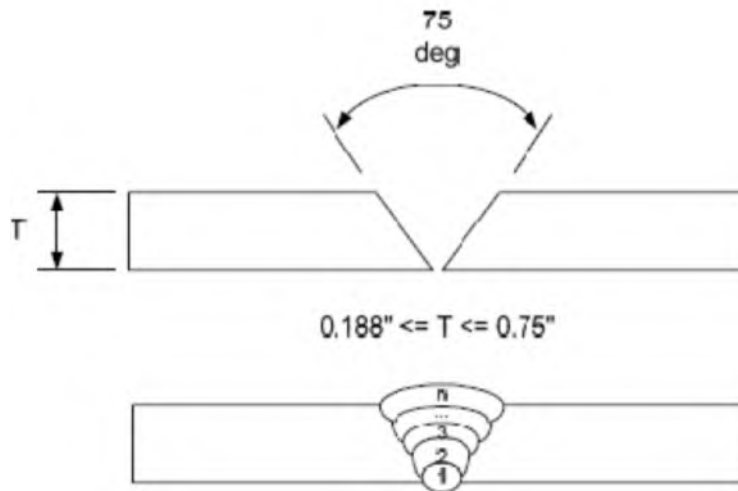


Electrode sizes and number of beads

Bead Number	Electrode size and type	Voltage	Amparage and Polarity	Speed
1	ER70S-6 (2.4mm)	18-24	100-150 / DC-EN	3-6 ipm
2 and 3	ER70S-6 (2.4mm)	18-24	120-200 / DC-EN	3-6 ipm



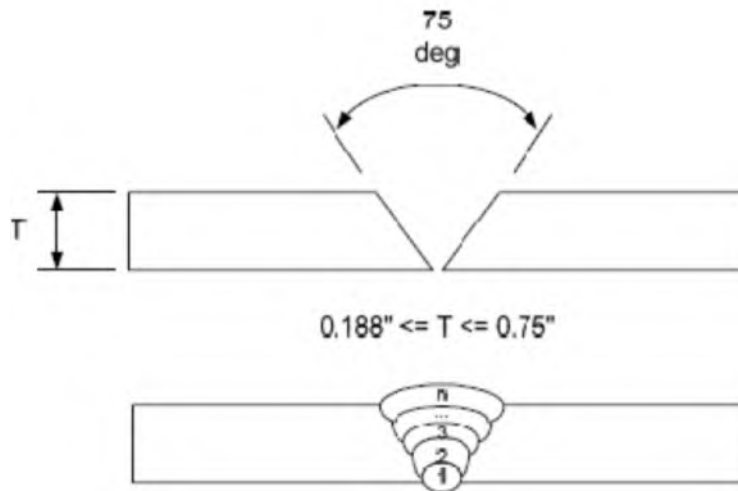
Reference : API 1104		
WELDING PROCEDURE SPECIFICATION NUMBER <a href="#">SRPLC-WPS-003</a>		
For <a href="#">Siamraj Public Company Limited</a>	Welding of <a href="#">PTT PLC</a>	Pipe and Fitting
Process <a href="#">GTAW &amp; SMAW</a>		
Material <a href="#">API 5L-B to X42, ASTM A53-B, ANSI A106-B or equivalent</a>		
Pipe outside diameter and wall thickness <a href="#">2-inch &lt; O.D. &lt; 12-inch and 4.8mm &lt;= Thickness &lt;= 19.1mm</a>		
Joint design <a href="#">Single V-groove</a>		
Filler Metal and number of beads <a href="#">ER70S-6 and E7016</a>		
Electrical or flame characteristics <a href="#">DC-EN for GTAW and DC-EP for SMAW</a>		
Position <a href="#">6G-All</a>		
Direction of Welding <a href="#">Up-hill</a>		
Number of welders <a href="#">1-person</a>		
Time laps between passes <a href="#">180 second Max.</a>		
Type and removal of lineup clamp <a href="#">External Clamp, remove after 25% of root pass complete</a>		
Cleaning and/or grinding <a href="#">Slag remove by hammering, power tool grinding</a>		
Preheat/postweld heat treatment <a href="#">N/A</a>		
Shielding gas and flow rate <a href="#">Argon, 20 LPM</a>		
Shielding flux <a href="#">N/A</a>		
Speed of travel <a href="#">3-6 ipm</a>	Plasma gas flow rate <a href="#">N/A</a>	
Plasma gas composition <a href="#">N/A</a>		
Plasma gas orifice size <a href="#">N/A</a>		
Sketches and tabulations attached <a href="#">As below</a>		
Refer PTT WPS no. <a href="#">1.3 API/2.375-D-12.75/0.188-T-0.75/Y-42</a>		
Refer PTT PQR no. <a href="#">KWTS09-PTT-PQR1-12</a>		
Tested by <a href="#">TBN</a>		
Welder by <a href="#">TBN</a>		
Approved by <a href="#">TBN</a>		



Electrode sizes and number of beads

Bead Number	Electrode size and type	Voltage	Amparage and Polarity	Speed
1 (GTAW)	ER70S-6 (2.4mm)	18-24	100-150 / DC-EN	3-6 ipm
2 (GTAW)	ER70S-6 (2.4mm)	18-24	120-200 / DC-EN	3-6 ipm
3 (SMAW)	E7016 (4.0mm)	20-24	90-140 / DC-EP	2-5 ipm
4 to ...n (SMAW)	ER70S-6 (3.2mm)	20-24	90-120 / DC-EP	3-6 ipm

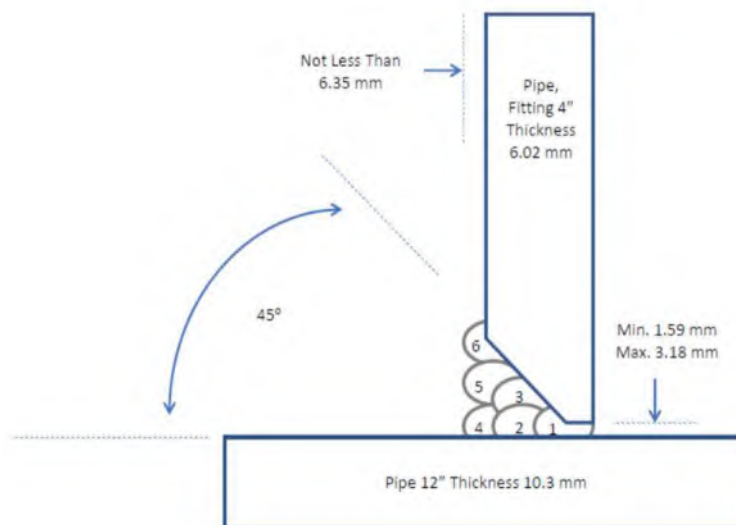
Reference : API 1104		
WELDING PROCEDURE SPECIFICATION NUMBER <a href="#">SRPLC-WPS-004</a>		
For <a href="#">Siamraj Public Company Limited</a>	Welding of <a href="#">PTT PLC</a>	Pipe and Fitting
Process <a href="#">GTAW &amp; SMAW</a>		
Material <a href="#">API 5L-B to X42, ASTM A53-B, ANSI A106-B or equivalent</a>		
Pipe outside diameter and wall thickness <a href="#">12-inch &lt; O.D. and 4.8mm &lt;= Thickness &lt;= 19.1mm</a>		
Joint design <a href="#">Single V-groove</a>		
Filler Metal and number of beads <a href="#">ER70S-6 and E7016</a>		
Electrical or flame characteristics <a href="#">DC-EN for GTAW and DC-EP for SMAW</a>		
Position <a href="#">6G-All</a>		
Direction of Welding <a href="#">Up-hill</a>		
Number of welders <a href="#">1-person</a>		
Time laps between passes <a href="#">180 second Max.</a>		
Type and removal of lineup clamp <a href="#">External Clamp, remove after 25% of root pass complete</a>		
Cleaning and/or grinding <a href="#">Slag remove by hammering, power tool grinding</a>		
Preheat/postweld heat treatment <a href="#">N/A</a>		
Shielding gas and flow rate <a href="#">Argon, 20 LPM</a>		
Shielding flux <a href="#">N/A</a>		
Speed of travel <a href="#">3-6 ipm</a>	Plasma gas flow rate <a href="#">N/A</a>	
Plasma gas composition <a href="#">N/A</a>		
Plasma gas orifice size <a href="#">N/A</a>		
Sketches and tabulations attached <a href="#">As below</a>		
Refer PTT WPS no. <a href="#">1.4 API/12.75-D/0.188-T-0.75/Y-42</a>		
Refer PTT PQR no. <a href="#">PQR-ITD/NRPP-013(DC)</a>		
Tested by <a href="#">TBN</a>		
Welder by <a href="#">TBN</a>		
Approved by <a href="#">TBN</a>		



Electrode sizes and number of beads

Bead Number	Electrode size and type	Voltage	Amparage and Polarity	Speed
1 (GTAW)	ER70S-6 (2.4mm)	18-24	100-150 / DC-EN	3-6 ipm
2 (GTAW)	ER70S-6 (2.4mm)	18-24	120-200 / DC-EN	3-6 ipm
3 (SMAW)	E7016 (4.0mm)	20-24	90-140 / DC-EP	2-5 ipm
4 to ...n (SMAW)	ER70S-6 (3.2mm)	20-24	90-120 / DC-EP	3-6 ipm


Reference : API 1104		
WELDING PROCEDURE SPECIFICATION NUMBER <a href="#">SRPLC-WPS-005</a>		
For <a href="#">Siamraj Public Company Limited</a>	Welding of <a href="#">PTT PLC</a>	Pipe and Fitting
Process <a href="#">GTAW</a>		
Material <a href="#">API 5L-B to X42, ASTM A53-B, ANSI A106-B or equivalent</a>		
Pipe outside diameter and wall thickness <a href="#">12-inch &gt;= O.D. and 4.8mm &lt;= Thickness &lt;= 19.1mm of Mainline</a>		
<a href="#">4-inch &gt;= O.D. of Branch and 4.8mm &lt;= Thickness &lt;= 19.1mm of Mainline</a>		
Joint design <a href="#">T-Joint or Branch Weld</a>		
Filler Metal and number of beads <a href="#">ER70S-6</a>		
Electrical or flame characteristics <a href="#">DC-EN for GTAW</a>		
Position <a href="#">6G-All</a>		
Direction of Welding <a href="#">Up-hill</a>		
Number of welders <a href="#">1-person</a>		
Time laps between passes <a href="#">180 second Max.</a>		
Type and removal of lineup clamp <a href="#">Tack welding is allow for 25% route pass only</a>		
Cleaning and/or grinding <a href="#">Slag remove by hammering, power tool grinding</a>		
Preheat/postweld heat treatment <a href="#">N/A</a>		
Shielding gas and flow rate <a href="#">Argon, 20 LPM</a>		
Shielding flux <a href="#">N/A</a>		
Speed of travel <a href="#">3-6 ipm</a>	Plasma gas flow rate <a href="#">N/A</a>	
Plasma gas composition <a href="#">N/A</a>		
Plasma gas orifice size <a href="#">N/A</a>		
Sketches and tabulations attached <a href="#">As below</a>		
Refer WPS no. <a href="#">WPS-P12-BP4-6.02-X42-001</a>		
Refer PQR no. <a href="#">PQR-P12-BP4-6.02-X42-001</a>		
Tested by <a href="#">TBN</a>		
Welder by <a href="#">TBN</a>		
Approved by <a href="#">TBN</a>		



Electrode sizes and number of beads

Bead Number	Electrode size and type	Voltage	Amparage and Polarity	Speed
1 (GTAW)	ER70S-6 (2.4mm)	18-24	100-150 / DC-EN	3-6 ipm
2 & 3 (GTAW)	ER70S-6 (2.4mm)	18-24	120-200 / DC-EN	3-6 ipm
4 to n (SMAW)	ER70S-6 (2.4mm)	18-24	120-200 / DC-EN	2-5 ipm



	WELDING PROCEDURE SPECIFICATION FOR PIPING (WPS)	<b>RE-ROUTE PTT PIPELINE HSR 4-2</b>	
		Document No.	PR-W-2102.18-010-001
		Rev. C	Page 11 of 15

## 6.2 Reference WPS from PTT

- 1.1 API/D-2.375/T-0.188/Y-42
- 1.3 API/2.375-D-12.75/0.188-T-0.75/Y-42
- 1.4 API/12.75-D/0.188-T-0.75/Y-42
- WPS-P12-BP4-6.02-X42-001



	PTT PUBLIC COMPANY LIMITED	SP-W-000-01 Rev. 0
	Welding Procedure Specification (WPS)	20 August 2009

**ลำดับที่ 1** WPS No. API/D-2.375/T-0.188/Y-42

PROCEDURE SPECIFICATION NO.

API/D-2.375/T-0.188/Y-42

For ALLIANCE PLANT SERVICES Welding of PTT PLC. Pipe and fittings

Process GTAW

Material API 5L, SMYS<=42,000

Pipe outside diameter and wall thickness DIA <2.375", THICKNESS<0.188"

Joint design BUTT JOINT 75 degree "SINGLE VEE"

Filler metal and no. of beads ER70S-6

Electrical or flame characteristics DC-

Position FIX 5G

Direction of welding VERT. UP

No. of welder 1

Tim lapse between passes 180s max

Type and removal of lineup clamp EXTERNAL LINEUP CLAMP, REMOVE AFTER 25% ROOT COMPLETE

Cleaning and/or grinding SLAG REMOVE BY HAMMERING, BRUSHING THEN GRINDING IF NECESSARY

Preheat/stress relief n/a

Shielding gas and flow rate Ar, 20 lpm

Shielding flux n/a

Speed of travel 3-6 in/min

Plasma gas flow rate n/a

Plasma gas composition n/a

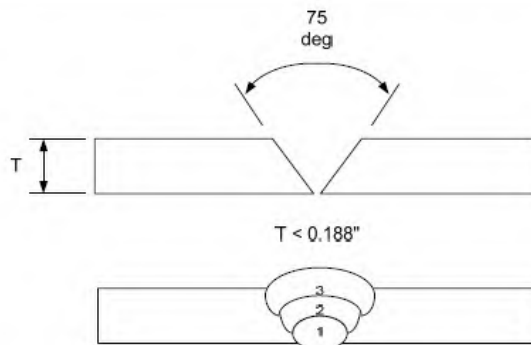
Plasma gas orifice size n/a

Sketches and tabulations attached as below

Tested N. PHURAYA Welder A. PRONG-A-KART

Approved N. KUNAWONG Welding supervisor P. THONGSIRI

Adopted B.POOPAT Chief engineer S. PEANSUKMANEE



ELECTRODE SIZE AND NUMBER OF BEADS

Layer Number	Electrode Size and Type	Voltage	Amperage and Polarity	Speed
1	ER70S-6 (2.4mm)	18-24	100-150 (DCEN)	3-6 ipm
2 and 3	ER70S-6 (2.4mm)	18-24	120-200 (DCEN)	3-6 ipm

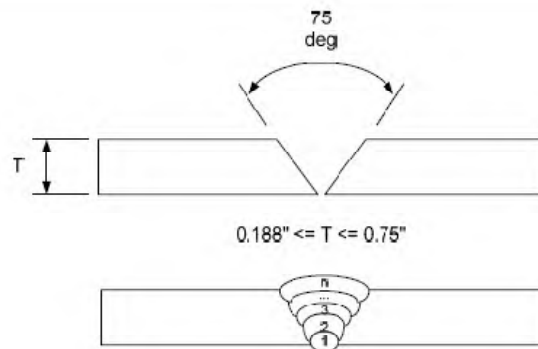


## ลำดับที่ 3 WPS No. API/2.375-D-12.75/0.188-T-0.75/Y-42

## PROCEDURE SPECIFICATION NO.

API/2.375-D-12.75/0.188-T-0.75/Y-42

For	ALLIANCE PLANT SERVICES	Welding of	PTT PLC.	Pipe and fittings
Process		GTAW	and SMAW	
Material		API 5L, SMYS ≤ 42,000		
Pipe outside diameter and wall thickness		2 3/4" ≤ DIA ≤ 12 7/8" 0.188" ≤ THICKNESS ≤ 0.75"		
Joint design		BUTT JOINT 75 degree "SINGLE VEE"		
Filler metal and no. of beads		ER70S-6 (2 Beads)	E7016 (n Beads)	
Electrical or flame characteristics		DC-	DC+	
Position		FIX 5G	FIX 5G	
Direction of welding		VERT. UP	VERT. UP	
No. of welder		1 or 2	1 or 2	
Time lapse between passes		180s max	180s max	
Type and removal of lineup clamp		EXTERNAL LINEUP CLAMP, REMOVE AFTER 25% ROOT COMPLETE		
Cleaning and/or grinding		SLAG REMOVE BY HAMMERING, BRUSHING THEN GRINDING IF NECESSARY		
Preheat/stress relief		n/a		
Shielding gas and flow rate		Ar, 20 lpm	n/a	
Shielding flux		n/a	as electrode	
Speed of travel		3-6 in/min	2-6 in/min	
Plasma gas flow rate		n/a		
Plasma gas composition		n/a		
Plasma gas orifice size		n/a		
Sketches and tabulations attached		as below		
Tested	N. PHURAYA	Welder	A. PRONG-A-KART	
Approved	N. KUNAWONG	Welding supervisor	P. THONGSIRI	
Adopted	B. POOPAT	Chief engineer	S. PEANSUKMANEE	



## ELECTRODE SIZE AND NUMBER OF BEADS

Layer Number	Electrode Size and Type	Voltage	Amperage and Polarity	Speed
1 (GTAW)	ER70S 6 (2.4mm)	18-24	100-150 (DCEN)	3-6 ipm
2 (GTAW)	ER70S-6 (2.4mm)	18-24	120-200 (DCEN)	3-6 ipm
3 (SMAW)	E7016 (4.0mm)	20-24	90-140 (DCEP)	2-5 ipm
4 to... n (SMAW)	E7016 (3.2mm)	20-24	90-120 (DCEP)	3-6 ipm





# PTT PUBLIC COMPANY LIMITED

SP-W-000-01 Rev. 0

## Welding Procedure Specification (WPS)

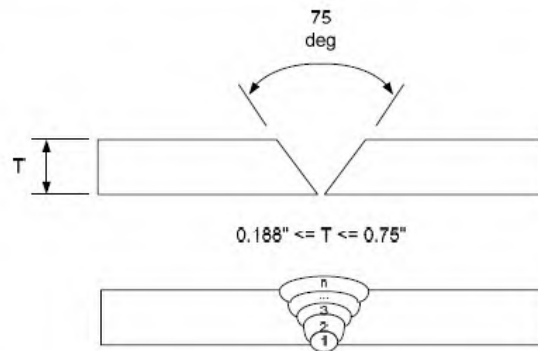
20 August 2009

### ลำดับที่ 4 WPS No. API/12.75-D/0.188-T-0.75/Y-42

#### PROCEDURE SPECIFICATION NO.

API/12.75-D/0.188-T-0.75/Y-42

For	ALLIANCE PLANT SERVICES	Welding of	PTT PLC.	Pipe and fittings
Process		GTAW	and SMAW	
Material		API 5L, SMYS ≤ 42,000		
Pipe outside diameter and wall thickness		12.75" < DIA, 0.188" ≤ THICKNESS ≤ 0.75"		
Joint design		BUTT JOINT 75 degree "SINGLE VEE"		
Filler metal and no. of beads		ER70S-6 (2 Beads)	E7016 (n Beads)	
Electrical or flame characteristics		DC-	DC+	
Position		FIX 5G	FIX 5G	
Direction of welding		VERT. UP	VERT. UP	
No. of welder		1 or 2	1 or 2	
Time lapse between passes		180s max	180s max	
Type and removal of lineup clamp		EXTERNAL LINEUP CLAMP, REMOVE AFTER 25% ROOT COMPLETE		
Cleaning and/or grinding		SLAG REMOVE BY HAMMERING, BRUSHING THEN GRINDING IF NECESSARY		
Preheat/stress relief		n/a		
Shielding gas and flow rate		Ar, 20 lpm	n/a	
Shielding flux		n/a	as electrode	
Speed of travel		3-6 in/min	2-6 in/min	
Plasma gas flow rate		n/a		
Plasma gas composition		n/a		
Plasma gas orifice size		n/a		
Sketches and tabulations attached		as below		
Tested	N. PHURAYA	Welder	A. PRONG-A-KART	
Approved	N. KUNAWONG	Welding supervisor	P. THONGSIRI	
Adopted	B. POOPAT	Chief engineer	S. PEANSUKMANEE	



#### ELECTRODE SIZE AND NUMBER OF BEADS

Layer Number	Electrode Size and Type	Voltage	Amperage and Polarity	Speed
1 (GTAW)	ER70S-6 (2.4mm)	18-24	100-150 (DCEN)	3-6 ipm
2 (GTAW)	ER70S-6 (2.4mm)	18-24	120-200 (DCEN)	3-6 ipm
3 (SMAW)	E7016 (4.0mm)	20-24	90-140 (DCEP)	2-5 ipm
4 to... n (SMAW)	E7016 (3.2mm)	20-24	90-120 (DCEP)	3-6 ipm



VESOLUTION CO., LTD.



VICCHI ENGINEERING CO., LTD.

Doc. No. : WPS-P12-BP4-6.02-X42-001

Issued Date : September 7, 2020 Rev. : 0

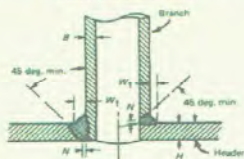
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Page No. : 2 of 2

**Sequence of Beads and Inspection**

ASME B31.8-2016

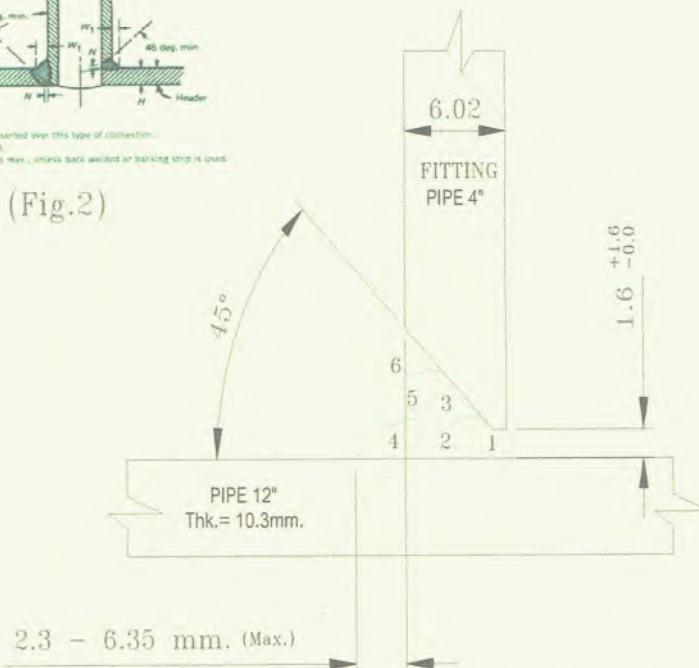
Fig. 1-1 Welding Details for Openings Without Reinforcement Other Than That in Header and Branch Walls



## GENERAL NOTES

- (a) When a welding saddle is used, it shall be inserted over this type of connection.  
 (b)  $W_1 = \frac{1}{4}$  in. but not less than  $\frac{1}{8}$  in. (6.35 mm).  
 (c)  $W_2 = \frac{1}{4}$  in. (6.35 mm) min.,  $\frac{1}{2}$  in. (12.7 mm) max., unless back welded or backing strip is used.

(Fig.2)

**Electrode size and Number of Beads**

Layer No.	Beads No.	Process Welding	Rod size and Type (note 3)	Polarity	Voltage	Amperage	Speed of Travel	Heat input <sup>(note 1,2)</sup>
					(V.)			
1	1	GTAW.	2.4 ER70S-6	DC - EN	13 - 15	120-140	7 - 11	0.850 - 1.800
2	2 - 3	GTAW.	2.4 ER70S-6	DC - EN	13 - 15	120-140	7 - 11	0.850 - 1.800
3	4 - 6	GTAW.	2.4 ER70S-6	DC - EN	13 - 15	120-140	7 - 11	0.850 - 1.800

note : 1 Heat input (kJ./inch.) = (Amps. X Volts. X 60) / [ Travel Speed (inch./min.) X 1000 ]  
 or Heat input (kJ./mm.) = (Amps. X Volts. X 60) / [ Travel Speed (mm./min.) X 1000 ]

2 Heat input (Max.) = Amps.(Max.) X Volts.(Max.) / Travel Speed (Min.)  
 Heat input (Min.) = Amps.(Min.) X Volts.(Min.) / Travel Speed (Max.)

3 Welds rod AWS.ER70S-6 (GTAW.) and AWS. E7016 (SMAW.) uses "Kobelco" brand name

Prepared By :

Reviewed By :

Approved By :

Signature

Signature

Signature

Name

Name

Name

Date

Date

Date



บริษัท ปตท. จำกัด (มหาชน)

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ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

#### ภาคผนวก 2-11

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โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



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บริษัท เอ็นทิก จำกัด





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ฉบับที่ 3 ระหว่างเดือนมกราคมถึงเดือนมิถุนายน พ.ศ. 2566

การประชุมและการอบรมผู้รับผิดชอบก่อนดำเนินงานต่อเชื่อม

กรกฎาคม 2566



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บริษัท เอ็นทิก จำกัด

อ่านแล้ว  
15:08





อ่านแล้ว  
15:02







บริษัท ปตท. จำกัด (มหาชน)

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

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(รายงานการขอเปลี่ยนแปลงรายละเอียดโครงการในรายงานการวิเคราะห์ผลกระทบสิ่งแวดล้อม

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ตัวอย่างเอกสารระเบียบปฏิบัติการจัดระบบงานต่อเชื่อม  
ท่อส่งก๊าซฯ เดิม

กรกฎาคม 2566



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โทรศัพท์ 0 2379 0141-2 โทรสาร 0 2379 0143-4



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ผู้จัดทำรายงาน  
บริษัท เอ็นทิก จำกัด



PTT PUBLIC COMPANY LIMITED

โครงการพัฒนาระบบท่อ เพื่อลดผลกระทบจากโครงการร่วมมีระยะทางรับทราบแจ้งจากภาคธุรกิจและ  
ผู้ดูแลเชิงบริหารระดับประเทศในการพัฒนาระบบท่อที่มีความเสี่ยงต่อความปลอดภัย  
ช่วงที่ 1 กรุงเทพฯ - นครราชสีมา (ระยะที่ 1 ช่วงกรุงเทพฯ - นครราชสีมา) สัญญา 4-2  
(RE-ROUTE PTT PIPELINE HSR 4-2)

DOCUMENT TITLE:	HOT TAP TIE-IN AND HOT TAP STOPPLE PLUG PROCEDURE (SCOPE#1)
DOCUMENT NO.:	PR-D-2102.18-4470-003      REVISION: A

REVIEW STAMP	COMMENTS
<input checked="" type="checkbox"/> E : Approved for Construction.	
<input type="checkbox"/> F : Work may proceed. Submit for Construction	
<input type="checkbox"/> G : Revise and Resubmit. Work may proceed subject to incorporation of changes indicated.	
<input type="checkbox"/> H : Revise and Resubmit. Work may not proceed.	
<input type="checkbox"/> I : Review not required. Work may proceed.	
Name : _____	
Sign : _____	
Date : _____	

0	18-Apr-22	Issued for Construction		PwP	YI	PT			
A	06-Apr-22	Issued for Approval		PwP	YI	PT			
Rev.	Date	Description		Prepared By	Checked By	Approved By			
CONTRACTOR: SIAMRAJ PUBLIC COMPANY LIMITED									




	HOT TAP TIE-IN AND HOT TAP STOPPLE PLUG PROCEDURE (SCOPE#1)	RE-ROUTE PTT PIPELINE HSR 4-2	
		Document No.	PR-D-2102.18-4470-003
		Rev. 0	Page 3 of 39

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# 1 INTRODUCTION

## 1.1 General information

This document covers the safe working practices for the execution of Hot Tapping and Line Stopple Plugging operation Including In-service welding works.

It is the responsibility of POWERPIPE project execution team and shall be adhered to all personnel involved with the operation.

The purpose of the project is to "RE-ROUTE PTT PIPELINE HSR 4-2".


## 1.2 Abbreviations and Definitions

Terms	Definition
Psi(a), Psi(g)	Pressure in Psi, absolute and gauge
Owner/Client	PTT
Main Contractor	Siamraj PCL.
Hot tap Contractor	POWERPIPE CO., LTD.
HSE	Health, Safety, and Environment
JSA	Job Safety Analysis
m.	meter
m3	Cubic meter
MSDS	Material Safety Data Sheet
N/A	Not applicable
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PSV/PRV	Pressure Safety Valve/Pressure Relief Valve.
PTW	Permit to Work System
Rev	Revision
Scf.	Standard Cubic Foot
FIM	Free Issue Material

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Project	Re-route PTT pipeline HSR 4-2
Flammable Service	A fluid which, under expected operating conditions, is a vapour or produces vapours that can be ignited and continue to burn in air
Hazardous Substance	Produced, but not limited to, those substances that are explosive, combustible, toxic or corrosive
Hot Tapping	The technique of attaching a mechanical or welded branch fitting to piping or equipment in service, and creating an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting.
Gate Valve	A gate valve, also known as a sluice valve, is a valve that opens by lifting a barrier (gate) out of the path of the fluid. Gate valves require very little space along the pipe axis and hardly restrict the flow of fluid when the gate is fully opened. The gate faces can be parallel but are most commonly wedge-shaped (in order to be able to apply pressure on the sealing surface)
Manufacturer/Vendor	The party which manufactures and/or supplies equipment, technical documents/drawings and services to perform the duties specified by the POWERPIPE
On-Plot Piping	Pipe system designed in accordance with ASME B31.1, ASME B31.3 (see Note below)
NOTE: Some parts of a pipeline system, although located "off-plot", may be designed in accordance with ASME B31.3. For the purposes of this specification, such piping shall be considered to be On-plot. Similarly, some refinery piping, although physically located "on-plot", may be designed in accordance with ASME B31.4 or B31.8. For the purposes of this specification, such piping shall be considered to be Off-plot	
Operating Conditions	All conditions of piping and equipment when containing hydrocarbons under a positive internal pressure
Run-Pipe	The existing pipe into which a Hot-Tap is to be made
Shall	Indicates a mandatory requirement
Should	Indicates a strong recommendation
Site	Any place where the facilities will be reinstated, constructed and/or installed



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### 1.3 Pipeline Data Sheet


Main Pipeline Size	24 Inch
Wall Thickness	0.688"
Pipeline Material	Carbon Steel
Orientation Of Pipe	Horizontal
Service Fluid	Natural Gas
Design Pressure	720 Psi
Operating Pressure ( Max/Min)	460 Psi
Design Temperature	176 Deg. Far.
Operating Temperature	77 Deg. Far.
Branch Size for Hot Tapping	20 Inch
Branch Size for Line Stopple Plugging	24 Inch
Orientation of Tap	12 – O' clock position
Valve Type	24" X 300 # Sandwich Valve , 20" X 300# Full Bore ball Valve.
Fitting Type	Fully Encidement Split Tee

### 1.4 Communications

Throughout the Project communications should be maintained between POWERPIPE Operations Manager and PTT, EIC. If communications fail at any given time, the operation shall cease until communications are re-established.

### 1.5 References

1. API RP 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries
2. API 1104 Welding of Pipelines and Related Facilities
3. ASME B31.8 Process Piping
4. ASME B16.5 Steel Pipe Flanges & Flanged Fittings
5. ASTM A106 Standard Specifications for Seamless Carbon Steel Pipelines
6. API 5L Specification for line pipe.
7. ASME B 16.25 : But Welding Ends.
8. MSS-SP44 Steel pipeline flanges
9. ASME Sec.VIII : Boiler & Pressure Vessels Code-Rules for the construction of pressure.
10. ASME Sec. V: Non-destructive examination.
11. ASME Sec. IX: Welding.
12. ASME Sec. VIII Div.1 & 2: Fabrication.
13. ASTM A694: carbon and alloy steel forgings for pipe flanges, fittings, valves, and parts for high pressure transmission service.


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## 2 SCOPE OF WORK

This document gives the detailed requirement to be covered the task as listed below:

1. Existing pipe wall thickness check (See PAE-UTM-008)
2. U.T. Lamination checking of pipeline (See PAE-UT-004)
3. Pipe seam verification (See PAE-RT-001)
4. Roundness checking
5. Fitting installation
6. Welding
7. Inspection and testing
8. Hot tap operation
9. Line stop Operation
10. Pipeline modification
11. Completion plug installation



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### 3 HEALTH, SAFETY & ENVIRONMENT

A copy of the POWERPIPE Health, Safety and Environmental Management Systems Manual will be kept on site and is available for review by PTT.

The standards and safe working practices outlined in this document will be adopted and referred to throughout POWERPIPE operations on site.

All work will be carried out in accordance with the PTT and the POWERPIPE QHSE Plan.

Every day recording of the manpower available at site before start of the work to be carried out.

#### 3.1 HSE Considerations

Safety is the responsibility of every employee irrespective of status. Employees will ensure that their workplace is safe and functions efficiently and safely. Common sense should be applied for 'safe working' practices to be implemented and adhered to at all times. Particular attention will be given to work site safety and to any safety systems and procedures provided. POWERPIPE to complete any Client site specific safety training and site orientation prior to commencing site activities.

Personal Protective Equipment (PPE) will be issued to all personnel. The minimum PPE of hard hat, safety boots, full length coveralls, gloves and eye protection will be worn at all times when working on site.

Barriers will be erected in order to ensure that unauthorised personnel do not enter the worksite, and tannoy announcements will be broadcast to warn personnel of any operations that require the worksite to be barriered off.

All Hot tap and line stop equipments along with its accessories will be checked to confirm that they are of a suitable pressure rating for the task. All air hoses will be secured with whip-checks & R-pins.

On completion of the work scope, and prior to demobilisation, any equipment which is damaged or faulty will be clearly red tagged and an equipment damage report will be completed.

Any equipment which may contain residual chemicals will be clearly tagged, and the base will be made aware of these items prior to the items being demobilised.

#### 3.2 Safety Systems


The worksite Permit-to-Work system will be implemented and strictly adhered to at all times. No work will be carried out unless the required Permit has been raised, authorised and signed on. If the scope of work changes during the duration of the Permit, the POWERPIPE Project Engineer will ensure that any changes to the work are discussed with (Company and Client), and the permit modified (if necessary) and re-issued.

Prior to operations commencing, a Pre-Job Safety Meeting will be held to ensure that all parties involved in, or affected by, the work are aware of its nature and of the hazards involved. The meeting will be held on site and recorded on the Pre-Job Safety Meeting Form. Any outstanding actions following the meeting will be closed out prior to operations commencing.

Any employee shall have the right to stop operations for discussion if he/she feels that there is a breach of safety procedures, or if an unsafe act is taking place.

#### 3.3 Site Induction and Permit to Work

All POWERPIPE operational personnel must have attended the PTT site safety induction course prior to commencement of operations. The POWERPIPE Project Engineer will brief personnel on the operational requirements, site hazards and relevant safety issues.

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All works must be carried out in accordance with the client safe working procedure. Job Risk Analysis is to be prepared and approved by client HSE before starting work.

#### 3.4 Pre-Job Safety Meetings and Toolbox Talks

I. The POWERPIPE Project Engineer immediately prior to commencement of operation will hold a Pre-Job Safety Meeting on site. All personnel involved in flushing operations should be in attendance.

II. The meeting will cover all job and site related hazards, safety controls in place, contingency plans in the event of emergencies and any other points deemed relevant. Any questions or queries should be raised at the meeting. Minutes of the meeting will be recorded on a POWERPIPE Pre-Job Safety Meeting Form.

III. The POWERPIPE Project Engineer will conduct Toolbox talks before each new task/operation is undertaken, which will be recorded on the appropriate form. The purpose of the talks is to inform the POWERPIPE Crew of any potential hazards, safe working practices to be adopted and contingency plans in the event of an incident/accident. Client or third party personnel affected by the works are invited to attend.

#### 3.5 Hot Tapping Operation.

I. During Hot Tapping operation the surrounding area around-off point will be access restricted by use of barricade safety tape at a distance 10 meters from the tapping point. In addition to this danger signs shall be located in a sufficient distance around the area to warn the personnel of the activity.

II. Ensure all the surrounding area is cleaned and all loose construction materials is removed, access to the restricted area shall only be permitted by the supervision.

III. Ensure that the surrounding equipment are properly protected from the loose and unwanted materials from the blow off point.

IV. Ensure all the required personnel protective equipment such as ear plugs, gloves, safety glasses etc. are to be provided and worn by all the personnel involved in the operation.

#### 3.6 Near Miss / Incident / Accident Reporting

I. It is the policy that all accidents, incidents or near misses involving POWERPIPE personnel, equipment, property, or affecting third parties, must be reported without exception. This includes the operations and employees of companies subcontracted by POWERPIPE Services.

II. All employees must be aware of these requirements and of their duty to recognize and report any occurrence, which comes within the terms of the POWERPIPE and relevant Client Accident reporting system. POWERPIPE Project Engineer shall satisfy himself that all personnel under his control are aware of this requirement and shall periodically check this fact.


#### 3.7 Emergency Response Plan

Following are the major emergency incidents that might occur at site.

- I. Fire / Explosion.
- II. Injury due to lifting operation, fire, electrocution, civil unrest, Natural disaster, Medical also.
- III. Toxication.
- IV. Objects falling from height, sliding, moving parts, drowning, etc.





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- V. The possibility of such an emergency occurring although is very less, the company has the requisite preparedness in such an eventuality.

#### FIRE/EXPLOSION LEADING TO EVACUATION:


- I. Fire or explosion that has occurred at site and which is out of control and no longer localized to that section only shall be called as an 'EMERGENCY'. It is left to the discretion of the personnel at site of incident whether to call for an emergency or not.
- II. Emergency will be activated by any of these means – over the phone or by word of mouth or by shouts or using emergency siren. On activation of the emergency at the site, all those present at the work location including Technicians, supervisors, coordinator, helpers shall assemble at the Assembly Point and immediately report to their respective seniors as planned.
- III. The Assembly Point of the Industry or site is the open space present in front of the security room/ where it is safe.
- IV. The Engineer in charge shall report the head-count and the presence of their respective personnel and that of the Technician, supervisor who were under their control. The Manager or his designate who is the head-count man shall be the Site Incident Controller. He shall first ensure that the working area has been completely evacuated.
- V. Site Incident Controller will assume full control of the administrative aspect of the emergency. He shall dictate the immediate action to be taken at the Scene of incident. He shall guide the assembled people on further course of action.

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Hider		

Note:

- I. during an emergency always ensure that you do not panic or give any scope for confusion or chaos.
- II. do not spread rumors or gossips.
- III. all shall adhere to the instructions delivered by the site incident controller.
- IV. make way for the emergency fighting resources to reach the source of incident.

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#### TOXICATION:

Many chemicals found in the pipeline/work place have a harmful effect on humans. These chemicals may enter the body through skin absorption, through respiratory or elementary systems. Harmful effects may become apparent immediately or in the short / long term. In case of emergencies where gases enter the atmosphere is a critical area, as volumes of dangerous impurities are difficult to measure. It is therefore essential to that detection of any traces of dangerous gases above the Threshold Limit Value (T.L.V) and take the necessary safety precautions.

Special attention is drawn to the possible presence of extremely poisonous substances.

#### INJURY WHILE WORKING. FALL FROM HEIGHT/OBJECTS. FALLING FROM HEIGHT

While working at a height or while working/ walking near the site of works the possibility of fall from height or objects falling down is present and injury while working.

When you find someone being injured while working or by fall or by an object falling from a height.

- I. Immediately isolate the person from the source of injury ensuring that further danger or severity is arrested.
- II. Call for qualified assistance.
- III. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### EMERGENCY NUMBERS AND TRAINED FIRST AIDERS

##### EMERGENCY PHONE NUMBERS:(IN HOUSE)

Anywhere in India (Toll free)

FIRE – 101

AMBULANCE – 102/108

POLICE – 100

PROJECT INCHARGE –

HSE OFFICER –

HOSPITAL -

AT PLANT

FIRE STATION – FIRE


MEDICAL-

SECURITY-

#### TRAINED FIRST AIDERS AND FIRE FIGHTERS

NAME	DESIGNATION



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#### CIVIL UNREST

- I. Civil unrest, is an activity arising from a mass act of civil disobedience (such as a demonstration, riot, or strike) in which the participants become hostile toward authority, and authorities incur difficulties in maintaining public safety and order, over the disorderly crowd. It is, in any form, prejudicial to public law and order.
- II. Familiarize yourself with the route, site set-up, and range of exits, help & security points.
- III. know alternative routes on different modes of transport
- IV. calculate plenty of time, set out early
- V. agree on a plan should you get separated while in a crowd
- VI. plan for an agree on potential emergency scenarios should you get hurt
- VII. Carry some minimal items on your person: pocket first aid including burns, marker pen, tape, water etc.
- VIII. Be identifiable, have emergency contacts cards on person.
- IX. comply as instructed by public safety and health agencies and their reps
- X. assist others if you can to help reduce potential congestion, disorder or panic but always consider your own safety - keep alert and focused, rest often, keep hydrated
- XI. Save your phone battery life: text rather than call, turn screen brightness low, keep essential calls short but keep your family friends & colleagues updated. Let them know you are safe
- XII. Redundancy: helmets and other recreational gear can double as personal protection in extreme conditions.

#### MEDICAL EMERGENCY

- I. A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies such as cardiovascular (heart), respiratory, and gastrointestinal cannot be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from first aiders through Emergency Medical technicians, paramedics, emergency physicians and anesthesiologists.
- II. Stop Work: Abandon any plant, equipment or area immediately if a medical emergency occurs
- III. Assess the Risk: Check for Danger. Secure the area and Raise the Alarm what is the cause of the medical issue? Is it related to the work currently being performed? Has the patient been exposed to a dangerous environment (e.g. electricity, vehicle incident, fall from height) or is it due to personal health issues (e.g. heart attack, stroke) your priority should be to keep yourself and others safe. Decide if you are competent to manage the incident.
- IV. Notify: Report the incident to the site in charge immediately. They may take responsibility for managing the incident. If they are not available, contact Health, Safety, and Environment & Quality (SHEQ) Officer. If necessary, any people not involved in managing the incident should proceed to the emergency assembly area at the entrance of the site. As required, The Facility Manager or SHEQ will contact the relevant authorities immediately: Fire, Ambulance or Police. External authorities may take control of emergency response at the site.
- V. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.



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#### NATURAL DISASTER

A natural disaster is a major adverse event resulting from natural processes of the Earth like: floods, hurricanes, tsunamis, volcanocentrications, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover and also on the infrastructure available.

#### Tornado:

- I. Small interior rooms on the lowest floor and without windows.
- II. Hallways on the lowest floor away from doors and windows.
- III. Rooms constructed with reinforced concrete, brick, or block with no windows.
- IV. Stay away from outside walls and windows.
- V. Use arms to protect head and neck.
- VI. Remain sheltered until the tornado threat is announced to be over.

#### Earthquake:

- I. Stay calm and await instructions from the Emergency Coordinator or the designated official.
- II. Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- III. Evacuate as instructed by the Emergency Coordinator and/or the designated official.

#### Flood: If indoors:

Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official. Follow the recommended primary or secondary evacuation routes.


#### Flood: If outdoors:

- I. Climb to high ground and stay there.
- II. Avoid walking or driving through flood water.
- III. If car stalls, abandon it immediately and climb to a higher ground.

#### Hurricane:

- I. The nature of a hurricane provides for more warning than other natural and weather disasters.
- II. A hurricane watch issued when a hurricane becomes a threat to a coastal area.
- III. Once a hurricane watch has been issued: Stay calm and await instructions from the Emergency Coordinator or the designated official.
- IV. Moor any boats securely, or move to a safe place if time allows.
- V. Continue to monitor local TV and radio stations for instructions.
- VI. Move early out of low-lying areas or from the coast, at the request of officials.
- VII. If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- VIII. Collect drinking water in appropriate containers.
- IX. Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- X. Leave areas that might be affected by storm tide or stream flooding.



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#### COMMUNICATION

- I. All communication to be through site in charge and External communication will be done by Cortech to media or anywhere.
- II. The main channel of communication between the command center and incident command post is via telephone/ shouting.
- III. All-important contact telephone numbers, e.g. Government agencies, external bodies are displayed near the assembly point point.
- IV. The security guard is responsible for taking the head count, in coordination with the hseq department.

#### EMERGENCY TEAM

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Alder		


#### MOCK DRILLS

Regular mock drill shall be conducted as per approved emergency plan at all the above stations. Deficiencies identified & corrective action taken shall be documented. In addition to the mock drills conducted by PTT. POWERPIPE with PTTcombined mock drills shall be organized once in two months to test the efficacy of response in emergency situations. Performance & findings of combined emergency drills shall be shared & documented between the organizations to sustain emergency preparedness at the highest level.

- I. Inform all the employees about mock drill.
- II. Fix the date for mock drill.
- III. Observers will not be involved in the exercise. They will monitor the Mock drill.
- IV. Emergency Siren / alarm will be raised.
- V. After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in above.
- VI. Observer will note down the activities with respect to the time.

#### 3.8 Shift Handovers(if applicable)

At every shift change there shall be a time period solely dedicated for the purpose of exchanging a written and a verbal account of the previous shift's operations. It is the responsibility of the POWERPIPE Project Engineer and POWERPIPE Shift Project Engineer to ensure that there is a complete exchange of all information sufficient to allow the "oncoming" crew to safely and competently continue with the operations. The shift handover period should include [when appropriate] a complete "walk through" of the systems under test in order to identify strategic areas or points.

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#### 3.9 POWERPIPE QHSE representative

POWERPIPE project engineer shall act as POWERPIPE site QHSE representative. He shall be responsible for the overall supervision and safety of all POWERPIPE personnel on site (acting POWERPIPE site 'Health, Safety and Environmental Representative'), and will ensure all work activities undertaken are in accordance with Client / POWERPIPE approved work procedures, safe working practices and Permit to Work systems (if applicable).

#### 3.10 Risk assessments

A Toolbox Safety Talk will be conducted on site before each new job task or section of a job procedure. All personnel participating in the works will attend, with details of the work, the hazards and the precautions being discussed. Where shift work is in operation, the Toolbox Safety Talk will be given to personnel on both shifts. The talk(s) will be logged in the Daily Operations Report.

Any changes to the scope of work must be risk assessed. Prior to implementation, the changes must be reviewed and accepted by both POWERPIPE and client.

HSE Risk Assessments identify Hazards and the degree of Risk that they pose. Assessments are carried out to indicate the control measures (safety equipment, work procedures, isolation methods, training and communication) required to reduce Risk to an acceptable level. Assessments must be carried out and approved prior to work commencing.

The Risk Assessment Analysis sheet identifies the Hazards and Hazard Effects and is used to assess the Risk as follows:

An initial Risk Factor will be obtained by assessing the severity and probability (frequency) of the harm that might arise from the Hazard.

Existing or proposed Hazard control measures will be entered against each identified potential accident. These measures should reduce the risk to an acceptable level. If the risk remains unchanged other remedial action should be specified on the sheet until it is reduced.

#### 3.11 QC Considerations

The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information as dictated in the procedure. Each task should be ticked completed as the work progresses. During the preparation of the work or its progress, intermediate check lists, as required, will be signed off. The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information.

On completion of the works the Project Engineer must collate the completed documentation. The completed documentation will be included in the test report.

#### 3.12 Management of Change

POWERPIPE operates a Safety Critical system. All 'Safety Critical' activities defined in this document are identified with the following:

STOP




The Safety Critical system is in place to ensure that all personnel are aware of critical stages as defined in this document.

Changes to procedure may be required as a result of changes in the scope of work.





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Deviation from this procedure shall be subject to authorisation by POWERPIPE and PTT and shall be documented on a "Confirmation of Variation Instruction" form (Submitted only if necessary), will be used in any situation where the site works intend to deviate from the approved procedures. The POWERPIPE Engineering site representative is responsible for the development of the management of change and any associated risk assessment. The POWERPIPE Project Engineer will be responsible for compiling, logging and distributing the required forms as applicable and co-ordinating the risk assessment.

The Client representative and the POWERPIPE Project Engineer are responsible for the co-ordination and implementation of the management systems to authorize and manage changes.


### 3.13 Responsibilities

#### Project Personnel

Shall be familiar with all POWERPIPE Corporate and Project Quality Health, Safety and Environmental issues. They shall be responsible for identifying and reporting any non-conformance, hazards, near misses, accidents and incidents regardless of severity.

During engineering and operational phases of the works the following categories of POWERPIPE full time personnel shall be used:

Sr.No.	Designation	No of personnel
1.	Project Manager	1
2.	Project admin	2
3.	Project Supervisor	1
4.	Welding supervisor	1
5.	Foreman	2
6.	Pipe fitter	4
7.	Welder	4
8.	Helper	6
9.	Safety manager	1
10.	Safety Officer	2
11.	Fire watcher	2
12.	Rigger	4
13.	Hot Tapping , Line Stop Operator	4
14.	Scaffolder	4
<b>Tentative number of Manpower</b>		<b>38</b>

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The responsibilities of each position are as follows:

1. Project Supervisor / Safety Officer

Reports to Project Manager

The Project Engineer is responsible for all operational and fiscal aspects of the Project and is empowered to make Project related decisions on behalf of POWERPIPE. He is also an In-charge of performance management of vendors.

He will also be the primary on-site point of contact for the client and be responsible for generating the appropriate documentation including but not limited to the following:

- Job specific procedure
- Daily Operations Reports
- Equipment and personnel time sheets
- Completion certificates
- Tool Box Talks
- JSA's

2. Technician/Operator

Reports to the Project Engineer

The Operator's responsibilities include the safe and efficient operation of equipment and assisting in the compiling of clear and concise records of operations.

Pro-actively contributing to the overall site safety by reporting near misses and accidents to the site Project Engineer.

3. Inservice Welder

Reports to the Welding Engineer

The welder responsibilities include the safe and efficient inservice welding as per approved WPS in coordination with API-1104.

#### Refer Annexure

#### General Information

The client reporting and investigating procedure will take precedence in the event of an emergency.

However, any incidents involving injury to POWERPIPE personnel, damage to equipment, or high potential "Near Misses" will also be reported through POWERPIPE own reporting system, the Global Crisis Management plan.



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## 4 OPERATIONAL REQUIREMENTS

### 4.1 Pre-Job Safety Meeting & Toolbox talk

Prior to starting operations, the POWERPIPE Project Engineer and the Client Representative will hold a pre-job safety meeting. This meeting shall be attended by all relevant personnel and the forthcoming operations discussed. The following items should also be noted:

- All non-essential personnel will be excluded from the operation area.
- Heavy lifts are not permitted over POWERPIPE Equipment during Hot Tapping operations.
- POWERPIPE and operational personnel have checked the escape routes and made contingency plans.
- Adjacent systems shall be configured so that pressure cannot accumulate.
- Project Engineers to conduct formal shift handover.
- In addition to the above, toolbox talks will be held prior to any task/operation commencement. All personnel involved in operations will attend.
- The Project Engineer will brief all operatives in the ensuing operations, risk assessments reviewed and all necessary safety precautions discussed.
- Work permits to be signed off accordingly per shift.

### 4.2 System & Equipment Preparation


Pre-mobilisation and post-mobilisation (i.e. all Hot Tap and line stop Equipment along with its related accessories should be tested prior to mobilisation from POWERPIPE work base and on site prior to commencing operations) checks & function tests will be carried out to ensure that the equipment supplied for the project is suitable for the work scope. All equipment will be calibrated and fully certified. In addition, all fittings/connections/adapters on POWERPIPE equipment and PTT owned Equipments will be inspected upon completion of equipment being set up on location.

### 4.3 Method Statement for In-Service Welding, Hot Tapping & Line Stopple Plugging.

#### IN-SERVICE WELDING

##### General

- There are 2 primary concerns with welding onto in-service pipelines. The first concern is to avoid "burning through" where welding arc causes the pipe wall to be breached. The second concern is for hydrogen cracking, since welds made in-service cool at an accelerated rate as the result of the flowing contents ability to remove heat from the pipe wall.
  - Burning through is unlikely if the wall thickness is 6.4 mm. or greater, provided that low-hydrogen electrodes (EXX18 type) and normal welding practices are used.
  - Electrodes shall conform to AWS A. 5.1/AWS class Exx16 or Exx18 basic coated low-hydrogen electrodes shall be specified in the Welding Procedure Specification.
  - Electrodes shall be stored in accordance the Manufacture's instructions in their original containers, which shall be marked with the Manufacture's name, the consumable Trade name, and the batch number.
- Qualification of Welding Procedures**
  - Approved Welding Procedure Specification (WPS) & Procedure Qualification Record (PQR) shall be submitted which tested and qualified in accordance with API 1104 Appendix B.

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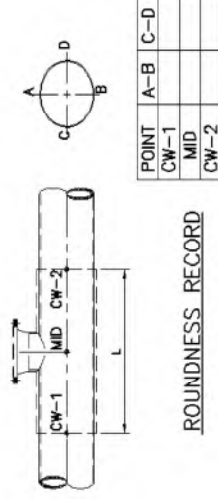
### 1.1.3. Work preparation of welding and testing of Split tee

#### > Surface cleaning

- Mark the desired location of the hot tap fitting.
- Clean the existing pipe in the area to be inspected to bare metal by mechanical means to remove all coatings, dirt, grease and other contaminants. Necessary precautions need to be taken not to remove the parent metal during cleaning.

#### > Visual inspection & defect check of area to be welded


- The section of the run pipe to which the branch pipe or fitting is to be attached shall be thoroughly cleaned with a wire brush for a distance extending to a minimum of 150 mm either side of the branch or fitting. After cleaning, the run pipe shall be visually examined for laps, cracks, pitting or other form of damage. The fitting shall be located so as to avoid welding on minor flaws in the run pipe.
- Visual examination of non-existence of Pitting and corrosion on the selected area for Hot Tapping
- Roundness check. For full encirclement tees or sleeves, the run pipe shall be measured with callipers to ensure that ovality is acceptable for accommodation of the proposed tee or sleeve as below picture, ovality of each direction shall not be over 3 mm to avoid gap of split tee and run pipe

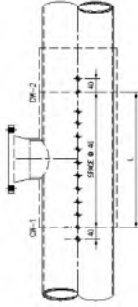


#### ROUNDNESS MEASUREMENT

- Ultrasonic thickness measurement (UTM). The specific areas of the run pipe where attachment welds are to be made shall be ultrasonically examination the actual wall thickness for every 40-50 mm interval, the minimum actual wall thickness shall be used for heat input calculation



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THICKNESS ON LONGITUDINAL

POINT	1	2	3
LW-1			
LW-2			

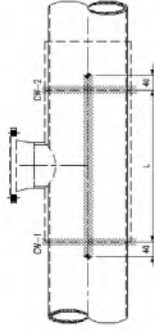


THICKNESS ON CIRCUMFERENCE

POINT	A	B	C
CW-1			
CW-2			

#### ACTUAL WALL THICKNESS VERIFICATION

- Radiographic Testing for pipe seam verification  
Existing pipe must be verified for seam position by radiographic test ting (RT). Seam of pipe shall not locate near the pilot drill, distance of pipe seam shall be 2 inch away from edge of pilot drill
- Ultrasonic Limitation free scan (UTL). Ultrasonic examination shall be examined to ensure freedom from lamination



LAMINATION FREE SCAN AREA

#### LAMINATION FREE SCAN OF AREA WHERE ATTACH WELDMENT


#### ➤ Alignment and welding practices

##### Offset

- Pre-assembly of fitting on existing pipe shall be verified to ensure the curvature of fitting and pipe surface is within tolerance.
- The offset between the abutting edges for Groove welds should not exceed 1.6 mm. to obtain this alignment, devices should be used, or misaligned surfaces can be built up with weld metal.
- 2 sets of chain blocks shall be used to achieve an offset up to a maximum of 1.6 mm.

##### Root Opening

- The two halves of fitting should be clamped together around the pipe.

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- Before the fitting is finally clamped together, Carbon steel backing strips shall be inserted into the machined recesses at the roots of longitudinal welds.
- The backing strip material shall remain within the essential variables of welding procedure qualification.
- The backing strip extension beyond the edges of the fitting shall be a minimum of 150 mm to allow attachment of suitably size run-on/run-off plates.
- Before the fitting is clamped, all visible surface grease in and around the recess of the branch flange, backing strip shall be removed by solvent cleaning.

#### ➤ Bevels

- Dye Penetrate Testing shall be performed on the bevels.
- Immediately prior to welding, the fusion faces and the adjacent material shall be free from planar defects, tears, moisture, scale, rust, paint, grease or other matter.
- Cleaning area shall extend to a minimum of 25 mm from the edge of the fusion faces on both the internal and external surfaces of the fitting.
- Where the fitting thickness is greater than twice the run pipe wall thickness, the fitting shall be chamfered at 45 degree to enable fillet weld leg lengths of two times the run pipe wall thickness, see Figure 5

#### ➤ Cleaning:

- Each run of weld metal shall be thoroughly cleaned with hand or power tools before a further run is applied.
- Visible flaws such as cracks, cavities and other deposition faults shall be removed before deposition of further weld metals.

#### ➤ Fit-up

- A Yoke-type clamp or chain blocks shall be clamped around the circle of run pipe. Maximum gap between ID of split Tee fitting and OD of the run pipe should be: max 3.2 mm
- Longitudinal groove welds; Max. Gap not exceeds 5 mm. along the longitudinal bevels.
- Circumferential fillet welds Max. Gap not exceeds 1.6 mm. around circle of run pipe.
- Verify that the axial centerline of the Tapping path intersects the axial centerline of the run pipe at right angles.
- Maintain a positive support of the Tapping fitting especially the flange alignment.

#### ➤ Tack welding:

- Tack welding is recommended the circumferential should be done on the sequence of opposite side such as 12 o'clock & 6 o'clock, 3 o'clock & 9 o'clock (or equivalent to avoid longitudinal groove ends position)


- Number of Tack welds the longitudinal should be available on qualified welder skill.

#### ➤ Welding Sequence:

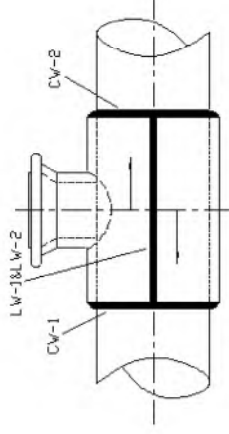
##### a) General

- Prior to start welding, Customer to confirm that the flow rate of the line being weld shall not be less than 0.4 m/s
- The welding sequence for split tees shall be shown in Figure-1.
- b) Longitudinal groove welds ( LW-1 & LW-2)
  - Using 2 two welders where the fitting is 750 mm or more in length, weld both longitudinal seams simultaneously. Start the welds from the center of the fitting in opposite directions and progress to the ends.




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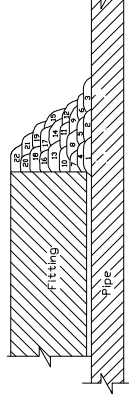
- Repeat this step, staggering the start/stops, until the seams are 1/3 of the cross-sectional area of the welds.
- Complete the longitudinal seams until full of the cross-sectional of the welds. This can be accomplished using one or two welders, which welding may progress in the desired direction or from one end to the other.
- Circumferential fillet welds (CW-1, CW-2)
  - Circumferential welding shall only commence after completion of longitudinal welds.
  - Circumferential tack shall be removed after completion of longitudinal welds.
  - The welds bead deposition sequence shall be welded as shown in passes sequence of Figure 2.
  - The second circumferential fillet weld shall only be started after completion and cooling of the first fillet. At no time shall circumferential fillet welds be attempted simultaneously.
- d) Buttering for circumferential fillet welds
  - Buttering technique shall be used on the run pipe wall as shown in the passes 1 – 3 of Figure 3. Additional reinforcement shall be applied over the buttering layer where the gap between the fitting and run pipe exceeds 1.5 mm, as shown in passes 4-6 of Figure 4.
  - The first buttering pass shall be deposited as close as possible to the fitting without impinging or making any attachment to it.
  - The fillet leg length and gap between the pipe and fitting shall determine the number of buttering passes required. Pass 6 or its equivalent without impinging on the run pipe wall.
- > **Number of welders:**
  - Longitudinal groove welds where the fitting is 750 mm or more in length, at least 2 welders shall work on each seam (if site condition is applicable).
  - Circumferential fillet welds on pipe of 323.9 mm (8") OD and larger, 2 welders shall be employed working on the opposite sides of the pipe (if site condition is applicable). At no time shall the welders' weld pools have less than 50 mm separation.



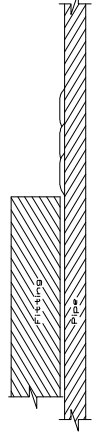
**Figure-1 Encirclement Split Tee fitting Welding sequence**

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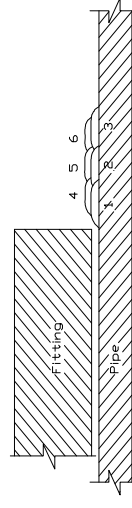
NOTE: Welding of longitudinal welds to commence in the center of tee. Weld starts shall be overlapped and ground. Welding to continue in this manner until 10 mm to 12 mm in cross sectional thickness is deposited.



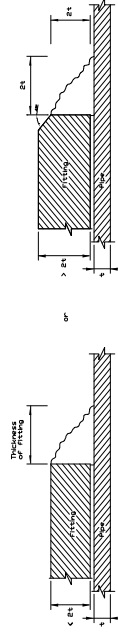
**Figure 2 Weld bead deposition sequence**



**Figure 3 Detail of buttering layer onto pipe**



**Figure 4 Suggest method of reducing gap between pipe and fitting before welding to fillet throat**




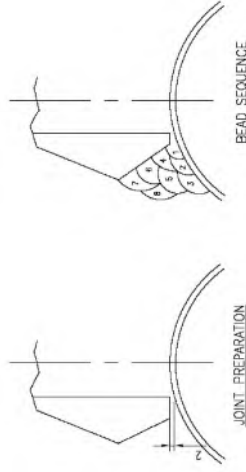
**Figure 5 Dimension of fillet leg length to suit thickness of fitting**

- > **Alignment and welding practices for O-let fitting**
  - Maintain gap between 2-3 mm, for complete joint penetration of root pass
  - The welding sequence shall be shown in Figure-6





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**Figure 6 : Alignment and welding practices for branch nozzle with O-let fitting**

#### 1.1.4. INSPECTION AND TESTING

##### > Visual inspection:

- All welds shall be inspected by visual inspection during and after welding to ensure that slag is removed between passes.
- Undercutting shall be treated by grinding and blending provided that the specified minimum wall thickness for the pipe and fitting are maintained.

##### > Non-Destructive Testing:


- **Root pass:** for both groove weld and fillet weld prior to deposition of further weld metal shall be performed Magnetic Particle Testing on the completed of The root pass
- **Hot pass:** for both groove weld and fillet weld Every layer of hot pass shall be performed Magnetic Particle Testing
- **Finished pass:** The completed assembly welds shall be magnetic particle inspected not sooner than 24 hours after completion of the joint.

##### > Sequence of weld Beads Inspection Testing Table

Groove Weld No. LW1 / LW2 (Longitudinal Weld)

Sequence No.	Beads	Electrode	Dia. (mm.)	Process	Inspection				Note
					VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X		X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	



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#### Circumferential Weld / Fillet weld

Sequence No.	Beads	Electrode	Dia. (mm.)	Process	Inspection				Note
					VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X	-	X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	MT Delay crack

##### > Strength Test Pressures:

- The test pressure will depend on the actual internal pressure of the run pipe at the time of the hot-tap and the ability of the run pipe to withstand external pressure.

##### > Pressure Test:

- For split tees, the maximum allowable pressure differential ( $\Delta P$ ) with respect to buckling of the run-pipe calculated as defined in ASME VIII, Division 1, Section UG-28.

- Therefore  $PT = PA + \Delta P$

- Where PT = test pressure And PA = actual operating pressure in the run-pipe


##### > Testing Media:

- Where practical, the testing medium shall be water. In some applications where it is desirable to avoid water in the split-tee annulus, the use of liquid hydrocarbons may be suitable, subject to acceptable safety precautions. For the condition of operating temperature higher than 100 C, hot oil shall be used for testing.

##### > Testing Duration:

- Testing of branch connection, with the valve installed and in the open position, to demonstrate leak tightness and strength. Duration should be at least 15 minutes.



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## 1. Welding Hot Tap, Line Stop Fittings and its Accessory Fittings into 24" Header Line.



- Experienced In-service welders qualified should be deployed to execute the welding of fittings.
- Pipe line should be exposed and all painting should be removed at Marked location where Hot Tapping Operation need to be carried out.
- Thickness survey and Ultrasonic Lamination Check of the pipeline areas where Hot Tap Fitting to be welded will be conducted by a certified testing agency.
- UTL reports will be reviewed by the PTT Representative and Approval/permit for taking up the welding activities will be issued by the same.
- One number of 24"x20"x300# Hot Tap Fitting along with Surelock Flange and 20" x 300# Full Bore Gate Valve , 24"x24"x300# Line Stopple Fitting , 24"x2"x300# TOR Fitting , 24"x4"x300# Vent Fitting is welded where UTL is carried at Upstream and Downstream Locations.
- All welding shall be as per API 1104 Appendix B.
- A Minimum flow shall be maintained during welding to dissipate the generated heat during welding.
- At No-Flow condition the cooling rate of each weld bead is noted and its ensured that there won't be any temperature buildup in the weld area. Once after confirming the same the welding activities are proceeded.
- Branch Pipe is welded first, and then the Reinforcement pad is welded.
- Temperature of weld areas are regularly noted using calibrated Temperature Measuring instrument.
- Non-destructive tests (NDT) shall be done, during and after welding as specified in the approved WPS.



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## 2. Sandwich Valve / Isolation Valve Installation

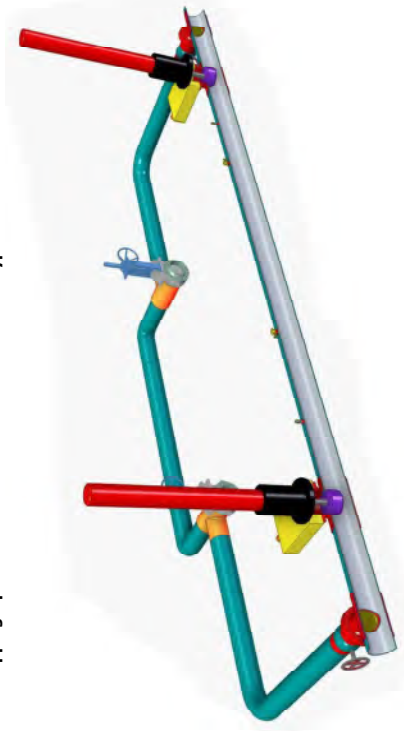


- 24"x 300 # Sandwich Valves are installed upon the Line Stop fittings.
- 2"x 300 # Ball Valves are installed upon the Pressure Equalization fittings.
- 4"x 300 # gate Valves are installed upon the Vent fittings.
- It's made sure that the valves are full bore and 100 % open.



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### 3. Hot Tapping Operation and Installation of Permanent Bypass Line



#### 3.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer.
- Pressure testing of Hot-tapping machine.

#### 3.2 Discussion with pipeline owner, contractor


- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job: OSHA or international; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners, blind flanges, OSHA or owner specified, approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre tested ANSI class FULL BORE ID gate valves furnished by Contractor or Owner
- Demonstrate of hot tap equipment to customer satisfactory

#### 3.3 Remove blind flange.

- Check raised face of the Hot Tap Fitting Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.

#### 3.4 Clean valve faces & Install Full bore ID Tapping Valve:

- Install new gasket on all connection
- Lower valve into the fitting slowly, keeping stud free in flange bolt holes.
- Open Tapping valve and align bore of valve with bore of the fitting as near perfect has possible.
- Install studs & nuts and tighten evenly using the proper sequence
- Take required Tapping measurement

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### 3.5 Check Tapping Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Measure valve for sufficient housing space for cutter and pilot. Face of valve to seat rings. Record this dimension.

### 3.6 ASSEMBLE THE TAPPING MACHINE:

- Check boring bar drive ring for tightness and damage.
- Check the retainer shaft packing nut. Packing nut must not extend out onto the taper of the boring bar.
- Clean ring joints and steel ring gasket.
- Install adapter on tapping machine adapter and snug the top two bolts, leaving others loose.
- Extends the boring bar beyond the face of the adapter. Install the cutter holder in the boring bar. Tighten the retainer shaft with the measuring rod. Install the safety pin with cotter pins on both ends.
- Check cutter teeth and outer diameter of the cutter, install cutter on cutter holder and tighten the socket head bolts and lock nuts. An acceptable alternative is to assemble the cutter and the cutter holder before installing the cutter holder in the boring bar.
- Check the U-rods, pilot drill, and nylon lock pin in pilot. Then install pilot in the cutter holder and tighten.
- Align the adapter with the cutter and tighten adapter bolts. For alignment reference, measure from the outer diameter of the cutter to the outer diameter of the flange raised face. Rotate the cutter 180 degree and recheck the alignment. If alignment changes when the cutter is rotated check the cutter, cutter holder, and boring bar for damage.
- Retract the boring bar and cutter all the way. Take measurement with the measuring rod.

### 3.7 CALCULATE THE TAPPING DISTANCE:

- Measure the distance from the pilot tip to the face of the adapter (Measurement A).
- Measure distance from top of the valve to the top of the pipe wall (Measurement B).
- Calculate distance the pilot and the cutter must travel to complete the tap after the pilot contacts the pipe wall (Measurement C).
- If the pilot is inside the adapter, total of A+B equals the distance the pilot must travel to contact the pipe.
- If the pilot tip extends beyond the face of the adapter, total of B-A equals the distance the pilot must travel to contact the pipe wall.
- Measure the distance the pilot tip extends beyond the cutter teeth.






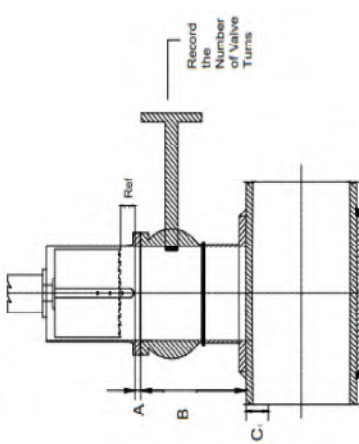
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**Hot Tapping Measurement Card**  
for 24"x20"


Header Pipe OD : ..... Date : .....  
Branch Size : .....  
Pipeline Thk : .....  
Cutter OD : .....


$$C_1 = \left( \frac{259.00}{2} \right) - \left[ \left( \frac{259.00}{2} \right)^2 - \left\{ \frac{CUTTER\ OD}{2} \right\}^2 \right]^{1/2}$$

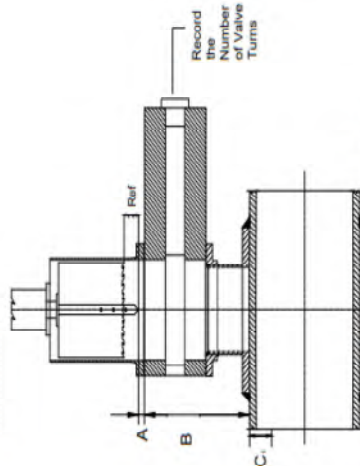
A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-In Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C <sub>1</sub> + Ref	
Total Travel, Lower-In + C	
Max. Tapping Distance	

Max. Taping Distance = Lower-In Distance +  $\left( \frac{259.00}{2} \right) + Ref + 1/8"$



**Hot Tapping Measurement Card**  
for 24"x24"

Header Pipe OD : ..... Date : .....  
Branch Size : .....  
Pipeline Thk : .....  
Cutter OD : .....


$$C_1 = \left( \frac{259.00}{2} \right) - \left[ \left( \frac{259.00}{2} \right)^2 - \left\{ \frac{CUTTER\ OD}{2} \right\}^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-In Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C <sub>1</sub> + Ref	
Total Travel, Lower-In + C	
Max. Tapping Distance	

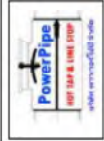
Max. Taping Distance = Lower-In Distance +  $\left( \frac{259.00}{2} \right) + Ref + 1/8"$





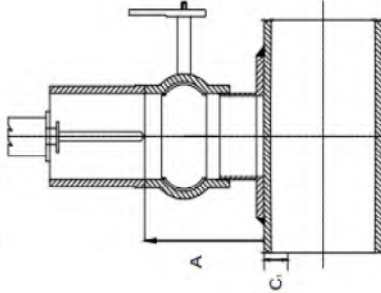


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### Hot Tapping Measurement Card for 24"x2"

Header Pipe OD	Date
Branch Size	
Pipeline Thk	
Drill Bit Dia	



$$C_1 = \left( \frac{PIPE OD}{2} \right) - \left[ \left( \frac{PIPE OD}{2} \right)^2 - \left( \frac{DRILL OD}{2} \right)^2 \right]^{1/2}$$

A Top of the Valve to Top of the Pipe	
= Lower-in Distance	
C <sub>1</sub> Tapping Distance from Calculation	
Total Travel , Lower-in +C <sub>1</sub>	
Max. Tapping Distance	

$$\text{Max. Taping Distance} = \text{Lower-in Distance} + \left( \frac{PIPE OD}{2} \right) + 1/8"$$

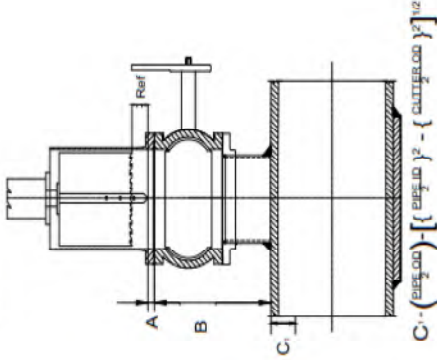


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### Hot Tapping Measurement Card for 24"x 4"

Header Pipe OD	Date
Branch Size	
Pipeline Thk	
Cutter OD	



$$C_1 = \left( \frac{PIPE OD}{2} \right) - \left[ \left( \frac{PIPE OD}{2} \right)^2 - \left( \frac{CUTTER OD}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel , Lower-in +C	
Max. Tapping Distance	

$$\text{Max. Taping Distance} = \text{Lower-in Distance} + \left( \frac{PIPE OD}{2} \right) + \text{Ref} + 1/8"$$

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### 3.8 Install Tapping Machine on the Tapping Valve.

- Align bolt holes on the flanges.
- Install bolts and tighten evenly.
- Install bleeder valve and leave it open.


### 3.9 Perform leak test of machine assembly & Operational check

- Pack Nitrogen into machine set-up to displace any possible pressure of air in between tapping machine, adapter, valve and fitting and pressure test (Leak Test) assembly to customer specification to ensure bubble tight seal on all bolted connections prior to any hot tapping.

### 3.10 Hot Tapping Operation -

- Take all the required measurements, record them on measurement card and mark the same on measuring rod.
- Calculate the cutting distance and time required for cutting.
- Re-check number of 'U' rods coming under the span of calculated cutting distance.
- Re-check that boring bar is fully retracted.
- Assemble the Hot tapping machine on the Gate Valve.
- Close the Isolation valve (Count and record the number of turns).
- Check for alignment in all directions and tighten the bolts.
- Open the Isolation Valves (Count and record the number of turns).
- Open the bleeder valve and ON the nitrogen supply.
- After few minutes, CLOSE the bleeder valve and raise the pressure as required by test norms (Generally 1.1 times the working pressure).
- Leave the set-up pressurized for 15 minutes; Check all flange and threaded joints for any leakage using soap solution or any other approved method.
- LOWER-IN the boring bar manually as per measurement (By turning the crank handle clockwise) till you feel that Pilot drill has touched the top of the pipe, and cross check with measuring rod.
- Retract the boring bar 3 to 4 turns (turn anticlockwise).
- Engage the power source with machine drive.
- Open the Tapping machine control valve.
- Complete the pilot drill (According to measuring rod), also can be verified by checking the rise or drop in pressure gauge fitted.
- Once the pilot is complete, Close the machine control, Disengage the machine from power source and drive the boring bar manually till the cutter touches the top of the pipe (check the marked indications on measuring rod) also can be re-checked by one's feel.
- Retract 3 to 4 turns and engage the power source with machine drive, Open the Tapping machine control valve.
- Complete the tapping (According to measuring rod).
- Once the Tapping is complete, close the machine control, Disengage the machine from power source and drive the boring bar manually for 1/8".
- Just open the machine control and rotate the boring bar (Cutter) without engaging the clutch for few minutes to ensure that coupon is free.
- Close the machine control, OFF the power source.
- Retract the boring bar manually till initial reading (marked on measuring rod).
- Close the Isolation valve (cross check the 100% closing by counting the number of turns); open the bleeder valve to drain out the product remaining in the machine housing.
- Once draining is complete, remove the Hot tapping machine and handover the coupon to PTT.



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- Install Flow through Guide Bar on 24"x 20"x 300# Hot Tap Fitting at Upstream and Downstream Locations.
- Cut the 20"WNRF Flange from the Hot Tap Fitting and Weld the New Permanent Bypass line (Hydrotested) at Upstream and Downstream Locations.
- Above Procedure is to be repeated for carrying Hot Tapping on 24"x24"x300# , 24"x2"x300# , 24"x4"x300# Fittings.

## 2. LINE STOP PROCEDURE



### 4.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer
- Pressure testing of Hot-tapping/Line Stop machine.

### 4.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or international; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment
- Confirm valve data, dimensions, on pre-tested ANSI class full bore valves

### 4.3 Remove blind flange

- Check raised face of the Line Stop Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.



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#### 4.4 Check Isolation Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Assembly line stop machine with plugging head
- Customer to confirm the velocity in line prior to line plugging.
- Install Line Stop Machine on Sandwich valve , Pressure Equalization need to be carried out using 2" TOR Fitting .
- After the Pressure is equalized ,Open the Sandwich Valve Gate.
- Set plugging head into the line. ( Always Downstream Plug to be set first.)
- NOTE: Pressure, flow rate, velocity will be considerations to look into and discuss/verify with the customer prior to job commencement.

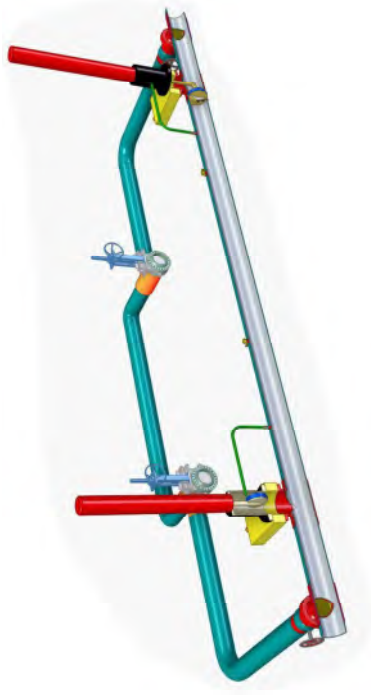


Fig. Insertion of Downstream Stopple Plug into Pipeline.

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Fig. Insertion of Upstream Stopple Plug into Pipeline.

#### 4.5 Relieve pressure in isolated section and check for seal integrity.

- After plugging machine is set, close the 2" Pressure equalization valves , Dismantle the Hose.
- Isolate the Section using 4" weld-olet fitting.
- The Stopple Seal Integrity can be verified during this stage using Pressure Gauges .
- Monitoring pressure at downstream portion for 0.5 hours, if there is no pressure built up customer is able to perform pipeline modification works.
- Dead Seton is subjected to Nitrogen Purging , then Cold Cutting is carried out.

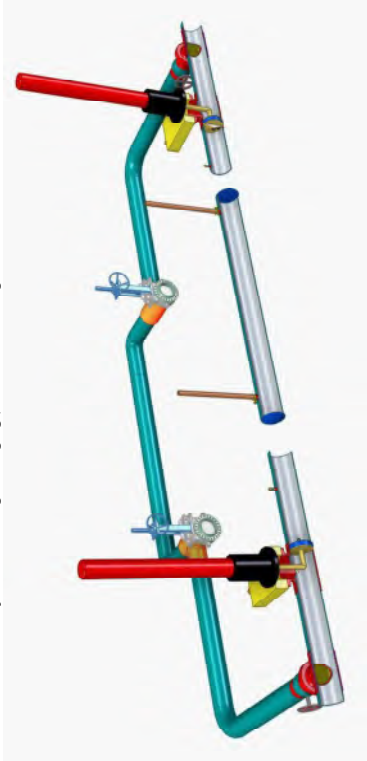



Fig. Cold-Cutting of Header Pipe and Welding of Dish Ends into the Dead Section.



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#### 4.6 Proceed to Remedial work & Re-Commissioning of 24" Header Line.

- Gas Check
- N2 purging if required
- Cutting undesired portion.
- Welding of 5D bends into Existing 24" Header line & golden joints are subjected for Radiographic examination at Upstream and Downstream Location.
- After the Successful NDE results , the Header line is re-commissioned using 2" TOR Fitting.



Fig. Welding of 24" 5D Bends into Header line



Fig. Re-Commissioning of Header line using 2" TOR Fitting

#### 4.7 Stopple Plug Retrieval and Dismantling of Stopple Assembly.

- After pressure equalization, Upstream Stopple Plug is retracted first , then Downstream Stopple is retracted.
- Close the 24"Sandwich Valves and 2" Equalization valves .
- Open bleeder valve to relieve trapped pressure in Stopple Housing , Dismantle the Stopple Housing Assembly.


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Fig. Stopple Plug Retraction

#### 4.8 Temporary and Permanent Line Blinding.


- Check OD of plugs.
- Install plug and plug holder to tapping machine.
- Clean, check for damage and lubricate.
- Install the tapping machine on Sandwich Valve , Equalize the Pressure , below and above the Sandwich Valve Gate.
- Open the 24"Sandwich valve.
- Extend to insert special LOR Plug ( completion Plug with Coupon welded ) into set position, engage segments in LOR flange and fully retract boring bar.
- After the completion Plug is installed , Release the trapped pressure in the adaptor using bleeder valve , and check for any pressure build up above the completion plug.
- Once no pressure build up found , Dismantle the Tapping machine assembly and 24" Split-Tee are permanently blinded by installing BLRF Flangesat Upstream and Downstream Locations.
- 2" TOR is temporarily blinded with Brass plugs and Permanently blinded with end caps tack welded.



Fig. Permanent Line Blinding using Completion Plugs and Blind Flanges








**PowerPipe Co., Ltd.**

Hot tap fitting, split tee  
In-service welding  
Hot tapping services  
Line stop services  
Piping services



## PROJECT METHOD STATEMENT

Hot tap & Line stopping

For pipeline modification

Section 1 ESP park- NR2



PTT PUBLIC COMPANY LIMITED

PROJECT	: RE-ROUTE PT PIPELINE HSR 4-2
Owner	: PTT Public Company Limited
CONTRACTOR	: SIAMRAJ PCL/POWERPIPE CO., LTD.
PwP Project No.	: J2202
Siamraj Doc.No.	:
PwP Doc.No.	: PwP-MST-01 for section 1 (ESC park – NR2)

POWERPIPE REVISION RECORD				
Rev	Date	Status Description	Prepared POWERPIPE	Checked Siamraj PCL.
R0		Submitted for Approval	Leston Rihal Dsouza	Approved -PTI-

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1.0 INTRODUCTION

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1.1 General information


This document covers the safe working practices for the execution of Hot Tapping and Line Stopping Plugging operation Including In-service welding works.


It is the responsibility of POWERPIPE project execution team and shall be adhered to all personnel involved with the operation.

The purpose of the project is to "**RE-ROUTE PTI PIPELINE HSR 4-2**".

1.2 Abbreviations and Definitions

Terms	Definition
Psi(a),Psi(g)	Pressure in Psi, absolute and gauge
Owner/Client	PTT
Main Contractor	Siamraj PCL.
Hot tap Contractor	POWERPIPE CO., LTD.
HSE	Health, Safety, and Environment
JSA	Job Safety Analysis
m.	meter
m3	Cubic meter
MSDS	Material Safety Data Sheet
N/A	Not applicable
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PSV/PRV	Pressure Safety Valve/Pressure Relief Valve.
PTW	Permit to Work System
Rev	Revision
Scf.	Standard Cubic Foot
FlM	Free Issue Material

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Project			Re-route PTT pipeline HSR 4-2
Flammable Service			A fluid which, under expected operating conditions, is a vapour or produces vapours that can be ignited and continue to burn in air
Hazardous Substance			Included, but not limited to, those substances that are explosive, combustible, toxic or corrosive
Hot Tapping			The technique of attaching a mechanical or welded branch fitting to piping or equipment in service, and creating an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting.
Gate Valve			A gate valve, also known as a sluice valve, is a valve that opens by lifting a barrier (gate) out of the path of the fluid. Gate valves require very little space along the pipe axis and hardly restrict the flow of fluid when the gate is fully opened. The gate faces can be parallel but are most commonly wedge-shaped (in order to be able to apply pressure on the sealing surface)
Manufacturer/Vendor			The party which manufactures and/or supplies equipment, technical documents/drawings and services to perform the duties specified by the POWERPIPE
On-Plot Piping			Pipe system designed in accordance with ASME B31.1, ASME B31.3 (see Note below)  NOTE: Some parts of a pipeline system, although located "off-plot", may be designed in accordance with ASME B31.3. For the purposes of this specification, such piping shall be considered to be On-plot. Similarly, some refinery piping, although physically located "on-plot", may be designed in accordance with ASME B31.4 or B31.8. For the purposes of this specification, such piping shall be considered to be Off-plot
Operating Conditions			All conditions of piping and equipment when containing hydrocarbons under a positive internal pressure  The existing pipe into which a Hot-Tap is to be made
Run-Pipe			Indicates a mandatory requirement
Shall			Indicates a strong recommendation
Should			Any place where the facilities will be reinstated, constructed and/or installed
Site			

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1.3 Pipeline Data Sheet				
Main Pipeline Size			24 Inch	
Wall Thickness			0.688"	
Pipeline Material			Carbon Steel	
Orientation Of Pipe			Horizontal	
Service Fluid			Natural Gas	
Design Pressure			720 Psi	
Operating Pressure ( Max/Min)			460 Psi	
Design Temperature			176 Deg. Far.	
Operating Temperature			77 Deg. Far.	
Branch Size for Hot Tapping			20 Inch	
Branch Size for Line Stopple Plugging			24 Inch	
Orientation of Tap			12 –O' clock position	
Valve Type			24" X 300 # Sandwich Valve , 20" X 300# Full Bore ball Valve.	
Fitting Type			Fully Encirclement Split Tee	
1.4 Communications				
Throughout the Project communications should be maintained between POWERPIPE Operations Manager and PTI, EIC. If communications fail at any given time, the operation shall cease until communications are re-established.				

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### 1.5 References

1. API RP 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries
2. API 1104 Welding of Pipelines and Related Facilities
3. ASME B31.8 Process Piping
4. ASME B16.5 Steel Pipe Flanges & Flanged Fittings
5. ASTM A 106 Standard Specifications for Seamless Carbon Steel Pipelines
6. API 5L Specification for line pipe.
7. ASME B 16.25 : But Welding Ends.
8. MSS-SP44 Steel pipeline flanges
9. ASME Sec.VII : Boiler & Pressure Vessels Code-Rules for the construction of pressure.
10. ASME Sec. V: Non-destructive examination.
11. ASME Sec. IX: Welding.
12. ASME Sec. VIII Div.1 & 2: Fabrication.
13. ASTM A694: carbon and alloy steel forgings for pipe flanges, fittings, valves, and parts for high pressure transmission service.

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## 2.0 SCOPE OF WORK



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This document gives the detailed requirement to be covered the task as listed below:

- Existing pipe wall thickness check (See PAE-UTM-008)
- U.T. Lamination checking of pipeline (See PAE-UT-004)
- Pipe seam verification (See PAE-RT-001)
- Roundness checking
- Fitting installation
- Welding
- Inspection and testing
- Hot tap operation
- Line stop Operation
- Pipeline modification
- Completion plug installation

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### 3.0 HEALTH, SAFETY & ENVIRONMENT

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A copy of the POWERPIPE Health, Safety and Environmental Management Systems Manual will be kept on site and is available for review by PTT.

The standards and safe working practices outlined in this document will be adopted and referred to throughout POWERPIPE operations on site.

All work will be carried out in accordance with the PTT and the POWERPIPE QHSE Plan.

Every day recording of the manpower available at site before start of the work to be carried out.

### 3.1 HSE Considerations

Safety is the responsibility of every employee irrespective of status. Employees will ensure that their workplace is safe and functions efficiently and safely. Common sense should be applied for 'safe working' practices to be implemented and adhered to at all times. Particular attention will be given to work site safety and to any safety systems and procedures provided. POWERPIPE to complete any Client site specific safety training and site orientation prior to commencing site activities.

Personal Protective Equipment (PPE) will be issued to all personnel. The minimum PPE of hard hat, safety boots, full length coveralls, gloves and eye protection will be worn at all times when working on site.

Barriers will be erected in order to ensure that unauthorised personnel do not enter the worksite, and tannoy announcements will be broadcast to warn personnel of any operations that require the worksite to be barriered off.

All Hot tap and line stop equipments along with its accessories will be checked to confirm that they are of a suitable pressure rating for the task. All air hoses will be secured with whip-checks & R-pins.

On completion of the work scope, and prior to demobilisation, any equipment which is damaged or faulty will be clearly red tagged and an equipment damage report will be completed.

Any equipment which may contain residual chemicals will be clearly tagged, and the base will be made aware of these items prior to the items being demobilised.

### 3.2 Safety Systems

The worksite Permit-to-Work system will be implemented and strictly adhered to at all times. No work will be carried out unless the required Permit has been raised, authorised and signed on. If the scope of work changes during the duration of the Permit, the POWERPIPE Project Engineer will ensure that any changes to the work are discussed with (Company and Client), and the permit modified (if necessary) and re-issued.

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Prior to operations commencing, a Pre-Job Safety Meeting will be held to ensure that all parties involved in, or affected by, the work are aware of its nature and of the hazards involved. The meeting will be held on site and recorded on the Pre-Job Safety Meeting Form. Any outstanding actions following the meeting will be closed out prior to operations commencing.

Any employee shall have the right to stop operations for discussion if he/she feels that there is a breach of safety procedures, or if an unsafe act is taking place.

### 3.3 Site Induction and Permit to Work

All POWERPIPE operational personnel must have attended the PTT site safety induction course prior to commencement of operations. The POWERPIPE Project Engineer will brief personnel on the operational requirements, site hazards and relevant safety issues.

All works must be carried out in accordance with the client safe working procedure. Job Risk Analysis is to be prepared and approved by client HSE before starting work.

### 3.4 Pre-Job Safety Meetings and Toolbox Talks

I. The POWERPIPE Project Engineer immediately prior to commencement of operation will hold a Pre-Job Safety Meeting on site. All personnel involved in flushing operations should be in attendance.

II. The meeting will cover all job and site related hazards, safety controls in place, contingency plans in the event of emergencies and any other points deemed relevant. Any questions or queries should be raised at the meeting. Minutes of the meeting will be recorded on a POWERPIPE Pre-Job Safety Meeting Form.

III. The POWERPIPE Project Engineer will conduct Toolbox talks before each new task/operation is undertaken, which will be recorded on the appropriate form. The purpose of the talks is to inform the POWERPIPE Crew of any potential hazards, safe working practices to be adopted and contingency plans in the event of an incident/accident. Client or third party personnel affected by the works are invited to attend.

### 3.5 Hot Tapping Operation.

- During Hot Tapping operation the surrounding area around-off point will be access restricted by use of barricade safety tape at a distance 10 meters from the tapping point. In addition to this danger signs shall be located in a sufficient distance around the area to warn the personnel of the activity.
- Ensure all the surrounding area is cleaned and all loose construction materials is removed, access to the restricted area shall only be permitted by the supervision.
- Ensure that the surrounding equipment are properly protected from the loose and unwanted materials from the blow off point.

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- iv. Ensure all the required personnel protective equipment such as ear plugs, gloves, safety glasses etc. are to be provided and worn by all the personnel involved in the operation.

### 3.6 Near Miss / Incident / Accident Reporting

- I. It is the policy that all accidents, incidents or near misses involving POWERPIPE personnel, equipment, property, or affecting third parties, must be reported without exception. This includes the operations and employees of companies subcontracted by POWERPIPE Services.
- II. All employees must be aware of these requirements and of their duty to recognize and report any occurrence, which comes within the terms of the POWERPIPE and relevant Client Accident reporting system. POWERPIPE Project Engineer shall satisfy himself that all personnel under his control are aware of this requirement and shall periodically check this fact.

### 3.7 Emergency Response Plan

Following are the major emergency incidents that might occur at site.

- I. Fire / Explosion.
- II. Injury due to lifting operation, fire, electrocution, civil unrest, Natural disaster, Medical also.
- III. Toxication.
- IV. Objects falling from height, sliding, moving parts, drowning, etc.
- V. The possibility of such an emergency occurring although is very less, the company has the requisite preparedness in such an eventuality.

#### FIRE/EXPLOSION LEADING TO EVACUATION:

- I. Fire or explosion that has occurred at site and which is out of control and no longer localized to that section only shall be called as an 'EMERGENCY'. It is left to the discretion of the personnel at site of incident whether to call for an emergency or not.
- II. Emergency will be activated by any of these means – over the phone or by word of mouth or by shouts or using emergency siren. On activation of the emergency at the site, all those present at the work location including Technicians, supervisors, coordinator, helpers shall assemble at the Assembly Point and immediately report to their respective seniors as planned.
- III. The Assembly Point of the Industry or site is the open space present in front of the security room/ where it is safe.
- IV. The Engineer in charge shall report the head-count and the presence of their respective personnel and that of the Technician, supervisor who were under their control. The Manager or his designate who is the head-count man shall be the Site Incident Controller. He shall first ensure that the working area has been completely evacuated.

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- V. Site Incident Controller will assume full control of the administrative aspect of the emergency. He shall dictate the immediate action to be taken at the Scene of incident. He shall guide the assembled people on further course of action.

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

Note:

- I. During an emergency always ensure that you do not panic or give any scope for confusion or chaos.
- II. Do not spread rumors or gossips.
- III. All shall adhere to the instructions delivered by the Site Incident Controller.
- IV. Make way for the emergency fighting resources to reach the source of incident.

#### TOXICATION:

Many chemicals found in the pipeline/work place have a harmful effect on humans. These chemicals may enter the body through skin absorption, through respiratory or elementary systems. Harmful effects may become apparent immediately or in the short / long term. In case of emergencies where gases enter the atmosphere is a critical area, as volumes of dangerous impurities are difficult to measure. It is therefore essential to that detection of any traces of dangerous gases above the Threshold Limit Value (TLV) and take the necessary safety precautions.

Special attention is drawn to the possible presence of extremely poisonous substances.

#### INJURY WHILE WORKING, FALL FROM HEIGHT/OBJECTS FALLING FROM HEIGHT

While working at a height or while working/ walking near the site of works the possibility of fall from height or objects falling down is present and injury while working.

When you find someone being injured while working or by fall or by an object falling from a height.

- I. Immediately isolate the person from the source of injury ensuring that further danger or severity is arrested.
- II. Call for qualified assistance.
- III. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

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#### EMERGENCY NUMBERS AND TRAINED FIRST AIDERS

<p>EMERGENCY PHONE NUMBERS:(IN HOUSE)</p> <p>Anywhere in India (Toll free)</p> <p>FIRE – 101</p> <p>AMBULANCE – 102/108</p> <p>POLICE – 100</p> <p>PROJECT INCHARGE –</p> <p>HSE OFFICER –</p> <p>HOSPITAL –</p> <p>AT PLANT</p> <p>FIRE STATION – FIRE</p> <p>MEDICAL- SECURITY-</p>
---

#### TRAINED FIRST AIDERS AND FIRE FIGHTERS

NAME	DESIGNATION

#### CIVIL UNREST

- I. Civil unrest, is an activity arising from a mass act of civil disobedience (such as a demonstration, riot, or strike) in which the participants become hostile toward authority, and authorities incur difficulties in maintaining public safety and order, over the disorderly crowd. It is, in any form, prejudicial to public law and order.
- II. Familiarize yourself with the route, site set-up, and range of exits, help & security points.
- III. know alternative routes on different modes of transport
- IV. calculate plenty of time, set out early
- V. agree on a plan should you get separated while in a crowd
- VI. plan for an agree on potential emergency scenarios should you get hurt
- VII. Carry some minimal items on your person: pocket first aid including burns, marker pen, tape, water etc.
- VIII. Be identifiable, have emergency contacts cards on person.
- IX. comply as instructed by public safety and health agencies and their reps
- X. assist others if you can to help reduce potential congestion, disorder or panic but always consider your own safety - keep alert and focused, rest often, keep hydrated
- XI. Save your phone battery life: text rather than call, turn screen brightness low, keep essential calls short but keep your family friends & colleagues updated. Let them know you are safe

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- XII. Redundancy: helmets and other recreational gear can double as personal protection in extreme conditions.

#### MEDICAL EMERGENCY

- I. A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies such as cardiovascular (heart), respiratory, and gastrointestinal cannot be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from first aiders through Emergency Medical technicians, paramedics, emergency physicians and anesthesiologists.
- II. Stop Work: Abandon any plant, equipment or area immediately if a medical emergency occurs
- III. Assess the Risk: Check for Danger. Secure the area and Raise the Alarm what is the cause of the medical issue? Is it related to the work currently being performed? Has the patient been exposed to a dangerous environment (e.g. electricity, vehicle incident, fall from height) or is it due to personal health issues (e.g. heart attack, stroke), your priority should be to keep yourself and others safe. Decide if you are competent to manage the incident.
- IV. Notify: Report the incident to the site in charge immediately. They may take responsibility for managing the incident. If they are not available, contact Health, Safety, and Environment & Quality (SHEQ) Officer. If necessary, any people not involved in managing the incident should proceed to the emergency assembly area at the entrance of the site. As required, The Facility Manager or SHEQ will contact the relevant authorities immediately: Fire, Ambulance or Police. External authorities may take control of emergency response at the site.
- V. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### NATURAL DISASTER

A natural disaster is a major adverse event resulting from natural processes of the Earth like:, floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover and also on the infrastructure available.

Tornado:



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- I. Small interior rooms on the lowest floor and without windows.
- II. Hallways on the lowest floor away from doors and windows.
- III. Rooms constructed with reinforced concrete, brick, or block with no windows.
- IV. Stay away from outside walls and windows.
- V. Use arms to protect head and neck.
- VI. Remain sheltered until the tornado threat is announced to be over.

#### Earthquake:

- I. Stay calm and await instructions from the Emergency Coordinator or the designated official.
- II. Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- III. Evacuate as instructed by the Emergency Coordinator and/or the designated official.

#### Flood: If indoors:

Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.  
Follow the recommended primary or secondary evacuation routes.

#### Flood: If outdoors:

- I. Climb to high ground and stay there.
- II. Avoid walking or driving through flood water.
- III. If car stalls, abandon it immediately and climb to a higher ground.

#### Hurricane:

- I. The nature of a hurricane provides for more warning than other natural and weather disasters.
- II. A hurricane watch issued when a hurricane becomes a threat to a coastal area.
- III. Once a hurricane watch has been issued: Stay calm and await instructions from the Emergency Coordinator or the designated official.
- IV. Moor any boats securely, or move to a safe place if time allows.
- V. Continue to monitor local TV and radio stations for instructions.
- VI. Move early out of low-lying areas or from the coast, at the request of officials.
- VII. If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- VIII. Collect drinking water in appropriate containers.
- IX. Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- X. Leave areas that might be affected by storm tide or stream flooding.

#### COMMUNICATION

- I. All communication to be through site in charge and External communication will be done by Coritech to media or any other.

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- II. The main channel of communication between the command center and incident command post is via telephone/ shouting.
- III. All-important contact telephone numbers, e.g. Government agencies, external bodies are displayed near the assembly point point.
- IV. The security guard is responsible for taking the head count, in coordination with the hseq department.

#### EMERGENCY TEAM

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

#### MOCK DRILLS

Regular mock drill shall be conducted as per approved emergency plan at all the above stations. Deficiencies identified & corrective action taken shall be documented. In addition to the mock drills conducted by PTI, POWERPIPE with PTI combined mock drills shall be organized once in two months to test the efficacy of response in emergency situations. Performance & findings of combined emergency drills shall be shared & documented between the organizations to sustain emergency preparedness at the highest level.

- I. Inform all the employees about mock drill.
- II. Fix the date for mock drill.
- III. Observers will not be involved in the exercise. They will monitor the Mock drill.
- IV. Emergency Siren / alarm will be raised.
- V. After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in above.
- VI. Observer will note down the activities with respect to the time.

#### 3.8 Shift Handovers(if applicable)

At every shift change there shall be a time period solely dedicated for the purpose of exchanging a written and a verbal account of the previous shift's operations. It is the responsibility of the POWERPIPE Project Engineer and POWERPIPE Shift Project Engineer to ensure that there is a complete exchange of all information sufficient to allow the "oncoming" crew to safely and competently continue with the

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operations. The shift handover period should include (when appropriate) a complete "walk through" of the systems under test in order to identify strategic areas or points.

### 3.9 POWERPIPE QHSE representative

POWERPIPE project engineer shall act as POWERPIPE site QHSE representative. He shall be responsible for the overall supervision and safety of all POWERPIPE personnel on site (acting POWERPIPE site 'Health, Safety and Environmental Representative'), and will ensure all work activities undertaken are in accordance with Client / POWERPIPE approved work procedures, safe working practices and Permit to Work systems (if applicable).

### 3.10 Risk assessments

A Toolbox Safety Talk will be conducted on site before each new job task or section of a job procedure. All personnel participating in the works will attend, with details of the work, the hazards and the precautions being discussed. Where shift work is in operation, the Toolbox Safety Talk will be given to personnel on both shifts. The talk(s) will be logged in the Daily Operations Report.

Any changes to the scope of work must be risk assessed. Prior to implementation, the changes must be reviewed and accepted by both POWERPIPE and client.

HSE Risk Assessments identify Hazards and the degree of Risk that they pose. Assessments are carried out to indicate the control measures (safety equipment, work procedures, isolation methods, training and communication) required to reduce Risk to an acceptable level. Assessments must be carried out and approved prior to work commencing.

The Risk Assessment Analysis sheet identifies the Hazards and Hazard Effects and is used to assess the Risk as follows:

An Initial Risk Factor will be obtained by assessing the severity and probability (frequency) of the harm that might arise from the Hazard.

Existing or proposed Hazard control measures will be entered against each identified potential accident. These measures should reduce the risk to an acceptable level. If the risk remains unchanged other remedial action should be specified on the sheet until it is reduced.

### 3.11 QC Considerations

The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information as dictated in the procedure. Each task should be ticked completed as the work progresses. During the preparation of the work or its progress, intermediate

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check lists, as required, will be signed off. The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information.

On completion of the works the Project Engineer must collate the completed documentation. The completed documentation will be included in the test report.

### 3.12 Management of Change

POWERPIPE operates a Safety Critical system. All 'Safety Critical' activities defined in this document are identified with the following:

STOP



The Safety Critical system is in place to ensure that all personnel are aware of critical stages as defined in this document.

Changes to procedure may be required as a result of changes in the scope of work.

Deviation from this procedure shall be subject to authorisation by POWERPIPE and PTT and shall be documented on a "Confirmation of Variation Instruction" form (Submitted only if necessary). will be used in any situation where the site works intend to deviate from the approved procedures. The POWERPIPE Engineering site representative is responsible for the development of the management of change and any associated risk assessment. The POWERPIPE Project Engineer will be responsible for compiling, logging and distributing the required forms as applicable and co-ordinating the risk assessment.

The Client representative and the POWERPIPE Project Engineer are responsible for the co-ordination and implementation of the management systems to authorize and manage changes.

### 3.13 Responsibilities

Project Personnel

Shall be familiar with all POWERPIPE Corporate and Project Quality Health, Safety and Environmental issues. They shall be responsible for identifying and reporting any non-conformance, hazards, near misses, accidents and incidents regardless of severity.

During engineering and operational phases of the works the following categories of POWERPIPE full time personnel shall be used:

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Sr.No.	Designation	No of personnel
1.	Project Manager	1
2.	Project admin	2
3.	Project Supervisor	1
4.	Welding supervisor	1
5.	Foreman	2
6.	Pipe fitter	4
7.	Welder	4
8.	Helper	6
9.	Safety manager	1
10.	Safety Officer	2
11.	Fire watcher	2
12.	Rigger	4
13.	Hot Tapping , Line Stop Operator	4
14.	Scaffolder	4
<b>Tentative number of Manpower</b>		<b>38</b>

The responsibilities of each position are as follows:

**1. Project Supervisor / Safety Officer**

Reports to Project Manager

The Project Engineer is responsible for all operational and fiscal aspects of the Project and is empowered to make Project related decisions on behalf of POWERPIPE. He is also an In-charge of performance management of vendors.

He will also be the primary on-site point of contact for the client and be responsible for generating the appropriate documentation including but not limited to the following:

- I. Job specific procedure
- II. Daily Operations Reports
- III. Equipment and personnel time sheets
- IV. Completion certificates
- V. Tool Box Talks
- VI. JSA's

**2. Technician/Operator**

Reports to the Project Engineer

- I. The Operator's responsibilities include the safe and efficient operation of equipment and assisting in the compiling of clear and concise records of operations.

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- II. Pro-actively contributing to the overall site safety by reporting near misses and accidents to the site Project Engineer.

**3. Inservice Welder**


Reports to the Welding Engineer

- I. The welder responsibilities include the safe and efficient inservice welding as per approved WPS in coordination with API-1104.


Refer Annexure

**General Information**

The client reporting and investigating procedure will take precedence in the event of an emergency. However, any incidents involving injury to POWERPIPE personnel, damage to equipment, or high potential "Near Misses" will also be reported through POWERPIPE own reporting system, the Global Crisis Management plan.

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# 4.0 OPERATIONAL REQUIREMENTS

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## 4.1 Pre-Job Safety Meeting & Toolbox talk


Prior to starting operations, the POWERPIPE Project Engineer and the Client Representative will hold a pre-job safety meeting. This meeting shall be attended by all relevant personnel and the forthcoming operations discussed. The following items should also be noted:

- a) All non-essential personnel will be excluded from the operation area.
- b) Heavy lifts are not permitted over POWERPIPE Equipment during Hot Tapping operations.
- c) POWERPIPE and operational personnel have checked the escape routes and made contingency plans.
- d) Adjacent systems shall be configured so that pressure cannot accumulate.
- e) Project Engineers to conduct formal shift handover.
- f) In addition to the above, toolbox talks will be held prior to any task/operation commencement. All personnel involved in operations will attend.
- g) The Project Engineer will brief all operatives in the ensuing operations, risk assessments reviewed and all necessary safety precautions discussed.
- h) Work permits to be signed off accordingly per shift.

## 4.2 System & Equipment Preparation

Pre-mobilisation and post-mobilisation (i.e. all Hot Tap and line stop Equipment along with its related accessories should be tested prior to mobilisation from POWERPIPE work base and on site prior to commencing operations) checks & function tests will be carried out to ensure that the equipment supplied for the project is suitable for the work scope. All equipment will be calibrated and fully certified. In addition, all fittings/connections/adapters on POWERPIPE equipment and PTT owned Equipments will be inspected upon completion of equipment being set up on location.



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PROJECT

METHOD STATEMENT

### 4.3 Method Statement for In-Service Welding, Hot Tapping & Line Stopple Plugging.

#### 4.3.1 General

##### IN-SERVICE WELDING

- There are 2 primary concerns with welding onto in-service pipelines. The first concern is to avoid "burning through" where welding arc causes the pipe wall to be breached. The second concern is for hydrogen cracking, since welds made in-service cool at an accelerated rate as the result of the flowing contents ability to remove heat from the pipe wall
- Burning through is unlikely if the wall thickness is 6.4 mm. or greater, provided that low-hydrogen electrodes (EXX18 type) and normal welding practices are used.
- Electrodes shall conform to AWS A 5.1/AWS class E6016 or E6018 basic coated low-hydrogen electrodes shall be specified in the Welding Procedure Specification.
- Electrodes shall be stored in accordance the Manufacture's instructions in their original containers, which shall be marked with the Manufacture's name, the consumable trade name, and the batch number.

#### 4.3.2 Qualification of Welding Procedures

- Approved Welding Procedure Specification (WPS) & Procedure Qualification Record (PQR) shall be submitted which tested and qualified in accordance with API 1104 Appendix B.

#### 4.3.3 Work preparation of welding and testing of Split tee

➤ Surface cleaning

- Mark the desired location of the hot tap fitting.
- Clean the existing pipe in the area to be inspected to bare metal by mechanical means to remove all coatings, dirt, grease and other contaminants. Necessary precautions need to be taken not to remove the parent metal during cleaning.

➤ Visual inspection & defect check of area to be welded

- The section of the run pipe to which the branch pipe or fitting is to be attached shall be thoroughly cleaned with a wire brush for a distance extending to a minimum of 150 mm either side of the branch or fitting. After cleaning, the run pipe shall be visually examined for laps, cracks, pitting or other form of damage. The fitting shall be located so as to avoid welding on minor flaws in the run pipe.
- Visual examination of non-existence of Pitting and corrosion on the selected area for Hot Tapping

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- Roundness check** For full encirclement tees or sleeves, the run pipe shall be measured with callipers to ensure that ovality is acceptable for accommodation of the proposed tee or sleeve as below picture, ovality of each direction shall not be over 3 mm to avoid gap of split tee and run pipe

POINT	A-B	C-D
CW-1		
MID		
CW-2		

ROUNDNESS RECORD

#### ROUNDNESS MEASUREMENT

- Ultrasonic thickness measurement (UTM).** The specific areas of the run pipe where attachment welds are to be made shall be ultrasonically examination the actual wall thickness for every 40-50 mm intervaly, the minimum actual wall thickness shall be used for heat input calculation

THICKNESS ON LONGITUDINAL

POINT	1	2	3
LW-1			
LW-2			

THICKNESS ON CIRCUMFERENCE


POINT	A	B	C
CW-1			
CW-2			

#### ACTUAL WALL THICKNESS VERIFICATION

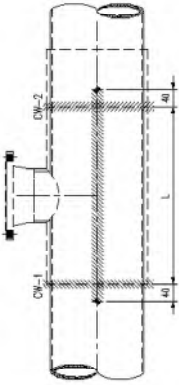
- Radiographic Testing for pipe seam verification**

Existing pipe must be verified for seam position by radiographic test ting (RT). Seam of pipe shall not locate near the pilot drill, distance of pipe seam shall be 2 inch away from edge of pilot drill

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- Ultrasonic Lamination free scan (UTL)**, Ultrasonic examination shall be examined to ensure freedom from lamination



POINT	ACCEPT	UNACCEPT
CW-1		
CW-2		
LW-1		
LW-2		

**LAMINATION FREE SCAN AREA**

**LAMINATION FREE SCAN OF AREA WHERE ATTACH WELDMENT**

➤ **Alignment and welding practices**

**Offset**

- Pre-assembly of fitting on existing pipe shall be verified to ensure the curvature of fitting and pipe surface is within tolerance.
- The offset between the abutting edges for Groove welds should not exceed 1.6 mm. to obtain this alignment, devices should be used, or misaligned surfaces can be built up with weld metal.
- 2 sets of chain blocks shall be used to achieve an offset up to a maximum of 1.6 mm.


**Root Opening**

- The two halves of halves of fitting should be clamped together around the pipe.
- Before the fitting is finally clamped together, Carbon steel backing strips shall be inserted into the machined recesses at the roots of longitudinal welds.
- The backing strip material shall remain within the essential variables of welding procedure qualification.
- The backing strip extension beyond the edges of the fitting shall be a minimum of 150 mm to allow attachment of suitably size run-on /run-off plates.
- Before the fitting is clamped, all visible surface grease in and around the recess of the branch flange, backing strip shall be removed by solvent cleaning.

➤ **Bevels**

- Dye Penetrant Testing shall be performed on the bevels.

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- Immediately prior to welding, the fusion faces and the adjacent material shall be free from planar defects, tears, moisture, scale, rust, paint, grease or other matter.
- Cleaning area shall extend to a minimum of 25 mm from the edge of the fusion faces on both the internal and external surfaces of the fitting.
- Where the fitting thickness is greater than twice the run pipe wall thickness, the fitting shall be chamfered at 45 degree to enable fillet weld leg lengths of two times the run pipe wall thickness, see Figure 5

➤ **Cleaning:**

- Each run of weld metal shall be thoroughly cleaned with hand or power tools before a further run is applied.
- Visible flaws such as cracks, cavities and other deposition faults shall be removed before deposition of further weld metals.

➤ **Fit-up**

- A Yoke-type clamp or chain blocks shall be clamped around the circle of run pipe. Maximum gap between ID of split Tee fitting and OD of the run pipe should be: max 3.2 mm
- Longitudinal groove welds, Max. Gap not exceeds 5 mm. along the longitudinal bevels.
- Circumferential fillet welds Max. Gap not exceeds 1.6 mm. around circle of run pipe.
- Verify that the axial centerline of the Tapping path intersects the axial centerline of the run pipe at right angles.
- Maintain a positive support of the Tapping fitting especially the flange alignment.

➤ **Tack welding:**

- Tack welding is recommended the circumferential should be done on the sequence of opposite side such as 12 o'clock & 6 o'clock, 3 o'clock & 9 o'clock (or equivalent to avoid longitudinal groove ends position)
- Number of Tack welds the longitudinal should be available on qualified welder skill.

➤ **Welding Sequence:**

**a) General**

- Prior to start welding, Customer to confirm that the flow rate of the line being weld shall not be less than 0.4 m/s
- The welding sequence for split tees shall be shown in Figure-1.

**b) Longitudinal groove welds ( LW-1 & LW-2)**

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- Using 2 two welders where the fitting is 750 mm or more in length, weld both longitudinal seams simultaneously. Start the welds from the center of the fitting in opposite directions and progress to the ends.
- Repeat this step, staggering the start/stops, until the seams are 1/3 of the cross-sectional area of the welds.
- Complete the longitudinal seams until full of the cross-sectional of the welds. This can be accomplished using one or two welders, which welding may progress in the desired direction or from one end to the other.

#### c) Circumferential fillet welds (CW-1, CW-2)

- Circumferential welding shall only commence after completion of longitudinal welds.
- Circumferential tack shall be removed after completion of longitudinal welds.
- The welds bead deposition sequence shall be welded as shown in passes sequence of Figure 2
- The second circumferential fillet weld shall only be started after completion and cooling of the first fillet. At no time shall circumferential fillet welds be attempted simultaneously.

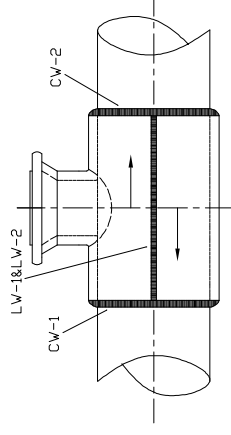
#### d) Buffering for circumferential fillet welds

- Buffering technique shall be used on the run pipe wall as shown in the passes 1 – 3 of Figure 3. Additional reinforcement shall be applied over the buffering layer where the gap between the fitting and run pipe exceeds 1.5 mm, as shown in passes 4-6 of Figure 4.
- The first buffering pass shall be deposited as close as possible to the fitting without impinging or making any attachment to it.
- The fillet leg length and gap between the pipe and fitting shall determine the number buffering passes required. Pass 6 or its equivalent without impinging on the run pipe wall.

#### ➤ Number of welders :

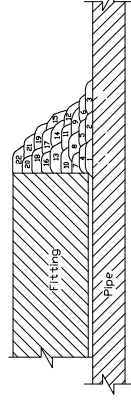
- Longitudinal groove welds where the fitting is 750 mm or more in length, at least 2 welders shall work on each seam (if site condition is applicable).
- Circumferential fillet welds on pipe of 323.9 mm (8 ") OD and larger, 2 welders shall be employed working on the opposite sides of the pipe (if site condition is applicable). At no time shall the welders' weld pools have less than 50 mm separation.

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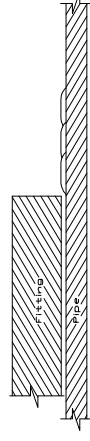


**Figure-1 Encirclement Split Tee fitting Welding sequence**


NOTE: Welding of longitudinal welds to commence in the center of tee. Weld starts shall be overlapped and ground. Welding to continue in this manner until 10 mm to 12 mm in cross sectional thickness is deposited.



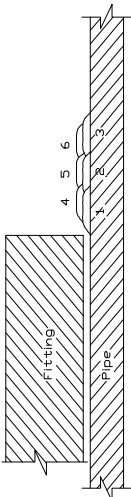
**Figure 2 Weld bead deposition sequence**



**Figure 3 Detail of buffering layer onto pipe**

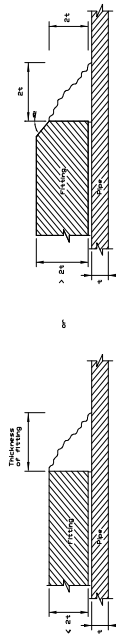
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**Figure 4 Suggest method of reducing gap between pipe and fitting before welding to fillet throat**



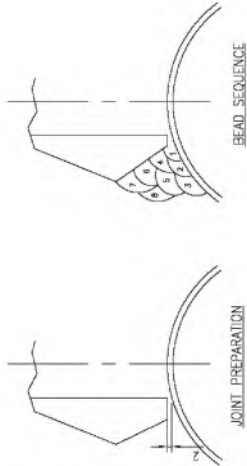
**Figure 5 Dimension of fillet leg length to suit thickness of fitting**


➤ **Alignment and welding practices for O-let fitting**

- Maintain gap between 2-3 mm. for complete joint penetration of root pass
- The welding sequence shall be shown in Figure-6



**Figure 6 : Alignment and welding practices for branch nozzle with O-let fitting**

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#### 4.3.4 INSPECTION AND TESTING

➤ **Visual inspection:**

- All welds shall be inspected by visual inspection during and after welding to ensure that slag is removed between passes.
- Undercutting shall be treated by grinding and blending provided that the specified minimum wall thickness for the pipe and fitting are maintained.

➤ **Non-Destructive Testing:**

- **Root pass :** for both groove weld and fillet weld prior to deposition of further weld metal shall be performed Magnetic Particle Testing on the completed of The root pass
- **Hot pass :** for both groove weld and fillet weld Every layer of hot pass shall be performed Magnetic Particle Testing
- **Finished pass :** The completed assembly welds shall be magnetic particle inspected not sooner than 24 hours after completion of the joint.

➤ **Sequence of weld Beads Inspection Testing Table**  
Groove Weld No. LW1 / LW2 (Longitudinal Weld)

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X		X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	



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#### Circumferential Weld / Fillet weld

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No.	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X	-	X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	MT Delay crack

#### ➤ Strength Test Pressures:

- The test pressure will depend on the actual internal pressure of the run pipe at the time of the hot-top and the ability of the run pipe to withstand external pressure.

#### ➤ Pressure Test:

- For split tees, the maximum allowable pressure differential ( $\Delta P$ ) with respect to buckling of the run-pipe calculated as defined in ASME VIII, Division 1, Section UG-28.
- Therefore  $PT = PA + \Delta P$   
Where PT = test pressure And PA = actual operating pressure in the run-pipe

#### ➤ Testing Media:

- Where practical, the testing medium shall be water. In some applications where it is desirable to avoid water in the split-tee annulus, the use of liquid hydrocarbons may be suitable, subject to acceptable safety precautions. For the condition of operating temperature higher than 100 C, hot oil shall be used for testing.

#### ➤ Testing Duration:

- Testing of branch connection, with the valve installed and in the open position, to demonstrate leak tightness and strength. Duration should be at least 15 minutes.

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#### 1. Welding Hot Tap, Line Stop Fittings and its Accessory Fittings into 24" Header Line.



- Experienced In-service welders qualified should be deployed to execute the welding of fittings.
- Pipe line should be exposed and all painting should be removed at Marked location where Hot Tapping Operation need to be carried out.
- Thickness survey and Ultrasonic Lamination Check of the pipeline areas where Hot Tap Fitting to be welded will be conducted by a certified testing agency.
- UTL reports will be reviewed by the PTT Representative and Approval/permit for taking up the welding activities will be issued by the same.
- One number of **24"x20"x300# Hot Tap Fitting along with Surelock Flange and 20" x 300# Full Bore Gate Valve (9 clock)** , **24"x24"x300# Line Stopple Fitting (12 clock)**, **24"x2"x300# TOR Fitting (12 clock)** , **24"x4"x300# Vent Fitting (12 clock)** is welded where UTL is carried at Upstream and Downstream Locations.
- All welding shall be as per API 1104 Appendix B.**
- A Minimum flow shall be maintained during welding to dissipate the generated heat during welding.
- At No-Flow condition the cooling rate of each weld bead is noted and its ensured that there won't be any temperature buildup in the weld area. Once after confirming the same the welding activities are proceeded.
- Branch Pipe is welded first, and then the Reinforcement pad is welded.
- Temperature of weld areas are regularly noted using calibrated Temperature Measuring instrument.

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- Non-destructive tests (NDT) shall be done, during and after welding as specified in the approved WPS.

## 2. Sandwich Valve / Isolation Valve Installation



- 24"X 300 # Sandwich Valves are installed upon the Line Stop fittings.
- 2"X 300 # Ball Valves are installed upon the Pressure Equalization fittings.
- 4"X 300 # gate Valves are installed upon the Vent fittings.
- It's made sure that the valves are full bore and 100 % open.

## 3. Hot Tapping Operation and Installation of Permanent Bypass Line



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### 3.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot Tap Data Sheet to be furnished by Customer .
- Pressure testing of Hot-tapping machine.

### 3.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or international; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre tested ANSI class FULL BORE ID gate valves furnished by Contractor or Owner
- Demonstrate of hot tap equipment to customer satisfactory

### 3.3 Remove blind flange.

- Check raised face of the Hot Tap Fitting Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.


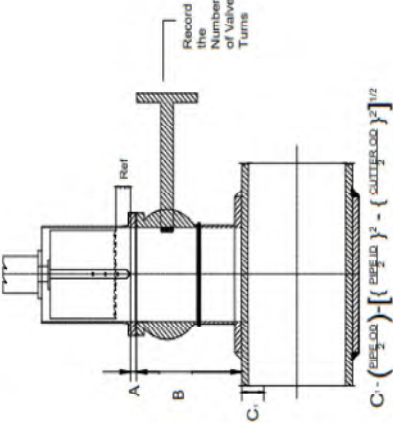
### 3.4 Clean valve faces & Install Full bore ID Tapping Valve:

- Install new gasket on all connection
- Lower valve into the fitting slowly, keeping stud free in flange bolt holes,
- Open Tapping valve and align bore of valve with bore of the fitting as near perfect has possible.
- Install studs & nuts and tighten evenly using the proper sequence
- Take required Tapping measurement

### 3.5 Check Tapping Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.

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<ul style="list-style-type: none"><li>Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.</li><li>Measure valve for sufficient housing space for cutter and pilot. Face of valve to seat rings. Record this dimension.</li></ul>				
<b>3.6 ASSEMBLE THE TAPPING MACHINE:</b>				
<ul style="list-style-type: none"><li>Check boring bar drive ring for tightness and damage.</li><li>Check the retainer shaft packing nut. Packing nut must not extend out onto the taper of the boring bar.</li><li>Clean ring joints and steel ring gasket.</li><li>Install adapter on tapping machine adapter and snug the top two bolts, leaving others loose.</li><li>Extends the boring bar beyond the face of the adapter. Install the cutter holder in the boring bar. Tighten the retainer shaft with the measuring rod. Install the safety pin with cotter pins on both ends.</li><li>Check cutter teeth and outer diameter of the cutter, install cutter on cutter holder and tighten the socket head bolts and lock nuts. An acceptable alternative is to assemble the cutter and the cutter holder before installing the cutter holder in the boring bar.</li><li>Check the U-roads, pilot drill, and nylon lock pin in pilot. Then install pilot in the cutter holder and tighten.</li><li>Align the adapter with the cutter and tighten adapter bolts. For alignment reference, measure from the outer diameter of the cutter to the outer diameter of the flange raised face. Rotate the cutter 180 degree and recheck the alignment. If alignment changes when the cutter is rotated check the cutter, cutter holder, and boring bar for damage.</li><li>Refract the boring bar and cutter all the way. Take measurement with the measuring rod.</li></ul>				
<b>3.7 CALCULATE THE TAPPING DISTANCE:</b>				
<ul style="list-style-type: none"><li>Measure the distance from the pilot tip to the face of the adapter (Measurement A).</li><li>Measure distance from top of the valve to the top of the pipe wall (Measurement B).</li><li>Calculate distance the pilot and the cutter must travel to complete the tap after the pilot contacts the pipe wall (Measurement C).</li><li>If the pilot is inside the adapter , total of A+B equals the distance the pilot must travel to contact the pipe.</li><li>If the pilot tip extends beyond the face of the adapter, total of B-A equals the distance the pilot must travel to contact the pipe wall.</li><li>Measure the distance the pilot tip extends beyond the cutter teeth.</li></ul>				

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Date																				
<div><div><b>Hot Tapping Measurement Card for 24"x20"</b></div><div><div>Header Pipe OD : .....</div><div>Branch Size : .....</div><div>Pipeline Thk : .....</div><div>Cutter OD : .....</div></div><div>Date : .....</div></div> <div><div><math display="block">C = \left( \frac{PIPE OD}{2} \right) - \left\{ \left( \frac{PIPE ID}{2} \right)^2 - \left( \frac{CUTTER OD}{2} \right)^2 \right\}^{1/2}</math></div><table border="1"><tr><td>A Pilot to Face of Adapter</td><td></td></tr><tr><td>+B Top of the Valve to Top of the Pipe</td><td></td></tr><tr><td>= Lower-In Distance</td><td></td></tr><tr><td>Ref, Pilot to Cutter</td><td></td></tr><tr><td>C, Tapping Distance from Calculation</td><td></td></tr><tr><td>C C+ Ref</td><td></td></tr><tr><td>Total Travel . Lower-In +C</td><td></td></tr><tr><td>Max. Tapping Distance</td><td></td></tr></table><div>Max. Tapping Distance = Lower-In Distance + <math>\left( \frac{PIPE OD}{2} \right) - Ref1 + 18"</math></div></div>					A Pilot to Face of Adapter		+B Top of the Valve to Top of the Pipe		= Lower-In Distance		Ref, Pilot to Cutter		C, Tapping Distance from Calculation		C C+ Ref		Total Travel . Lower-In +C		Max. Tapping Distance	
A Pilot to Face of Adapter																				
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Total Travel . Lower-In +C																				
Max. Tapping Distance																				

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### Hot Tapping Measurement Card for 24"x24"

Date : .....

Header Pipe OD : .....  
 Branch Size : .....  
 Pipeline Thk : .....  
 Cutter OD : .....

$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{ID}}{2} \right)^2 - \left( \frac{CUTTER_{OD}}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel . Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + Ref + 1/8"$

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### Hot Tapping Measurement Card for 24"x2"

Date : .....

Header Pipe OD : .....  
 Branch Size : .....  
 Pipeline Thk : .....  
 Drill Bit Dia : .....


$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{ID}}{2} \right)^2 - \left( \frac{DRILL_{OD}}{2} \right)^2 \right]^{1/2}$$

A Top of the Valve to Top of the Pipe	
= Lower-in Distance	
C <sub>1</sub> Tapping Distance from Calculation	
Total Travel . Lowe-in +C <sub>1</sub>	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + 1/8"$



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### Hot Tapping Measurement Card for 24"x 4"

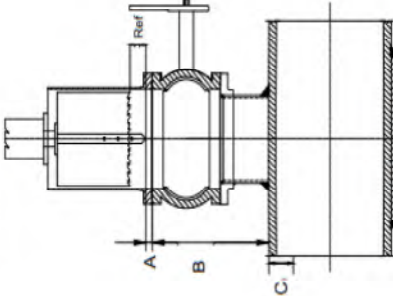
Header Pipe OD : .....

Branch Size : .....

Pipeline Thk : .....

Cutter OD : .....

Date : .....



$$C = \left( \frac{PIPE OD}{2} \right) \left[ \left( \frac{PIPE OD}{2} \right)^2 - \left( \frac{CUTTER OD}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C, Tapping Distance from Calculation	
C C, Ref	
Total Travel, Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE OD}{2} \right) + Ref + 1/8"$

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### 3.8 Install Tapping Machine on the Tapping Valve.

- Align bolt holes on the flanges.
- Install bolts and tighten evenly.
- Install bleeder valve and leave it open.

### 3.9 Perform leak test of machine assembly & Operational check

- Pack Nitrogen into machine set-up to displace any possible pressure of air in between tapping machine, adaptor, valve and fitting and pressure test (Leak Test) assembly to customer specification to ensure bubble tight seal on all bolted connections prior to any hot tapping.

### 3.10 Hot Tapping Operation -

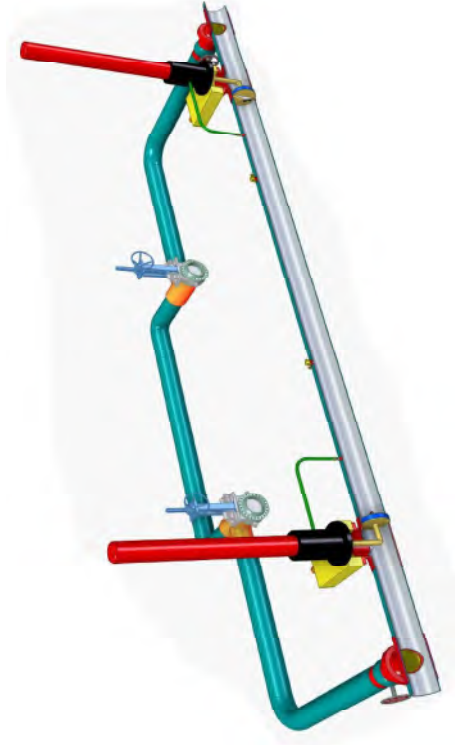
- Take all the required measurements, record them on measurement card and mark the same on measuring rod.
- Calculate the cutting distance and time required for cutting.
- Re-check number of 'U' rods coming under the span of calculated cutting distance.
- Re-check that boring bar is fully retracted.
- Assemble the Hot tapping machine on the Gate Valve.
- Close the isolation valve (Count and record the number of turns).
- Check for alignment in all directions and tighten the bolts.
- Open the isolation Valves (Count and record the number of turns).
- Open the bleeder valve and ON the nitrogen supply.
- After few minutes, CLOSE the bleeder valve and raise the pressure as required by test norms **(Generally 1.1 times the working pressure).**
- Leave the set-up pressurized for 15 minutes; Check all flange and threaded joints for any leakage using soap solution or any other approved method.
- LOWER-IN the boring bar manually as per measurement (By turning the crank handle clockwise) fill you feel that Pilot drill has touched the top of the pipe, and cross check with measuring rod.
- Retract the boring bar 3 to 4 turns (turn anticlockwise).
- Engage the power source with machine drive.
- Open the Tapping machine control valve.
- Complete the pilot drill (According to measuring rod), also can be verified by checking the rise or drop in pressure gauge fitted.
- Once the pilot is complete, Close the machine control. Disengage the machine from power source and drive the boring bar manually fill the cutter touches the top of the pipe (check the marked indications on measuring rod) also can be re-checked by one's feel.
- Retract 3 to 4 turns and engage the power source with machine drive, Open the Tapping machine control valve.

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- Complete the tapping (According to measuring rod).
- Once the Tapping is complete, close the machine control, Disengage the machine from power source and drive the boring bar manually for 1/8".
- Just open the machine control and rotate the boring bar (Cutter) without engaging the clutch for few minutes to ensure that coupon is free.
- Close the machine control, OFF the power source.
- Retract the boring bar manually till initial reading (marked on measuring rod).
- Close the isolation valve (cross check the 100% closing by counting the number of turns); open the bleeder valve to drain out the product remaining in the machine housing.
- Once draining is complete, remove the Hot tapping machine and handover the coupon to PTT.
- Install Flow through Guide Bar on 24"x 20"x 300# Hot Tap Fitting at Upstream and Downstream Locations.
- Cut the 20"WNRF Flange from the Hot Tap Fitting and Weld the New Permanent Bypass line (**Hydrotested**) at Upstream and Downstream Locations.
- Above Procedure is to be repeated for carrying Hot Tapping on 24"x24"x300# , 24"x2"x300# , 24"x4"x300# Fittings.

#### 4. LINE STOP PROCEDURE



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#### 4.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer
- Pressure testing of Hot-Tapping/Line Stop machine.

#### 4.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or international; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre-tested ANSI class full bore valves

#### 4.3 Remove blind flange.

- Check raised face of the Line Stop Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.

#### 4.4 Check isolation Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Assembly line stop machine with plugging head
- Customer to confirm the velocity in line prior to line plugging.
- Install Line Stop Machine on Sandwich valve , Pressure Equalization need to be carried out using 2" TOR Fitting .
- After the Pressure is equalized ,Open the Sandwich Valve Gate.
- Set plugging head into the line.( **Always Downstream Plug to be set first.**)

NOTE: Pressure, flow rate, velocity will be considerations to look into and discuss/verify with the customer prior to job commencement.

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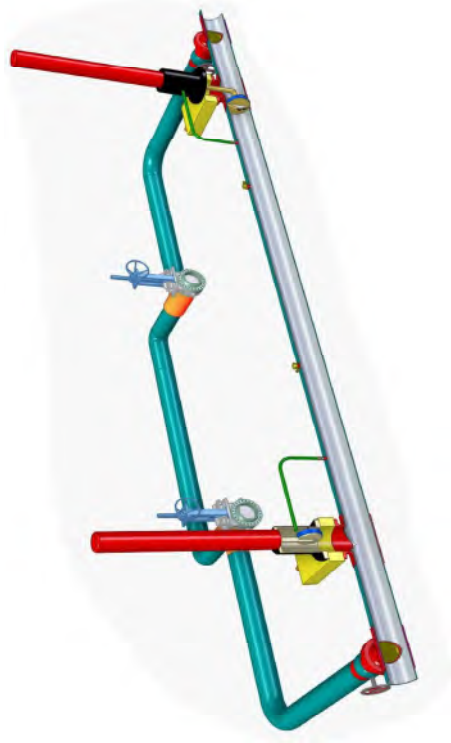


Fig. Insertion of Downstream Stopple Plug into Pipeline.

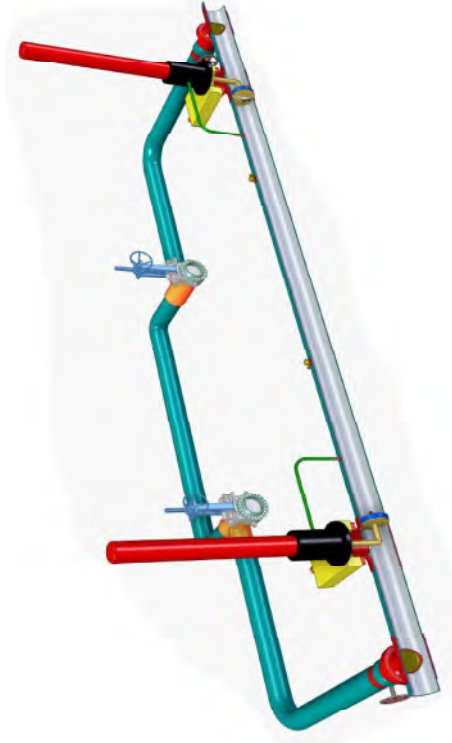


Fig. Insertion of Upstream Stopple Plug into Pipeline.

#### 4.5 Relieve pressure in isolated section and check for seal integrity.

- After plugging machine is set, close the 2" Pressure equalization valves , Dismantle the Hose.
- Isolate the Section using 4" weld-olet fitting.

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- The Stopple Seal Integrity can be verified during this stage using Pressure Gauges .
- Monitoring pressure at downstream portion for 0.5 hours, if there is no pressure built up customer is able to perform pipeline modification works.
- Dead setion is subjected to Nitrogen Purging , then Cold Cutting is carried out.

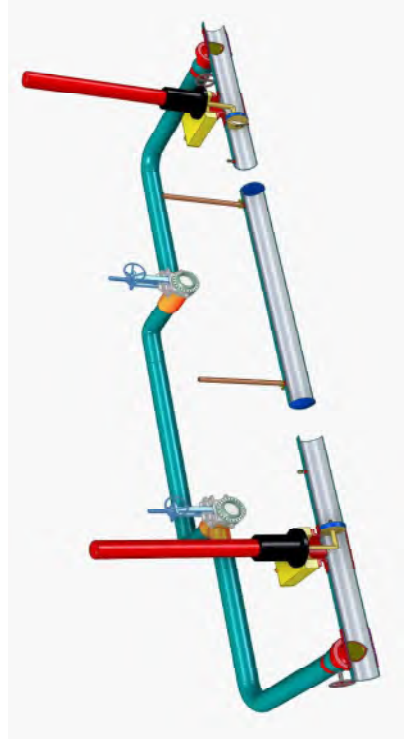


Fig. Venting of Service using 4" Vent Connection and then Cold-Cutting of Header Pipe and Welding of Dish Ends into the Dead Section.

#### 4.6 Proceed to Remedial work & Re-Commissioning of 24" Header Line.

- Gas Check
- N2 purging if required
- Cutting undesired portion.
- Welding of 5D bends into Existing 24" Header line & golden joints are subjected for Radiographic examination at Upstream and Downstream Location.
- After the Successful NDE results , the Header line is re-commissioned using 2" TOR Fitting.

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Fig. Welding of 24" 5D Bends into Header line




Fig. Re-Commissioning of Header line using 2" TOR Fitting

**4.7 Stopple Plug Retrieval and Dismantling of Stopple Assembly.**

- After pressure equalization, Upstream Stopple Plug is retracted first , then Downstream Stopple is retracted.
- Close the 24"Sandwich Valves and 2" Equalization valves .
- Open bleeder valve to relieve trapped pressure in Stopple Housing . Dismantle the Stopple Housing Assembly.

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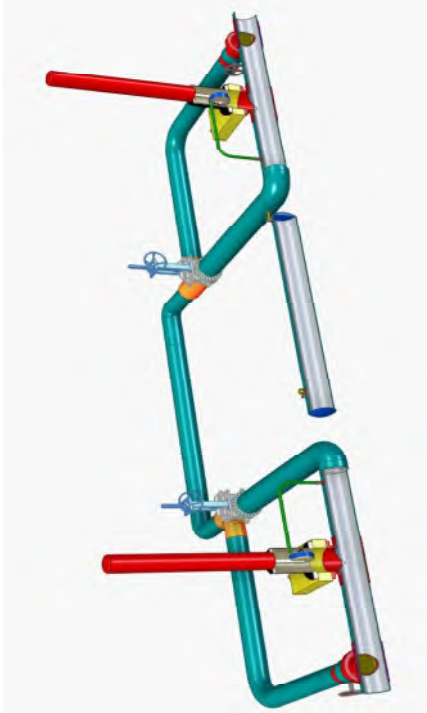


Fig. Stopple Plug Retraction

**4.8 Temporary and Permanent Line Blinding.**

- Check OD of plugs.
- Install plug and plug holder to tapping machine.
- Clean, check for damage and lubricate.
- Install the tapping machine on Sandwich Valve , Equalize the Pressure , below and above the Sandwich Valve Gate.
- Open the 24"Sandwich valve.
- Extend to insert special LOR Plug ( completion Plug with Coupon welded ) into set position, engage segments in LOR flange and fully retract boring bar.
- After the completion Plug is installed , Release the trapped pressure in the adaptor using bleeder valve , and check for any pressure build up above the completion plug.
- Once no pressure build up found , Dismantle the Tapping machine assembly and 24" Split-Tee are permanently blinded by installing BLRF Flangesat Upstream and Downstream Locations.
- 2" TOR is temporarily blinded with Brass plugs and Permanently blinded with end caps tack welded.






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## 1 INTRODUCTION

### 1.1 General information

This document covers the safe working practices for the execution of Hot Tapping and Line Stopple Plugging operation Including In-service welding works.


It is the responsibility of POWERPIPE project execution team and shall be adhered to all personnel involved with the operation.

The purpose of the project is to "RE-ROUTE PTT PIPELINE HSR 4-2".

### 1.2 Abbreviations and Definitions

Terms	Definition
Ps(a)/Ps(g)	Pressure in Psi, absolute and gauge
Owner/Client	PTT
Main Contractor	Siamraj PCL
Hot tap Contractor	POWERPIPE CO., LTD.
HSE	Health, Safety, and Environment
JSA	Job Safety Analysis
m.	meter
m3	Cubic meter
MSDS	Material Safety Data Sheet
N/A	Not applicable
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PSV/PRV	Pressure Safety Valve/Pressure Relief Valve.
PTW	Permit to Work System
Rev	Revision
Scf.	Standard Cubic Foot
FIM	Free Issue Material



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#### Project Re-route PTT pipeline HSR 4-2

**Flammable Service**  
A fluid which, under expected operating conditions, is a vapour or produces vapours that can be ignited and continue to burn in air

**Hazardous Substance**  
Included, but not limited to, those substances that are explosive, combustible, toxic or corrosive

**Hot Tapping**  
The technique of attaching a mechanical or welded branch fitting to piping or equipment by drilling or cutting an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting.

**Gate Valve**  
A gate valve, also known as a sluice valve, is a valve that opens by lifting a barrier (gate) out of the path of the fluid. Gate valves require very little space along the pipe axis and hardly restrict the flow of fluid when the gate is fully opened. The gate faces can be parallel but are most commonly wedge-shaped (in order to be able to apply pressure on the sealing surface)

**Manufacturer/Vendor**  
The party which manufactures and/or supplies equipment, technical documents/drawings and services to perform the duties specified by the POWERPIPE

**On-Plot Piping**  
Pipe system designed in accordance with ASME B31.1, ASME B31.3 (see Note below)

**NOTE:** Some parts of a pipeline system, although located "off-plot", may be designed in accordance with ASME B31.3. For the purposes of this specification, such piping shall be considered to be On-plot. Similarly, some refinery piping, although physically located "on-plot", may be designed in accordance with ASME B31.4 or B31.8. For the purposes of this specification, such piping shall be considered to be Off-plot

**Operating Conditions**  
All conditions of piping and equipment when containing hydrocarbons under a positive internal pressure

**Run-Pipe**  
The existing pipe into which a Hot-Tap is to be made


**Shall**  
Indicates a mandatory requirement

**Should**  
Indicates a strong recommendation

**Site**  
Any place where the facilities will be reinstated, constructed and/or installed

#### 1.3 Pipeline Data Sheet

Main Pipeline Size 24 Inch  
Wall Thickness 0.688"  
Pipeline Material Carbon Steel

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Orientation Of Pipe Horizontal

Service Fluid Natural Gas

Design Pressure 720 Psi

Operating Pressure ( Max/Min) 460 Psi

Design Temperature 176 Deg. Far.

Operating Temperature 77 Deg. Far.

Branch Size for Hot Tapping 20 Inch

Branch Size for Line Stopple Plugging 24 Inch

Orientation of Tap 12 - 0' clock position

Valve Type 24" X 300 # Sandwich Valve , 24" X 300# Full Bore ball Valve.

Fitting Type Fully Enciclement Split Tee


#### 1.4 Communications

Throughout the Project communications should be maintained between POWERPIPE Operations Manager and PTT, EIC. If communications fail at any given time, the operation shall cease until communications are re-established.

#### 1.5 References

1. API RP 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries
2. API 1104 Welding of Pipelines and Related Facilities
3. ASME B31.8 Process Piping
4. ASME B16.5 Steel Pipe Flanges & Flanged Fittings
5. ASTM A106 Standard Specifications for Seamless Carbon Steel Pipelines
6. API 5L Specification for line pipe.
7. ASME B 16.25 : But Welding Ends.
8. MSS-SP44 Steel pipeline flanges
9. ASME Sec.VIII : Boiler & Pressure Vessels Code-Rules for the construction of pressure.
10. ASME Sec. V: Non-destructive examination.
11. ASME Sec. IX: Welding.
12. ASME Sec. VIII Div.1 & 2: Fabrication.
13. ASTM A694: carbon and alloy steel forgings for pipe flanges, fittings, valves, and parts for high pressure transmission service.




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## 2 SCOPE OF WORK

This document gives the detailed requirement to be covered the task as listed below:

- Existing pipe wall thickness check (See PAE-UTM-008)
- U.T. Lamination checking of pipeline (See PAE-UT-004)
- Pipe seam verification (See PAE-RT-001)
- Roundness checking
- Fitting installation
- Welding
- Inspection and testing
- Hot tap operation
- Line stop Operation
- Pipeline modification
- Completion plug installation

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## 3 HEALTH, SAFETY & ENVIRONMENT

A copy of the POWERPIPE Health, Safety and Environmental Management Systems Manual will be kept on site and is available for review by PTT.

The standards and safe working practices outlined in this document will be adopted and referred to throughout POWERPIPE operations on site.

All work will be carried out in accordance with the PTT and the POWERPIPE QHSE Plan.

Every day recording of the manpower available at site before start of the work to be carried out.

### 3.1 HSE Considerations

Safety is the responsibility of every employee irrespective of status. Employees will ensure that their workplace is safe and functions efficiently and safely. Common sense should be applied for 'safe working' practices to be implemented and adhered to at all times. Particular attention will be given to work site safety and to any safety systems and procedures provided. POWERPIPE to complete any Client site specific safety training and site orientation prior to commencing site activities.

Personal Protective Equipment (PPE) will be issued to all personnel. The minimum PPE of hard hat, safety boots, full length coveralls, gloves and eye protection will be worn at all times when working on site.

Barriers will be erected in order to ensure that unauthorised personnel do not enter the worksite, and tannoy announcements will be broadcast to warn personnel of any operations that require the worksite to be barred off.

All Hot tap and line stop equipments along with its accessories will be checked to confirm that they are of a suitable pressure rating for the task. All air hoses will and be secured with whip-checks & R-pins.

On completion of the work scope, and prior to demobilisation, any equipment which is damaged or faulty will be clearly red tagged and an equipment damage report will be completed.

Any equipment which may contain residual chemicals will be clearly tagged, and the base will be made aware of these items prior to the items being demobilised.

### 3.2 Safety Systems

The worksite Permit-to-Work system will be implemented and strictly adhered to at all times. No work will be carried out unless the required Permit has been raised, authorised and signed on. If the scope of work changes during the duration of the Permit, the POWERPIPE Project Engineer will ensure that any changes to the work are discussed with (Company and Client), and the permit modified (if necessary) and re-issued.

Prior to operations commencing, a Pre-Job Safety Meeting will be held to ensure that all parties involved in, or affected by, the work are aware of its nature and of the hazards involved. The meeting will be held on site and recorded on the Pre-Job Safety Meeting Form. Any outstanding actions following the meeting will be closed out prior to operations commencing.


Any employee shall have the right to stop operations for discussion if he/she feels that there is a breach of safety procedures, or if an unsafe act is taking place.

### 3.3 Site Induction and Permit to Work

All POWERPIPE operational personnel must have attended the PTT site safety induction course prior to commencement of operations. The POWERPIPE Project Engineer will brief personnel on the operational requirements, site hazards and relevant safety issues.





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All works must be carried out in accordance with the client safe working procedure. Job Risk Analysis is to be prepared and approved by client HSE before starting work.

### 3.4 Pre-Job Safety Meetings and Toolbox Talks

- I. The POWERPIPE Project Engineer immediately prior to commencement of operation will hold a Pre-Job Safety Meeting on site. All personnel involved in flushing operations should be in attendance.
- II. The meeting will cover all job and site related hazards, safety controls in place, contingency plans in the event of emergencies and any other points deemed relevant. Any questions or queries should be raised at the meeting. Minutes of the meeting will be recorded on a POWERPIPE Pre-Job Safety Meeting Form.
- III. The POWERPIPE Project Engineer will conduct Toolbox talks before each new task/operation is undertaken, which will be recorded on the appropriate form. The purpose of the talks is to inform the POWERPIPE Crew of any potential hazards, safe working practices to be adopted and contingency plans in the event of an incident/accident. Client or third party personnel affected by the works are invited to attend.

### 3.5 Hot Tapping Operation.

- i. During Hot Tapping operation the surrounding area around-off point will be access restricted by use of barricade safety tape at a distance 10 meters from the tapping point. In addition to this danger signs shall be located in a sufficient distance around the area to warn the personnel of the activity.
- ii. Ensure all the surrounding area is cleaned and all loose construction materials is removed, access to the restricted area shall only be permitted by the supervision.
- iii. Ensure that the surrounding equipment are properly protected from the loose and unwanted materials from the blow off point.
- iv. Ensure all the required personnel protective equipment such as ear plugs, gloves, safety glasses etc. are to be provided and worn by all the personnel involved in the operation.


### 3.6 Near Miss / Incident / Accident Reporting

- i. It is the policy that all accidents, incidents or near misses involving POWERPIPE personnel, equipment, property, or affecting third parties, must be reported without exception. This includes the operations and employees of companies subcontracted by POWERPIPE Services.
- ii. All employees must be aware of these requirements and of their duty to recognize and report any occurrence, which comes within the terms of the POWERPIPE and relevant Client Accident reporting system. POWERPIPE Project Engineer shall satisfy himself that all personnel under his control are aware of this requirement and shall periodically check this fact.

### 3.7 Emergency Response Plan

Following are the major emergency incidents that might occur at site.

- i. Fire / Explosion.
- ii. Injury due to lifting operation, fire, electrocution, civil unrest, Natural disaster, Medical also.
- iii. Toxication.

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- iv. Objects falling from height, sliding, moving parts, drowning, etc.
- v. The possibility of such an emergency occurring although is very less, the company has the requisite preparedness in such an eventuality.

### FIRE/EXPLOSION LEADING TO EVACUATION:

- I. Fire or explosion that has occurred at site and which is out of control and no longer localized to that section only shall be called as an 'EMERGENCY'. It is left to the discretion of the personnel at site of incident whether to call for an emergency or not.
- II. Emergency will be activated by any of these means – over the phone or by word of mouth or by shouts or using emergency siren. On activation of the emergency at the site, all those present at the work location including Technicians, supervisors, coordinator, helpers shall assemble at the Assembly Point and immediately report to their respective seniors as planned.
- III. The Assembly Point of the Industry or site is the open space present in front of the security room/ where it is safe.
- IV. The Engineer in charge shall report the head-count and the presence of their respective personnel and that of the Technician, supervisor who were under their control. The Manager or his designate who is the head-count man shall be the Site Incident Controller. He shall first ensure that the working area has been completely evacuated.
- V. Site Incident Controller will assume full control of the administrative aspect of the emergency. He shall dictate the immediate action to be taken at the Scene of incident. He shall guide the assembled people on further course of action.

The First Line Emergency Fighters' Team includes the following persons


Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Hider		

Note:

- I. During an emergency always ensure that you do not panic or give any scope for confusion or chaos.
- II. Do not spread rumors or gossips.
- III. All shall adhere to the instructions delivered by the Site Incident Controller.
- IV. Make way for the emergency fighting resources to reach the source of incident.

### TOXICATION:



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Many chemicals found in the pipeline/work place have a harmful effect on humans. These chemicals may enter the body through skin absorption, through respiratory or elementary systems. Harmful effects may become apparent immediately or in the short / long term. In case of emergencies where gases enter the atmosphere is a critical area, as volumes of dangerous impurities are difficult to measure. It is therefore essential to that detection of any traces of dangerous gases above the Threshold Limit Value (T.L.V) and take the necessary safety precautions.

Special attention is drawn to the possible presence of extremely poisonous substances.

#### INJURY WHILE WORKING, FALL FROM HEIGHT/OBJECTS FALLING FROM HEIGHT

While working at a height or while working/ walking near the site of works the possibility of fall from height or objects falling down is present and injury while working.

When you find someone being injured while working or by fall or by an object falling from a height.

- Immediately isolate the person from the source of injury ensuring that further danger or severity is arrested.

- Call for qualified assistance.

- Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.


#### EMERGENCY NUMBERS AND TRAINED FIRST AIDERS

EMERGENCY PHONE NUMBERS:(IN HOUSE)
Anywhere in India (Toll free)
FIRE – 101
AMBULANCE – 102/108
POLICE – 100
PROJECT INCHARGE –
HSE OFFICER –
HOSPITAL –
AT PLANT
FIRE STATION – FIRE
MEDICAL-
SECURITY -

#### TRAINED FIRST AIDERS AND FIRE FIGHTERS

NAME	DESIGNATION

#### CIVIL UNREST

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- Civil unrest, is an activity arising from a mass act of civil disobedience (such as a demonstration, riot, or strike) in which the participants become hostile toward authority, and authorities incur difficulties in maintaining public safety and order, over the disorderly crowd. It is, in any form, prejudicial to public law and order.
- Familiarize yourself with the route, site set-up, and range of exits, help & security points.
- know alternative routes on different modes of transport
- calculate plenty of time, set out early
- agree on a plan should you get separated while in a crowd
- plan for an agree on potential emergency scenarios should you get hurt
- Carry some minimal items on your person: pocket first aid including burns, marker pen, tape, water etc.
- Be identifiable, have emergency contacts cards on person.
- comply as instructed by public safety and health agencies and their reps
- assist others if you can to help reduce potential congestion, disorder or panic but always consider your own safety - keep alert and focused, rest often, keep hydrated
- Save your phone battery life: text rather than call, turn screen brightness low, keep essential calls short but keep your family friends & colleagues updated. Let them know you are safe
- Redundancy: helmets and other recreational gear can double as personal protection in extreme conditions.

#### MEDICAL EMERGENCY

- A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies such as cardiovascular (heart), respiratory, and gastrointestinal cannot be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from first aiders through Emergency Medical technicians, paramedics, emergency physicians and anesthesiologists.
- Stop Work: Abandon any plant, equipment or area immediately if a medical emergency occurs
- Assess the Risk: Check for Danger. Secure the area and Raise the Alarm what is the cause of the medical issue? Is it related to the work currently being performed? Has the patient been exposed to a dangerous environment (e.g. electricity, vehicle incident, fall from height) or is it due to personal health issues (e.g. heart attack, stroke).your priority should be to keep yourself and others safe. Decide if you are competent to manage the incident.

- Notify: Report the incident to the site in charge immediately. They may take responsibility for managing the incident. If they are not available, contact Health, Safety, and Environment & Quality



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(SHEQ) Officer. If necessary, any people not involved in managing the incident should proceed to the emergency assembly area at the entrance of the site. As required, The Facility Manager or SHEQ will contact the relevant authorities immediately: Fire, Ambulance or Police. External authorities may take control of emergency response at the site.

- V. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### NATURAL DISASTER

A natural disaster is a major adverse event resulting from natural processes of the Earth like:., floods, hurricanes, tornadoes, volcaniceruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover and also on the infrastructure available.

#### Tornado:

- I. Small interior rooms on the lowest floor and without windows.
- II. Hallways on the lowest floor away from doors and windows.
- III. Rooms constructed with reinforced concrete, brick, or block with no windows.
- IV. Stay away from outside walls and windows.
- V. Use arms to protect head and neck.
- VI. Remain sheltered until the tornado threat is announced to be over.

#### Earthquake:

- I. Stay calm and await instructions from the Emergency Coordinator or the designated official.
- II. Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- III. Evacuate as instructed by the Emergency Coordinator and/or the designated official.

#### Flood: If indoors:


Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official. Follow the recommended primary or secondary evacuation routes.

#### Flood: If outdoors:

- I. Climb to high ground and stay there.
- II. Avoid walking or driving through flood water.
- III. If car stalls, abandon it immediately and climb to a higher ground.

#### Hurricane:



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- I. The nature of a hurricane provides for more warning than other natural and weather disasters.
- II. A hurricane watch issued when a hurricane becomes a threat to a coastal area.
- III. Once a hurricane watch has been issued: Stay calm and await instructions from the Emergency Coordinator or the designated official.
- IV. Moor any boats securely, or move to a safe place if time allows.
- V. Continue to monitor local TV and radio stations for instructions.
- VI. Move early out of low-lying areas or from the coast, at the request of officials.
- VII. If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- VIII. Collect drinking water in appropriate containers.
- IX. Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- X. Leave areas that might be affected by storm tide or stream flooding.

#### COMMUNICATION

- I. All communication to be through site in charge and External communication will be done by Corrttech to media or anyother.
- II. The main channel of communication between the command center and incident command post is via telephone/ shouting.
- III. All-important contact telephone numbers, e.g. Government agencies, external bodies are displayed near the assembly point point.
- IV. The security guard is responsible for taking the head count, in coordination with the hseq department.

#### EMERGENCY TEAM


The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

#### MOCK DRILLS

Regular mock drill shall be conducted as per approved emergency plan at all the above stations. Deficiencies identified & corrective action taken shall be documented. In addition to the mock drills



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conducted by PTT. POWERPIPE with PTT combined mock drills shall be organized once in two months to test the efficacy of response in emergency situations. Performance & findings of combined emergency drills shall be shared & documented between the organizations to sustain emergency preparedness at the highest level.

- I. Inform all the employees about mock drill.
- II. Fix the date for mock drill.
- III. Observers will not be involved in the exercise. They will monitor the Mock drill.
- IV. Emergency Siren / alarm will be raised.
- V. After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in above.
- VI. Observer will note down the activities with respect to the time.

### 3.8 Shift Handovers(If applicable)

At every shift change there shall be a time period solely dedicated for the purpose of exchanging a written and a verbal account of the previous shift's operations. It is the responsibility of the POWERPIPE Project Engineer and POWERPIPE Shift Project Engineer to ensure that there is a complete exchange of all information sufficient to allow the "oncoming" crew to safely and competently continue with the operations. The shift handover period should include [when appropriate] a complete "walk through" of the systems under test in order to identify strategic areas or points.

### 3.9 POWERPIPE QHSE representative

POWERPIPE project engineer shall act as POWERPIPE site QHSE representative. He shall be responsible for the overall supervision and safety of all POWERPIPE personnel on site (acting POWERPIPE site 'Health, Safety and Environmental Representative'), and will ensure all work activities undertaken are in accordance with Client / POWERPIPE approved work procedures, safe working practices and Permit to Work systems (if applicable).

### 3.10 Risk assessments

A Toolbox Safety Talk will be conducted on site before each new job task or section of a job procedure. All personnel participating in the works will attend, with details of the work, the hazards and the precautions being discussed. Where shift work is in operation, the Toolbox Safety Talk will be given to personnel on both shifts. The talk(s) will be logged in the Daily Operations Report.


Any changes to the scope of work must be risk assessed. Prior to implementation, the changes must be reviewed and accepted by both POWERPIPE and client.

HSE Risk Assessments identify Hazards and the degree of Risk that they pose. Assessments are carried out to indicate the control measures (safety equipment, work procedures, isolation methods, training and communication) required to reduce Risk to an acceptable level. Assessments must be carried out and approved prior to work commencing.

The Risk Assessment Analysis sheet identifies the Hazards and Hazard Effects and is used to assess the Risk as follows:

An initial Risk Factor will be obtained by assessing the severity and probability (frequency) of the harm that might arise from the Hazard.

Existing or proposed Hazard control measures will be entered against each identified potential accident. These measures should reduce the risk to an acceptable level. If the risk remains unchanged other remedial action should be specified on the sheet until it is reduced.

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### 3.11 QC Considerations

The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information as dictated in the procedure. Each task should be ticked completed as the work progresses. During the preparation of the work or its progress, intermediate check lists, as required, will be signed off. The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information.

On completion of the works the Project Engineer must collate the completed documentation. The on completed documentation will be included in the test report.

### 3.12 Management of Change

POWERPIPE operates a Safety Critical system. All 'Safety Critical' activities defined in this document are identified with the following:

STOP



The Safety Critical system is in place to ensure that all personnel are aware of critical stages as defined in this document.

Changes to procedure may be required as a result of changes in the scope of work.

Deviation from this procedure shall be subject to authorisation by POWERPIPE and PTT and shall be documented on a "Confirmation of Variation Instruction" form (Submitted only if necessary), will be used in any situation where the site works intend to deviate from the approved procedures. The POWERPIPE Engineering site representative is responsible for the development of the management of change and any associated risk assessment. The POWERPIPE Project Engineer will be responsible for compiling, logging and distributing the required forms as applicable and co-ordinating the risk assessment.

The Client representative and the POWERPIPE Project Engineer are responsible for the co-ordination and implementation of the management systems to authorize and manage changes.

### 3.13 Responsibilities

Project Personnel


Shall be familiar with all POWERPIPE Corporate and Project Quality Health, Safety and Environmental issues. They shall be responsible for identifying and reporting any non-conformance, hazards, near misses, accidents and incidents regardless of severity.

During engineering and operational phases of the works the following categories of POWERPIPE full time personnel shall be used:

Sr.No.	Designation	No of personnel
1.	Project Manager	1
2.	Project admin	2
3.	Project Supervisor	1
4.	Welding supervisor	1
5.	Foreman	2
6.	Pipe fitter	4
7.	Welder	4





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Sr.No.	Designation	No of personnel
8.	Helper	6
9.	Safety manager	1
10.	Safety Officer	2
11.	Fire watcher	2
12.	Rigger	4
13.	Hot Tapping , Line Stop Operator	4
14.	Scaffolder	4
<b>Tentative number of Manpower</b>		<b>38</b>

The responsibilities of each position are as follows:

#### 1. Project Supervisor / Safety Officer

Reports to Project Manager

The Project Engineer is responsible for all operational and fiscal aspects of the Project and is empowered to make Project related decisions on behalf of POWERPIPE. He is also an In-charge of performance management of vendors.

He will also be the primary on-site point of contact for the client and be responsible for generating the appropriate documentation including but not limited to the following:

- I. Job specific procedure
- II. Daily Operations Reports
- III. Equipment and personnel time sheets
- IV. Completion certificates
- V. Tool Box Talks
- VI. JSA's

#### 2. Technician/ Operator


Reports to the Project Engineer

- I. The Operator's responsibilities include the safe and efficient operation of equipment and assisting in the compiling of clear and concise records of operations.
- II. Pro-actively contributing to the overall site safety by reporting near misses and accidents to the site Project Engineer.

#### 3. Inservice Welder

Reports to the Welding Engineer

- I. The welder responsibilities include the safe and efficient inservice welding as per approved WPS in coordination with API-1104.

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*Refer Annexure*

#### 1.1.1 General Information

The client reporting and investigating procedure will take precedence in the event of an emergency.

However, any incidents involving injury to POWERPIPE personnel, damage to equipment, or high potential "Near Misses" will also be reported through POWERPIPE own reporting system, the Global Crisis Management plan.



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## 4 OPERATIONAL REQUIREMENTS


### 4.1 Pre-Job Safety Meeting & Toolbox talk

Prior to starting operations, the POWERPIPE Project Engineer and the Client Representative will hold a pre-job safety meeting. This meeting shall be attended by all relevant personnel and the forthcoming operations discussed. The following items should also be noted:

- All non-essential personnel will be excluded from the operation area.
- Heavy lifts are not permitted over POWERPIPE Equipment during Hot Tapping operations.
- POWERPIPE and operational personnel have checked the escape routes and made contingency plans.
- Adjacent systems shall be configured so that pressure cannot accumulate.
- Project Engineers to conduct formal shift handover.
- In addition to the above, toolbox talks will be held prior to any task/operation commencement. All personnel involved in operations will attend.
- The Project Engineer will brief all operatives in the ensuing operations, risk assessments reviewed and all necessary safety precautions discussed.
- Work permits to be signed off accordingly per shift.

### 4.2 System & Equipment Preparation

Pre-mobilisation and post-mobilisation (i.e. all Hot Tap and line stop Equipment along with its related accessories should be tested prior to mobilisation from POWERPIPE work base and on site prior to commencing operations) checks & function tests will be carried out to ensure that the equipment supplied for the project is suitable for the work scope. All equipment will be calibrated and fully certified. In addition, all fittings/connections/adapters on POWERPIPE equipment and PTT owned Equipments will be inspected upon completion of equipment being set up on location.

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### 4.3 Method Statement for In-Service Welding, Hot Tapping & Line Stopple Plugging.

#### IN-SERVICE WELDING

##### 4.3.1 General

- There are 2 primary concerns with welding onto in-service pipelines. The first concern is to avoid "burning through" where welding arc causes the pipe wall to be breached. The second concern is for hydrogen cracking, since welds made in-service cool at an accelerated rate as the result of the flowing contents ability to remove heat from the pipe wall
- Burning through is unlikely if the wall thickness is 6.4 mm. or greater, provided that low-hydrogen electrodes (EXX18 type) and normal welding practices are used.
- Electrodes shall conform to AWS A 5.1/AWS class Exx16 or Exx18 basic coated low-hydrogen electrodes shall be specified in the Welding Procedure Specification.
- Electrodes shall be stored in accordance the Manufacture's instructions in their original containers, which shall be marked with the Manufacture's name, the consumable trade name, and the batch number.

##### 4.3.2 Qualification of Welding Procedures

- Approved Welding Procedure Specification (WPS) & Procedure Qualification Record (PQR) shall be submitted which tested and qualified in accordance with API 1104 Appendix B.

##### 4.3.3 Work preparation of welding and testing of Split tee

###### ➤ Surface cleaning

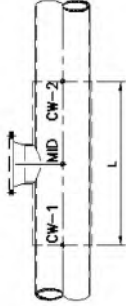
- Mark the desired location of the hot tap fitting.
- Clean the existing pipe in the area to be inspected to bare metal by mechanical means to remove all coatings, dirt, grease and other contaminants. Necessary precautions need to be taken not to remove the parent metal during cleaning.

###### ➤ Visual inspection & defect check of area to be welded

- The section of the run pipe to which the branch pipe or fitting is to be attached shall be thoroughly cleaned with a wire brush for a distance extending to a minimum of 150 mm either side of the branch or fitting. After cleaning, the run pipe shall be visually examined for laps, cracks, pitting or other form of damage. The fitting shall be located so as to avoid welding on minor flaws in the run pipe.
- Visual examination of non-existence of Pitting and corrosion on the selected area for Hot Tapping
- For full encirclement tees or sleeves, the run pipe shall be measured with callipers to ensure that ovality is acceptable for accommodation of the proposed tee or sleeve as below picture, ovality of each direction shall not be over 3 mm to avoid gap of split tee and run pipe



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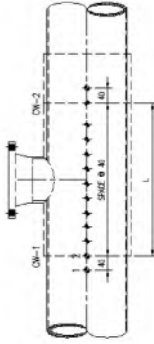


POINT	A-B	C-D
CW-1		
MID		
CW-2		

#### ROUNDNESS RECORD

#### ROUNDNESS MEASUREMENT

- The specific areas of the run pipe where attachment welds are to be made shall be ultrasonically examination the actual wall thickness for every 40-50 mm intervally, the minimum actual wall thickness shall be used for heat input calculation



#### THICKNESS ON LONGITUDINAL

POINT	1	2	3
LW-1			
LW-2			


#### THICKNESS ON CIRCUMFERENCE

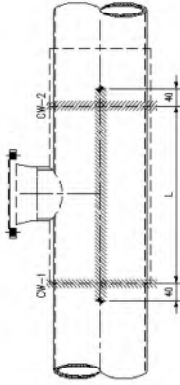
POINT	A	B	C
CW-1			
CW-2			

#### ACTUAL WALL THICKNESS VERIFICATION

- Radiographic Testing for pipe seam verification  
Existing pipe must be verified for seam position by radiographic test ting (RT). Seam of pipe shall not locate near the pilot drill, distance of pipe seam shall be 2 inch away from edge of pilot drill
- Ultrasonic examination shall be examined to ensure freedom from lamination



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POINT	ACCEPT	UNACCEPT
CW-1		
CW-2		
LW-1		
LW-2		

#### LAMINATION FREE SCAN AREA

#### LAMINATION FREE SCAN OF AREA WHERE ATTACH WELDMENT

#### Alignment and welding practices

##### Offset

- Pre-assembly of fitting on existing pipe shall be verified to ensure the curvature of fitting and pipe surface is within tolerance.
- The offset between the abutting edges for Groove welds should not exceed 1.6 mm. to obtain this alignment, devices should be used, or misaligned surfaces can be built up with weld metal.
- 2 sets of chain blocks shall be used to achieve an offset up to a maximum of 1.6 mm.


##### Root Opening

- The two halves of fitting should be clamped together around the pipe.
- Before the fitting is finally clamped together, Carbon steel backing strips shall be inserted into the machined recesses at the roots of longitudinal welds.
- The backing strip material shall remain within the essential variables of welding procedure qualification.
- The backing strip extension beyond the edges of the fitting shall be a minimum of 150 mm to allow attachment of suitably size run-on/run-off plates.
- Before the fitting is clamped, all visible surface grease in and around the recess of the branch flange, backing strip shall be removed by solvent cleaning.

##### Bevels

- Dye Penetrate Testing shall be performed on the bevels.
- Immediately prior to welding, the fusion faces and the adjacent material shall be free from planar defects, tears, moisture, scale, rust, paint, grease or other matter.
- Cleaning area shall extend to a minimum of 25 mm from the edge of the fusion faces on both the internal and external surfaces of the fitting.



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- Where the fitting thickness is greater than twice the run pipe wall thickness, the fitting shall be chamfered at 45 degree to enable fillet weld leg lengths of two times the run pipe wall thickness, see Figure 5

➤ **Cleaning:**

- Each run of weld metal shall be thoroughly cleaned with hand or power tools before a further run is applied.
- Visible flaws such as cracks, cavities and other deposition faults shall be removed before deposition of further weld metals.

➤ **Fit-up**

- A Yoke-type clamp or chain blocks shall be clamped around the circle of run pipe. Maximum gap between ID of split Tee fitting and OD of the run pipe should be: max 3.2 mm
- Longitudinal groove welds, Max. Gap not exceeds 5 mm. along the longitudinal bevels.
- Circumferential fillet welds Max. Gap not exceeds 1.6 mm. around circle of run pipe.
- Verify that the axial centerline of the Tapping path intersects the axial centerline of the run pipe at right angles.
- Maintain a positive support of the Tapping fitting especially the flange alignment.

➤ **Tack welding:**

- Tack welding is recommended the circumferential should be done on the sequence of opposite side such as 12 o'clock & 6 o'clock, 3 o'clock & 9 o'clock (or equivalent to avoid longitudinal groove ends position)
- Number of Tack welds the longitudinal should be available on qualified welder skill.


➤ **Welding Sequence:**

**a) General**

- Prior to start welding, Customer to confirm that the flow rate of the line being weld shall not be less than 0.4 m/s
- The welding sequence for split tees shall be shown in Figure-1.

**b) Longitudinal groove welds ( LW-1 & LW-2)**

- Using 2 two welders where the fitting is 750 mm or more in length, weld both longitudinal seams simultaneously. Start the welds from the center of the fitting in opposite directions and progress to the ends.
- Repeat this step, staggering the start/stops, until the seams are 1/3 of the cross-sectional area of the welds.
- Complete the longitudinal seams until full of the cross-sectional of the welds. This can be accomplished using one or two welders, which welding may progress in the desired direction or from one end to the other.

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**c) Circumferential fillet welds (CW-1, CW-2)**

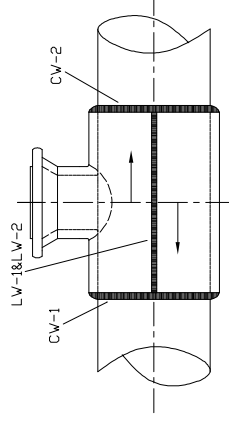
- Circumferential welding shall only commence after completion of longitudinal welds.
- Circumferential tack shall be removed after completion of longitudinal welds.
- The welds bead deposition sequence shall be welded as shown in passes sequence of Figure 2
- The second circumferential fillet weld shall only be started after completion and cooling of the first fillet. At no time shall circumferential fillet welds be attempted simultaneously.

**d) Buttering for circumferential fillet welds**

- Buttering technique shall be used on the run pipe wall as shown in the passes 1 – 3 of Figure 3. Additional reinforcement shall be applied over the buttering layer where the gap between the fitting and run pipe exceeds 1.5 mm, as shown in passes 4-6 of Figure 4.
- The first buttering pass shall be deposited as close as possible to the fitting without impinging or making ant attachment to it.
- The fillet leg length and gap between the pipe and fitting shall determine the number buttering passes required. Pass 6 or its equivalent without impinging on the run pipe wall.

➤ **Number of welders :**


- Longitudinal groove welds where the fitting is 750 mm or more in length, at least 2 welders shall work on each seam (if site condition is applicable).
- Circumferential fillet welds on pipe of 323.9 mm (8 ") OD and larger, 2 welders shall be employed working on the opposite sides of the pipe (if site condition is applicable). At no time shall the welders' weld pools have less than 50 mm separation.



**Figure-1 Encirclement Split Tee fitting Welding sequence**





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NOTE: Welding of longitudinal welds to commence in the center of tee. Weld starts shall be overlapped and ground. Welding to continue in this manner until 10 mm to 12 mm in cross sectional thickness is deposited.

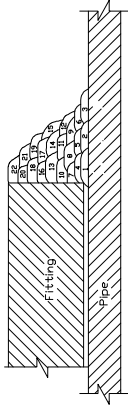


Figure 2 Weld bead deposition sequence

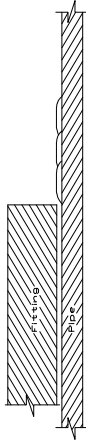


Figure 3 Detail of buttering layer onto pipe

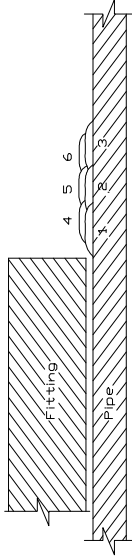


Figure 4 Suggest method of reducing gap between pipe and fitting before welding to fillet throat

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Figure 5 Dimension of fillet leg length to suit thickness of fitting

#### Alignment and welding practices for O-let fitting

- Maintain gap between 2-3 mm. for complete joint penetration of root pass
- The welding sequence shall be shown in Figure-6

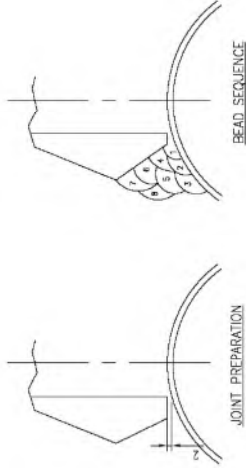


Figure 6 : Alignment and welding practices for branch nozzle with O-let fitting

#### 4.3.4 INSPECTION AND TESTING

##### Visual inspection:

- All welds shall be inspected by visual inspection during and after welding to ensure that slag is removed between passes.
- Undercutting shall be treated by grinding and blending provided that the specified minimum wall thickness for the pipe and fitting are maintained.



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➤ **Non-Destructive Testing:**

- **Root pass :** for both groove weld and fillet weld prior to deposition of further weld metal shall be performed Magnetic Particle Testing on the completed of The root pass
- **Hot pass :** for both groove weld and fillet weld Every layer of hot pass shall be performed Magnetic Particle Testing
- **Finished pass :** The completed assembly welds shall be magnetic particle inspected not sooner than 24 hours after completion of the joint.

➤ **Sequence of weld Beads Inspection Testing Table**  
Groove Weld No. LW1 / LW2 (Longitudinal Weld)

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X		X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	

**Circumferential Weld / Fillet weld**

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X	-	X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	MT Delay crack


➤ **Strength Test Pressures:**

- The test pressure will depend on the actual internal pressure of the run pipe at the time of the hot-tap and the ability of the run pipe to withstand external pressure.

➤ **Pressure Test:**

- For split tees, the maximum allowable pressure differential (  $\Delta P$  ) with respect to buckling of the run-pipe calculated as defined in ASME VIII, Division 1, Section UG-28.
- Therefore  $PT = PA + \Delta P$
- Where  $PT$  = test pressure      And       $PA$  = actual operating pressure in the run-pipe



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➤ **Testing Media:**

- Where practical, the testing medium shall be water. In some applications where it is desirable to avoid water in the split-tee annulus, the use of liquid hydrocarbons may be suitable, subject to acceptable safety precautions. For the condition of operating temperature higher than 100 C, hot oil shall be used for testing.

➤ **Testing Duration:**


- Testing of branch connection, with the valve installed and in the open position, to demonstrate leak tightness and strength. Duration should be at least 15 minutes.

**1. Welding Hot Tap, Line Stop Fittings and its Accessory Fittings into 24" Header Line.**



- Experienced In-service welders qualified should be deployed to execute the welding of fittings.
- Pipe line should be exposed and all painting should be removed at Marked location where Hot Tapping Operation need to be carried out.
- Thickness survey and Ultrasonic Lamination Check of the pipeline areas where Hot Tap Fitting to be welded will be conducted by a certified testing agency.
- UTL reports will be reviewed by the PTT Representative and Approval/permit for taking up the welding activities will be issued by the same.
- One number of **24"x24"x300# Hot Tap Fitting along with 24" x300# Full Bore Gate Valve , 24"x24"x300# Line Stopple Fitting , 24"x2"x300# TOR Fitting , 24"x4"x300# Weldolet Fitting** is welded where UTL is carried at Upstream and Downstream Locations.
- **All welding shall be as per API 1104 Appendix B.**
- A Minimum flow shall be maintained during welding to dissipate the generated heat during welding.



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- At No-Flow condition the cooling rate of each weld bead is noted and its ensured that there won't be any temperature buildup in the weld area. Once after confirming the same the welding activities are proceeded.
- Temperature of weld areas are regularly noted using calibrated Temperature Measuring instrument.
- Non-destructive tests (NDT) shall be done, during and after welding as specified in the approved WPS.

## 2. Sandwich Valve / Isolation Valve Installation



- 24"X 600 # Sandwich Valves along with 24"x600#/24"x300# Reducer Spool are installed upon the Line Stop fittings.
- 2"X 300 # Ball Valves are installed upon the Pressure Equalization fittings.
- 4"X 300 # gate Valves are installed upon the Vent fittings.
- It's made sure that the valves are full bore and 100 % open.



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## 3. Hot Tapping Operation and Installation of 24" Permanent Bypass Line



### 3.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer .
- Pressure testing of Hot-tapping machine.


### 3.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or international, or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre tested ANSI class FULL BORE ID gate valves furnished by Contractor or Owner
- Demonstrate of hot tap equipment to customer satisfactory

### 3.3 Remove blind flange.

- Check raised face of the Hot Tap Fitting Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment



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- Check gasket so that no part will extend into the bore of the valve.

#### 3.4 Clean valve faces & Install Full bore ID Tapping Valve:

- Install new gasket on all connection
- Lower valve into the fitting slowly, keeping stud free in flange bolt holes.
- Open Tapping valve and align bore of valve with bore of the fitting as near perfect has possible.
- Install studs & nuts and tighten evenly using the proper sequence
- Take required Tapping measurement

#### 3.5 Check Tapping Valve.


- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Measure valve for sufficient housing space for cutter and pilot. Face of valve to seat rings. Record this dimension.

#### 3.6 ASSEMBLE THE TAPPING MACHINE:

- Check boring bar drive ring for tightness and damage.
- Check the retainer shaft packing nut. Packing nut must not extend out onto the taper of the boring bar.
- Clean ring joints and steel ring gasket.
- Install adapter on tapping machine adapter and snug the top two bolts, leaving others loose.
- Extends the boring bar beyond the face of the adapter. Install the cutter holder in the boring bar. Tighten the retainer shaft with the measuring rod. Install the safety pin with cotter pins on both ends.
- Check cutter teeth and outer diameter of the cutter, install cutter on cutter holder and tighten the socket head bolts and lock nuts. An acceptable alternative is to assemble the cutter and the cutter holder before installing the cutter holder in the boring bar.
- Check the U-rods, pilot drill, and nylon lock pin in pilot. Then install pilot in the cutter holder and tighten.
- Align the adapter with the cutter and tighten adapter bolts. For alignment reference, measure from the outer diameter of the cutter to the outer diameter of the flange raised face. Rotate the cutter 180 degree and recheck the alignment. If alignment changes when the cutter is rotated check the cutter, cutter holder, and boring bar for damage.
- Retract the boring bar and cutter all the way. Take measurement with the measuring rod.

#### 3.7 CALCULATE THE TAPPING DISTANCE:

- Measure the distance from the pilot tip to the face of the adapter (Measurement A).

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- Measure distance from top of the valve to the top of the pipe wall (Measurement B) .
- Calculate distance the pilot and the cutter must travel to complete the tap after the pilot contacts the pipe wall (Measurement C) .
- If the pilot is inside the adapter , total of A+B equals the distance the pilot must travel to contact the pipe.
- If the pilot tip extends beyond the face of the adapter, total of B-A equals the distance the pilot must travel to contact the pipe wall.
- Measure the distance the pilot tip extends beyond the cutter teeth.







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STOPPLE PLUG PROCEDURE  
(SCOPE#2)

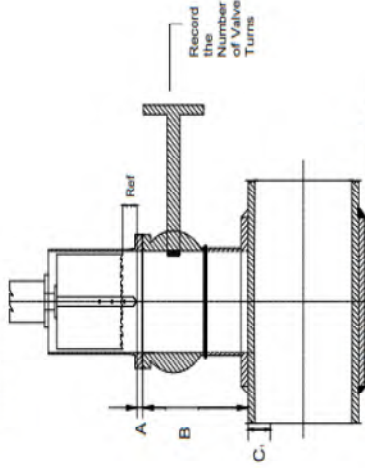
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### Hot Tapping Measurement Card for 24"x20"

Header Pipe OD : ..... Date : .....  
Branch Size : .....  
Pipeline Thk : .....  
Cutter OD : .....



$$C_1 = \left( \frac{B_{\text{Pipe OD}}}{2} \right)^2 - \left( \frac{\text{Cutter OD}}{2} \right)^2 \Bigg)^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel . Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{B_{\text{Pipe OD}}}{2} \right) + \text{Ref}1 + 1/8"$



HOT TAP TIE-IN AND HOT TAP  
STOPPLE PLUG PROCEDURE  
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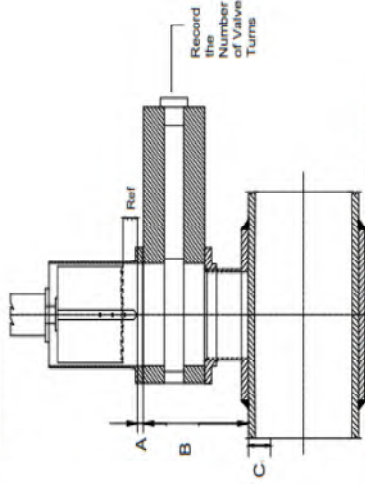
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### Hot Tapping Measurement Card for 24"x24"

Header Pipe OD : ..... Date : .....  
Branch Size : .....  
Pipeline Thk : .....  
Cutter OD : .....



$$C_1 = \left( \frac{B_{\text{Pipe OD}}}{2} \right)^2 - \left( \frac{\text{Cutter OD}}{2} \right)^2 \Bigg)^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel . Lower-in +C	
Max. Tapping Distance	


Max. Taping Distance = Lower-in Distance +  $\left( \frac{B_{\text{Pipe OD}}}{2} \right) + \text{Ref}1 + 1/8"$





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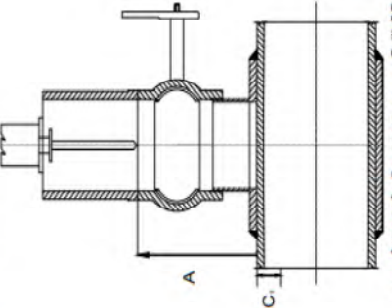
### Hot Tapping Measurement Card for 24"x2"

Header Pipe OD : ..... Date : .....

Branch Size : .....

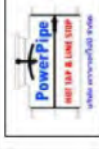
Pipeline Thk : .....

Drill Bit Dia : .....


$$C = \left( \frac{PIPE\ OD^2}{4} \right) - \left( \frac{DRILL\ OD^2}{4} \right)^{1/2}$$

A Top of the Valve to Top of the Pipe	
= Lower-in Distance	
C <sub>1</sub> Tapping Distance from Calculation	
Total Travel , Lower-in +C <sub>1</sub>	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE\ OD^2}{4} \right) + 1/8"$



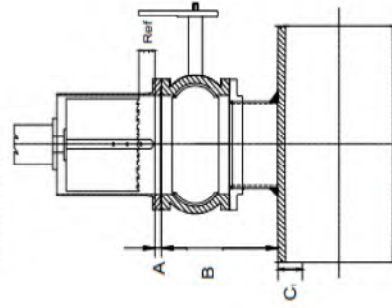
### Hot Tapping Measurement Card for 24"x4"

Header Pipe OD : ..... Date : .....

Branch Size : .....


Pipeline Thk : .....

Cutter OD : .....


$$C = \left( \frac{PIPE\ OD^2}{4} \right) - \left( \frac{CUTTER\ OD^2}{4} \right)^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref. Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel , Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE\ OD^2}{4} \right) + Ref1 + 1/8"$

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### 3.8 Install Tapping Machine on the Tapping Valve.


- Align bolt holes on the flanges.
- Install bolts and tighten evenly.
- Install bleeder valve and leave it open.

### 3.9 Perform leak test of machine assembly & Operational check

- Pack Nitrogen into machine set-up to displace any possible pressure of air in between tapping machine, adapter, valve and fitting and pressure test (Leak Test) assembly to customer specification to ensure bubble tight seal on all bolted connections prior to any hot tapping.

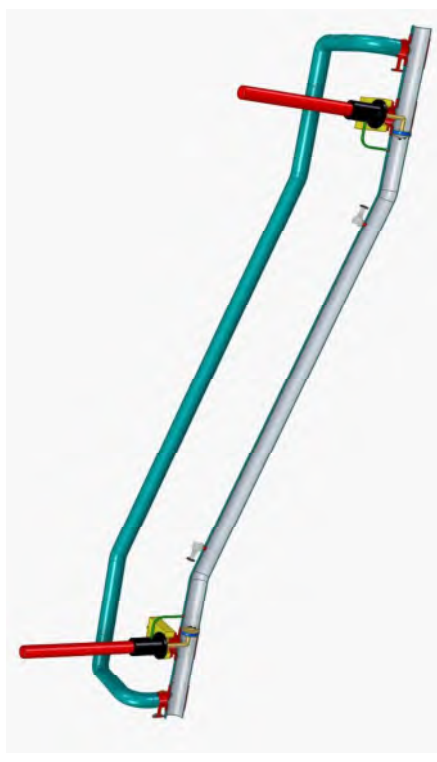
### 3.10 Hot Tapping Operation -

- Take all the required measurements, record them on measurement card and mark the same on measuring rod.
- Calculate the cutting distance and time required for cutting.
- Re-check number of 'U' rods coming under the span of calculated cutting distance.
- Re-check that boring bar is fully retracted.
- Assemble the Hot tapping machine on the Gate Valve.
- Close the Isolation valve (Count and record the number of turns).
- Check for alignment in all directions and tighten the bolts.
- Open the Isolation Valves (Count and record the number of turns).
- Open the bleeder valve and ON the nitrogen supply.
- After few minutes, CLOSE the bleeder valve and raise the pressure as required by test norms (Generally 1.1times the working pressure).
- Leave the set-up pressurized for 15 minutes; Check all flange and threaded joints for any leakage using soap solution or any other approved method.
- LOWER-IN the boring bar manually as per measurement (By turning the crank handle clockwise) till you feel that Pilot drill has touched the top of the pipe, and cross check with measuring rod.
- Retract the boring bar 3 to 4 turns (turn anticlockwise).
- Engage the power source with machine drive.
- Open the Tapping machine control valve.
- Complete the pilot drill (According to measuring rod), also can be verified by checking the rise or drop in pressure gauge fitted.
- Once the pilot is complete, Close the machine control, Disengage the machine from power source and drive the boring bar manually till the cutter touches the top of the pipe (check the marked indications on measuring rod) also can be re-checked by one's feel.
- Retract 3 to 4 turns and engage the power source with machine drive, Open the Tapping machine control valve.
- Complete the tapping (According to measuring rod).

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- Once the Tapping is complete, close the machine control, Disengage the machine from power source and drive the boring bar manually for 1/8".
- Just open the machine control and rotate the boring bar (Cutter) without engaging the clutch for few minutes to ensure that coupon is free.
- Close the machine control, OFF the power source.
- Retract the boring bar manually till initial reading (marked on measuring rod).
- Close the Isolation valve (cross check the 100% closing by counting the number of turns); open the bleeder valve to drain out the product remaining in the machine housing.
- Once draining is complete, remove the Hot tapping machine and handover the coupon to PTT.
- Cut the 24"WNRF Flange from the Hot Tap Fitting and Weld the New Permanent Bypass line (Hydrotested) at Upstream and Downstream Locations.
- Above Procedure is to be repeated for carrying Hot Tapping on 24"x24"x300# , 24"x2"x300# , 24"x4"x300# Fittings at Upstream and Downstream Locations.

### 4. LINE STOP PROCEDURE



### 4.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer
- Pressure testing of Hot-tapping/Line Stop machine.



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#### 4.2 Discussion with pipeline owner, contractor


- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or international; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre-tested ANSI class full bore valves

#### 4.3 Remove blind flange.

- Check raised face of the Line Stop Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.

#### 4.4 Check Isolation Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Assembly line stop machine with plugging head.
- Customer to confirm the velocity in line prior to line plugging.
- Install Line Stop Machine on Sandwich valve , Pressure Equalization need to be carried out using 2" TOR Fitting .
- After the Pressure is equalized , Open the Sandwich Valve Gate.
- Set plugging head into the line. **(Always Downstream Plug to be set first.)**
- NOTE: Pressure, flow rate, velocity will be considerations to look into and discuss/verify with the customer prior to job commencement.

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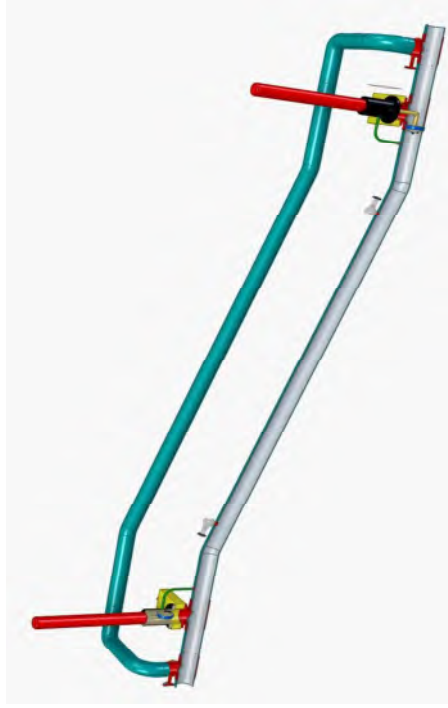


Fig. Insertion of Downstream Stopple Plug into Pipeline.

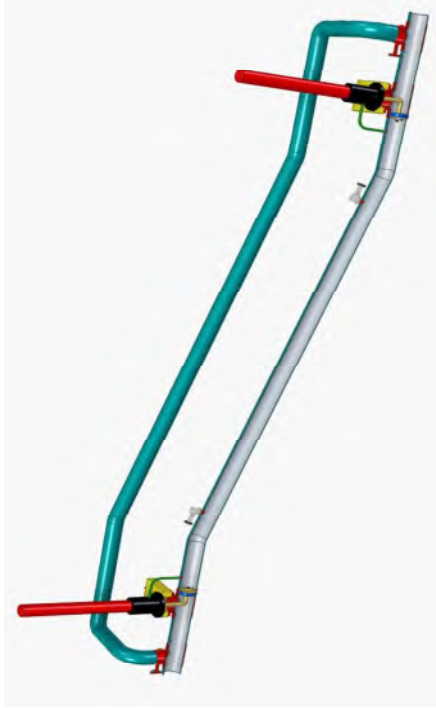



Fig. Insertion of Upstream Stopple Plug into Pipeline.



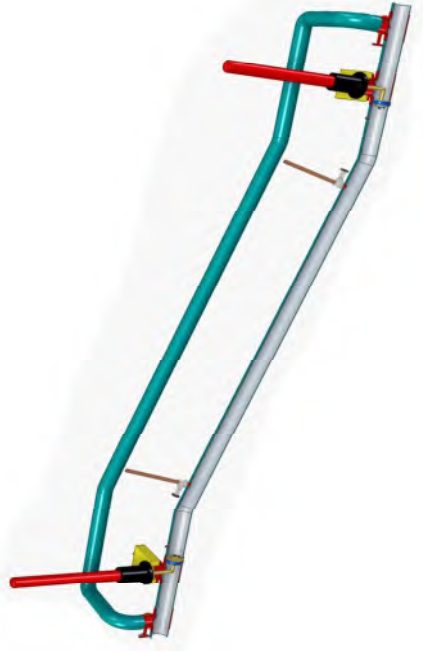


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#### 4.5 Relieve pressure in isolated section and check for seal integrity.

- After plugging machine is set, close the 2" Pressure equalization valves , Dismantle the Hose.
- Isolate the Section using 4"weld-olet fitting .
- The Stopple Seal Integrity can be verified during this stage using Pressure Gauges .
- Monitoring pressure at downstream portion for 0.5 hours, if there is no pressure built up customer is able to perform pipeline modification works.
- Dead Section is subjected to Nitrogen Purging , then Cold Cutting is carried out.



**Fig. Venting of Isolated section using 4" Weld-olet Fitting.**

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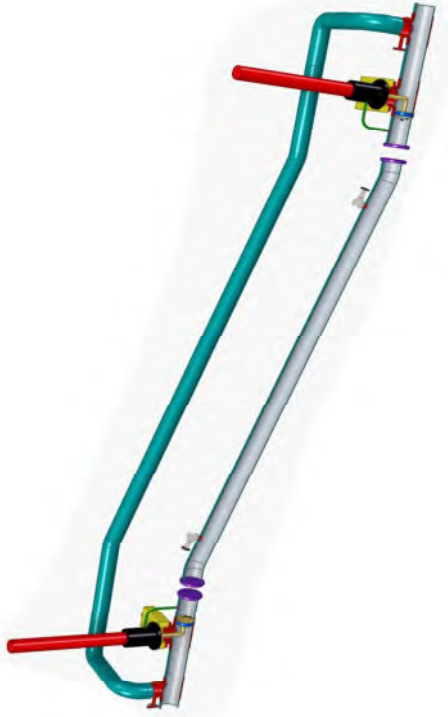
**Fig. Cold-Cutting of Header Pipe.**

#### 4.6 Proceed to Remedial work & Re-Commissioning of 24" Header Line.

- Gas Check
- N2 purging if required
- Cutting undesired portion.
- Welding of Dish Ends & golden joints of Live Section are subjected for Radiographic examination at Upstream and Downstream Location.
- After the Successful NDE results , the Header line is re-commissioned using 2" TOR Fitting.




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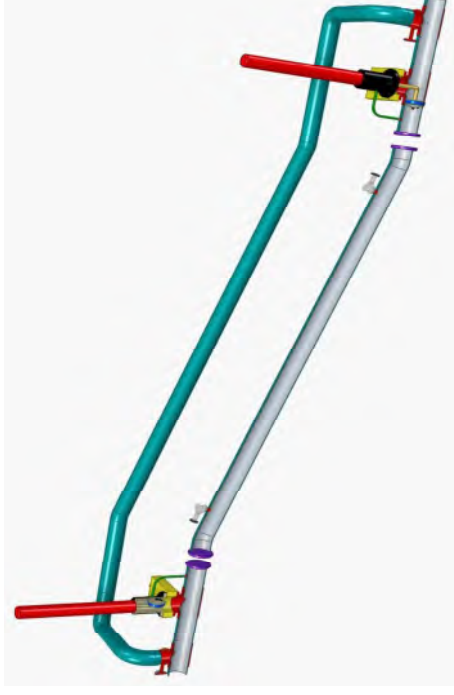


**Fig. Welding of Dish Ends into the Live and Dead Section , Pressure Equalization for Stopple Plug Retrieval.**

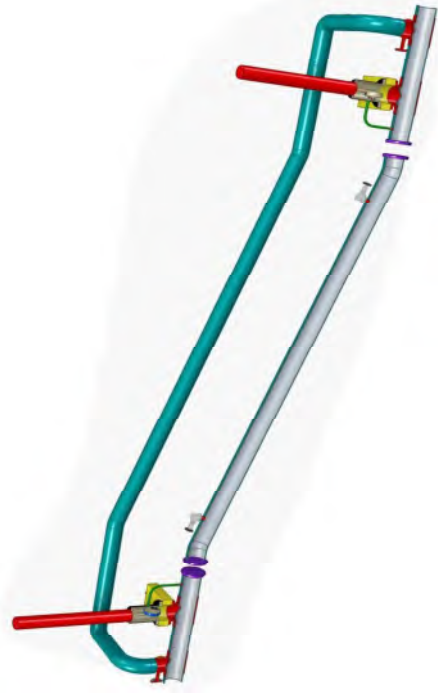
#### 4.7 Stopple Plug Retrieval and Dismantling of Stopple Assembly.

- After pressure equalization, Upstream Stopple Plug is retracted first , then Downstream Stopple is retracted.
- Close the Sandwich Valves and 2" Equalization valves .
- Open bleeder valve to relieve trapped pressure in Stopple Housing , Dismantle the Stopple Housing Assembly.

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**Fig. Upstream Stopple Plug Retraction**



**Fig. Downstream Stopple Plug Retraction**



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#### 4.8 Temporary and Permanent Line Blinding.

- Check OD of LOR plugs.
- Install plug and plug holder to tapping machine.
- Clean, check for damage and lubricate.
- Install the tapping machine on Sandwich Valve , Equalize the Pressure , below and above the Sandwich Valve Gate.
- Open the Sandwich valve.
- Extend to insert special LOR Plug into set position, engage segments in LOR flange and fully retract boring bar.
- After the completion Plug is installed , Release the trapped pressure in the adaptor using bleeder valve , and check for any pressure build up above the completion plug.
- Once no pressure build up found , Dismantle the Tapping machine assembly and 24" Split-Tee are permanently blinded by installing BLRF Flangesat Upstream and Downstream Locations.
- 2" TOR is temporarily blinded with Brass plugs and Permanently blinded with end caps tack welded.



Fig. Permanent Line Blinding using Completion Plugs and Blind Flanges





Hot tap fitting, split tee  
In-service welding  
Hot tapping services  
Line stop services  
Piping services

## PROJECT METHOD STATEMENT

### Hot tap & Line stopping

### For pipeline modification

### Section 2 (NR2-Rangsit MR.)



PTT PUBLIC COMPANY LIMITED

PROJECT	: RE-ROUTE PTT PIPELINE HSR 4-2
Owner	: PTT Public Company Limited
CONTRACTOR	: SIAMRAJ PCL./POWERPIPE CO., LTD.
PwP Project No.	: J2202
Siamraj Doc.No.	: xxxx-xxxx-xxxx
PwP Doc.No.	: PwP-MST-02 for section 2

POWERPIPE REVISION RECORD				
Rev	Date	Status Description	Prepared POWERPIPE	Checked Siamraj PCL.
R0		Submitted for Approval	Leston Rihal Dsouza	
				Approved -PTI-



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# 1.0 INTRODUCTION



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### 1.1 General information

This document covers the safe working practices for the execution of Hot Tapping and Line Stopple Plugging operation Including In-service welding works.

It is the responsibility of POWERPIPE project execution team and shall be adhered to all personnel involved with the operation.

The purpose of the project is to "**RE-ROUTE PTT PIPELINE HSR 4-2**".

### 1.2 Abbreviations and Definitions

Terms	Definition
Psi(a), Psi(g)	Pressure in Psi, absolute and gauge
Owner/Client	PTT
Main Contractor	Siamraj PCL.
Hot tap Contractor	POWERPIPE CO., LTD.
HSE	Health, Safety, and Environment
JSA	Job Safety Analysis
m.	meter
m3	Cubic meter
MSDS	Material Safety Data Sheet
N/A	Not applicable
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PSV/PRV	Pressure Safety Valve/Pressure Relief Valve.
PTW	Permit to Work System
Rev	Revision
Scf.	Standard Cubic Foot
FIM	Free Issue Material

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Project  
Re-route PTT pipeline HSR 4-2

Flammable Service  
A fluid which, under expected operating conditions, is a vapour or produces vapours that can be ignited and continue to burn in air

Hazardous Substance  
Included, but not limited to, those substances that are explosive, combustible, toxic or corrosive

Hot Tapping  
The technique of attaching a mechanical or welded branch fitting to piping or equipment in service, by creating an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting.

Gate Valve  
A gate valve, also known as a sluice valve, is a valve that opens by lifting a barrier (gate) out of the path of the fluid. Gate valves require very little space along the pipe axis and hardly restrict the flow of fluid when the gate is fully opened. The gate faces can be parallel but are most commonly wedge-shaped (in order to be able to apply pressure on the sealing surface)

Manufacturer/Vendor  
The party which manufactures and/or supplies equipment, technical documents/drawings and services to perform the duties specified by the POWERPIPE

On-Plot Piping  
Pipe system designed in accordance with ASME B31.1, ASME B31.3 (see Note below)

Operating Conditions  
NOTE: Some parts of a pipeline system, although located "off-plot", may be designed in accordance with ASME B31.3. For the purposes of this specification, such piping shall be considered to be On-plot. Similarly, some refinery piping, although physically located "on-plot", may be designed in accordance with ASME B31.4 or B31.8. For the purposes of this specification, such piping shall be considered to be Off-plot

Run-Pipe  
All conditions of piping and equipment when containing hydrocarbons under a positive internal pressure

Shall  
The existing pipe into which a Hot-Tap is to be made

Should  
Indicates a mandatory requirement

Site  
Indicates a strong recommendation  
Any place where the facilities will be reinstated, constructed and/or installed

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### 1.3 Pipeline Data Sheet

Main Pipeline Size	24 Inch
Wall Thickness	0.688"
Pipeline Material	Carbon Steel
Orientation Of Pipe	Horizontal
Service Fluid	Natural Gas
Design Pressure	720 Psi
Operating Pressure ( Max/Min)	460 Psi
Design Temperature	176 Deg. Far.
Operating Temperature	77 Deg. Far.
Branch Size for Hot Tapping	20 Inch
Branch Size for Line Stopple Plugging	24 Inch
Orientation of Tap	12 – O' clock position
Valve Type	24" X 300 # Sandwich Valve , 24" X 300# Full Bore ball Valve.
Fitting Type	Fully Enciclement Split Tee

### 1.4 Communications

Throughout the Project communications should be maintained between POWERPIPE Operations Manager and PTT, EIC. If communications fail at any given time, the operation shall cease until communications are re-established.

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### 1.5 References

1. API RP 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries
2. API 1104 Welding of Pipelines and Related Facilities
3. ASME B3 1.8 Process Piping
4. ASME B1 6.5 Steel Pipe Flanges & Flanged Fittings
5. ASTM A 106 Standard Specifications for Seamless Carbon Steel Pipelines
6. API 5L Specification for line pipe.
7. ASME B 16.25 : But Welding Ends.
8. MSS-SP44 Steel pipeline flanges
9. ASME Sec.VIII : Boiler & Pressure Vessels Code-Rules for the construction of pressure.
10. ASME Sec. V: Non-destructive examination.
11. ASME Sec. IX: Welding.
12. ASME Sec. VIII Div. 1 & 2: Fabrication.
13. ASTM A694: carbon and alloy steel forgings for pipe flanges, fittings, valves, and parts for high pressure transmission service.

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## 2.0 SCOPE OF WORK

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This document gives the detailed requirement to be covered the task as listed below:

1. Existing pipe wall thickness check (See PAE-UTM-008)
2. U.T. Lamination checking of pipeline (See PAE-UT-004)
3. Pipe seam verification (See PAE-RT-001)
4. Roundness checking
5. Fitting installation
6. Welding
7. Inspection and testing
8. Hot tap operation
9. Line stop Operation
10. Pipeline modification
11. Completion plug installation

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## 3.0 HEALTH, SAFETY & ENVIRONMENT

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A copy of the POWERPIPE Health, Safety and Environmental Management Systems Manual will be kept on site and is available for review by PTT.

The standards and safe working practices outlined in this document will be adopted and referred to throughout POWERPIPE operations on site.

All work will be carried out in accordance with the PTT and the POWERPIPE QHSE Plan.

Every day recording of the manpower available at site before start of the work to be carried out.

### 3.1 HSE Considerations

Safety is the responsibility of every employee irrespective of status. Employees will ensure that their workplace is safe and functions efficiently and safely. Common sense should be applied for 'safe working' practices to be implemented and adhered to at all times. Particular attention will be given to work site safety and to any safety systems and procedures provided. POWERPIPE to complete any Client site specific safety training and site orientation prior to commencing site activities.

Personal Protective Equipment (PPE) will be issued to all personnel. The minimum PPE of hard hat, safety boots, full length coveralls, gloves and eye protection will be worn at all times when working on site.

Barriers will be erected in order to ensure that unauthorised personnel do not enter the worksite, and tannoy announcements will be broadcast to warn personnel of any operations that require the worksite to be barriered off.

All Hot tap and line stop equipments along with its accessories will be checked to confirm that they are of a suitable pressure rating for the task. All air hoses will and be secured with whip-checks & R-pins.

On completion of the work scope, and prior to demobilisation, any equipment which is damaged or faulty will be clearly red tagged and an equipment damage report will be completed.

Any equipment which may contain residual chemicals will be clearly tagged, and the base will be made aware of these items prior to the items being demobilised.

### 3.2 Safety Systems

The worksite Permit-to-Work system will be implemented and strictly adhered to at all times. No work will be carried out unless the required Permit has been raised, authorised and signed on. If the scope of work changes during the duration of the Permit, the POWERPIPE Project Engineer will ensure that any changes to the work are discussed with (Company and Client), and the permit modified (if necessary) and re-issued.



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Prior to operations commencing, a Pre-Job Safety Meeting will be held to ensure that all parties involved in, or affected by, the work are aware of its nature and of the hazards involved. The meeting will be held on site and recorded on the Pre-Job Safety Meeting Form. Any outstanding actions following the meeting will be closed out prior to operations commencing.

Any employee shall have the right to stop operations for discussion if he/she feels that there is a breach of safety procedures, or if an unsafe act is taking place.

### 3.3 Site Induction and Permit to Work

All POWERPIPE operational personnel must have attended the PT/ site safety induction course prior to commencement of operations. The POWERPIPE Project Engineer will brief personnel on the operational requirements, site hazards and relevant safety issues.

All works must be carried out in accordance with the client safe working procedure. Job Risk Analysis is to be prepared and approved by client HSE before starting work.

### 3.4 Pre-Job Safety Meetings and Toolbox Talks

I. The POWERPIPE Project Engineer immediately prior to commencement of operation will hold a Pre-Job Safety Meeting on site. All personnel involved in flushing operations should be in attendance.

II. The meeting will cover all job and site related hazards, safety controls in place, contingency plans in the event of emergencies and any other points deemed relevant. Any questions or queries should be raised at the meeting. Minutes of the meeting will be recorded on a POWERPIPE Pre-Job Safety Meeting Form.

III. The POWERPIPE Project Engineer will conduct Toolbox talks before each new task/operation is undertaken, which will be recorded on the appropriate form. The purpose of the talks is to inform the POWERPIPE Crew of any potential hazards, safe working practices to be adopted and contingency plans in the event of an incident/accident. Client or third party personnel affected by the works are invited to attend.

### 3.5 Hot Tapping Operation.

- During Hot Tapping operation the surrounding area around-off point will be access restricted by use of barricade safety tape at a distance 10 meters from the tapping point. In addition to this danger signs shall be located in a sufficient distance around the area to warn the personnel of the activity.
- Ensure all the surrounding area is cleaned and all loose construction materials is removed, access to the restricted area shall only be permitted by the supervision.
- Ensure that the surrounding equipment are properly protected from the loose and unwanted materials from the blow off point.

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iv. Ensure all the required personnel protective equipment such as ear plugs, gloves, safety glasses etc. are to be provided and worn by all the personnel involved in the operation.

### 3.6 Near Miss / Incident / Accident Reporting

I. It is the policy that all accidents, incidents or near misses involving POWERPIPE personnel, equipment, property, or affecting third parties, must be reported without exception. This includes the operations and employees of companies subcontracted by POWERPIPE Services.

II. All employees must be aware of these requirements and of their duty to recognize and report any occurrence, which comes within the terms of the POWERPIPE and relevant Client Accident reporting system. POWERPIPE Project Engineer shall satisfy himself that all personnel under his control are aware of this requirement and shall periodically check this fact.

### 3.7 Emergency Response Plan

Following are the major emergency incidents that might occur at site.

- Fire / Explosion.
- Injury due to lifting operation, fire, electrocution, civil unrest, Natural disaster, Medical also.
- Toxication.
- Objects falling from height, sliding, moving parts, drowning, etc.
- The possibility of such an emergency occurring although is very less, the company has the requisite preparedness in such an eventuality.

#### FIRE/EXPLOSION LEADING TO EVACUATION:

- Fire or explosion that has occurred at site and which is out of control and no longer localized to that section only shall be called as an 'EMERGENCY'. It is left to the discretion of the personnel at site of incident whether to call for an emergency or not.  
Emergency will be activated by any of these means – over the phone or by word of mouth or by shouts or using emergency siren. On activation of the emergency at the site, all those present at the work location including Technicians, supervisors, coordinator, helpers shall assemble at the Assembly Point and immediately report to their respective seniors as planned.
- The Assembly Point of the Industry or site is the open space present in front of the security room/ where it is safe.
- The Engineer in charge shall report the head-count and the presence of their respective personnel and that of the Technician, supervisor who were under their control. The Manager or his designate who is the head-count man shall be the Site Incident Controller. He shall first ensure that the working area has been completely evacuated.

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V. Site Incident Controller will assume full control of the administrative aspect of the emergency. He shall dictate the immediate action to be taken at the Scene of incident. He shall guide the assembled people on further course of action.

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

Note:

- I. During an emergency always ensure that you do not panic or give any scope for confusion or chaos.
- II. Do not spread rumors or gossips.
- III. All shall adhere to the instructions delivered by the Site Incident Controller.
- IV. Make way for the emergency fighting resources to reach the source of incident.

TOXICATION:

Many chemicals found in the pipeline/work place have a harmful effect on humans. These chemicals may enter the body through skin absorption, through respiratory or elementary systems. Harmful effects may become apparent immediately or in the short / long term. In case of emergencies where gases enter the atmosphere is a critical area, as volumes of dangerous impurities are difficult to measure. It is therefore essential to that detection of any traces of dangerous gases above the Threshold Limit Value (TLV) and take the necessary safety precautions.

Special attention is drawn to the possible presence of extremely poisonous substances.

INJURY WHILE WORKING, FALL FROM HEIGHT/OBJECTS FALLING FROM HEIGHT

While working at a height or while working/ walking near the site of works the possibility of fall from height or objects falling down is present and injury while working.

When you find someone being injured while working or by fall or by an object falling from a height.

- I. Immediately isolate the person from the source of injury ensuring that further danger or severity is arrested.
- II. Call for qualified assistance.
- III. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

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EMERGENCY NUMBERS AND TRAINED FIRST AIDERS

<p>EMERGENCY PHONE NUMBERS:(IN HOUSE)</p> <p>Anywhere in India (Toll free)</p> <p>FIRE – 101</p> <p>AMBULANCE – 102/108</p> <p>POLICE – 100</p> <p>PROJECT INCHARGE –</p> <p>HSE OFFICER –</p> <p>HOSPITAL -</p> <p>AT PLANT</p> <p>FIRE STATION – FIRE</p> <p>MEDICAL-SECURITY-</p>
--

TRAINED FIRST AIDERS AND FIRE FIGHTERS

NAME	DESIGNATION

CIVIL UNREST

- I. Civil unrest, is an activity arising from a mass act of civil disobedience (such as a demonstration, riot, or strike) in which the participants become hostile toward authority, and authorities incur difficulties in maintaining public safety and order, over the disorderly crowd. It is, in any form, prejudicial to public law and order.
- II. Familiarize yourself with the route, site set-up, and range of exits, help & security points.
- III. know alternative routes on different modes of transport
- IV. calculate plenty of time, set out early
- V. agree on a plan should you get separated while in a crowd
- VI. plan for an agree on potential emergency scenarios should you get hurt
- VII. Carry some minimal items on your person: pocket first aid including burns, marker pen, tape, water etc.
- VIII. Be identifiable, have emergency contacts cards on person.
- IX. comply as instructed by public safety and health agencies and their reps
- X. assist others if you can to help reduce potential congestion, disorder or panic but always consider your own safety - keep alert and focused, rest often, keep hydrated
- XI. Save your phone battery life: text rather than call, turn screen brightness low, keep essential calls short but keep your family friends & colleagues updated. Let them know you are safe

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- XII. Redundancy: helmets and other recreational gear can double as personal protection in extreme conditions.

#### MEDICAL EMERGENCY

- I. A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies such as cardiovascular (heart), respiratory, and gastrointestinal cannot be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from first aiders through Emergency Medical technicians, paramedics, emergency physicians and anesthesiologists.
- II. Stop Work: Abandon any plant, equipment or area immediately if a medical emergency occurs
- III. Assess the Risk: Check for Danger. Secure the area and Raise the Alarm what is the cause of the medical issue? Is it related to the work currently being performed? Has the patient been exposed to a dangerous environment (e.g. electricity, vehicle incident, fall from height) or is it due to personal health issues (e.g. heart attack, stroke), your priority should be to keep yourself and others safe. Decide if you are competent to manage the incident.
- IV. Notify: Report the incident to the site in charge immediately. They may take responsibility for managing the incident. If they are not available, contact Health, Safety, and Environment & Quality (SHEQ) Officer. If necessary, any people not involved in managing the incident should proceed to the emergency assembly area at the entrance of the site. As required, The Facility Manager or SHEQ will contact the relevant authorities immediately: Fire, Ambulance or Police. External authorities may take control of emergency response at the site.
- V. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### NATURAL DISASTER

A natural disaster is a major adverse event resulting from natural processes of the Earth like: floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover and also on the infrastructure available.

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Tornado:

- I. Small interior rooms on the lowest floor and without windows.
- II. Hallways on the lowest floor away from doors and windows.
- III. Rooms constructed with reinforced concrete, brick, or block with no windows.
- IV. Stay away from outside walls and windows.
- V. Use arms to protect head and neck.
- VI. Remain sheltered until the tornado threat is announced to be over.

Earthquake:

- I. Stay calm and await instructions from the Emergency Coordinator or the designated official.
- II. Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- III. Evacuate as instructed by the Emergency Coordinator and/or the designated official.

Flood: If indoors:

Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official. Follow the recommended primary or secondary evacuation routes.

Flood: If outdoors:

- I. Climb to high ground and stay there.
- II. Avoid walking or driving through flood water.
- III. If car stalls, abandon it immediately and climb to a higher ground.

Hurricane:

- I. The nature of a hurricane provides for more warning than other natural and weather disasters.
- II. A hurricane watch issued when a hurricane becomes a threat to a coastal area.
- III. Once a hurricane watch has been issued: Stay calm and await instructions from the Emergency Coordinator or the designated official.
- IV. Moor any boats securely, or move to a safe place if time allows.
- V. Continue to monitor local TV and radio stations for instructions.
- VI. Move early out of low-lying areas or from the coast, at the request of officials.
- VII. If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- VIII. Collect drinking water in appropriate containers.
- IX. Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- X. Leave areas that might be affected by storm tide or stream flooding.

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#### COMMUNICATION

- I. All communication to be through site in charge and External communication will be done by Cortech to media or anyother.
- II. The main channel of communication between the command center and incident command post is via telephone/ shouting.
- III. All-important contact telephone numbers, e.g. Government agencies, external bodies are displayed near the assembly point.
- IV. The security guard is responsible for taking the head count, in coordination with the hseq department.

#### EMERGENCY TEAM

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

#### MOCK DRILL'S

Regular mock drill shall be conducted as per approved emergency plan at all the above stations. Deficiencies identified & corrective action taken shall be documented. In addition to the mock drills conducted by PTT, POWERPIPE with PTT Combined mock drills shall be organized once in two months to test the efficacy of response in emergency situations. Performance & findings of combined emergency drills shall be shared & documented between the organizations to sustain emergency preparedness at the highest level.

- I. Inform all the employees about mock drill.
- II. Fix the date for mock drill.
- III. Observers will not be involved in the exercise. They will monitor the Mock drill.
- IV. Emergency Siren / alarm will be raised.
- V. After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in above.
- VI. Observer will note down the activities with respect to the time.

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#### **3.8 Shift Handovers(If applicable)**

At every shift change there shall be a time period solely dedicated for the purpose of exchanging a written and a verbal account of the previous shift's operations. It is the responsibility of the POWERPIPE Project Engineer and POWERPIPE Shift Project Engineer to ensure that there is a complete exchange of all information sufficient to allow the "oncoming" crew to safely and competently continue with the operations. The shift handover period should include [when appropriate] a complete "walk through" of the systems under test in order to identify strategic areas or points.

#### **3.9 POWERPIPE QHSE representative**

POWERPIPE project engineer shall act as POWERPIPE site QHSE representative. He shall be responsible for the overall supervision and safety of all POWERPIPE personnel on site (acting POWERPIPE site 'Health, Safety and Environmental Representative'), and will ensure all work activities undertaken are in accordance with Client / POWERPIPE approved work procedures, safe working practices and Permit to Work systems (if applicable).

#### **3.10 Risk assessments**

A Toolbox Safety Talk will be conducted on site before each new job task or section of a job procedure. All personnel participating in the works will attend, with details of the work, the hazards and the precautions being discussed. Where shift work is in operation, the Toolbox Safety Talk will be given to personnel on both shifts. The talk(s) will be logged in the Daily Operations Report.

Any changes to the scope of work must be risk assessed. Prior to implementation, the changes must be reviewed and accepted by both POWERPIPE and client.

HSE Risk Assessments identify Hazards and the degree of Risk that they pose. Assessments are carried out to indicate the control measures (safety equipment, work procedures, isolation methods, training and communication) required to reduce Risk to an acceptable level. Assessments must be carried out and approved prior to work commencing.

The Risk Assessment Analysis sheet identifies the Hazards and Hazard Effects and is used to assess the Risk as follows:

An initial Risk Factor will be obtained by assessing the severity and probability (frequency) of the harm that might arise from the Hazard.

Existing or proposed Hazard control measures will be entered against each identified potential accident. These measures should reduce the risk to an acceptable level. If the risk remains unchanged other remedial action should be specified on the sheet until it is reduced.



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### 3.11 QC Considerations

The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information as dictated in the procedure. Each task should be ticked and completed as the work progresses. During the preparation of the work or its progress, intermediate check lists, as required, will be signed off. The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information.

On completion of the works the Project Engineer must collate the completed documentation. The completed documentation will be included in the test report.

### 3.12 Management of Change

POWERPIPE operates a Safety Critical system. All 'Safety Critical' activities defined in this document are identified with the following:

STOP



The Safety Critical system is in place to ensure that all personnel are aware of critical stages as defined in this document.

Changes to procedure may be required as a result of changes in the scope of work.

Deviation from this procedure shall be subject to authorisation by POWERPIPE and PTI and shall be documented on a "Confirmation of Variation Instruction" form (Submitted only if necessary), will be used in any situation where the site works intend to deviate from the approved procedures. The POWERPIPE Engineering site representative is responsible for the development of the management of change and any associated risk assessment. The POWERPIPE Project Engineer will be responsible for compiling, logging and distributing the required forms as applicable and co-ordinating the risk assessment.

The Client representative and the POWERPIPE Project Engineer are responsible for the co-ordination and implementation of the management systems to authorize and manage changes.

### 3.13 Responsibilities

Project Personnel

Shall be familiar with all POWERPIPE Corporate and Project Quality Health, Safety and Environmental issues. They shall be responsible for identifying and reporting any non-conformance, hazards, near misses, accidents and incidents regardless of severity.

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During engineering and operational phases of the works the following categories of POWERPIPE full time personnel shall be used:

Sr.No.	Designation	No of personnel
1.	Project Manager	1
2.	Project admin	2
3.	Project Supervisor	1
4.	Welding supervisor	1
5.	Foreman	2
6.	Pipe fitter	4
7.	Welder	4
8.	Helper	6
9.	Safety manager	1
10.	Safety Officer	2
11.	Fire watcher	2
12.	Rigger	4
13.	Hot Tapping , Line Stop Operator	4
14.	Scaffolder	4
<b>Tentative number of Manpower</b>		<b>38</b>

The responsibilities of each position are as follows:

#### 1. Project Supervisor / Safety Officer

Reports to Project Manager

The Project Engineer is responsible for all operational and fiscal aspects of the Project and is empowered to make Project related decisions on behalf of POWERPIPE. He is also an In-charge of performance management of vendors.

He will also be the primary on-site point of contact for the client and be responsible for generating the appropriate documentation including but not limited to the following:

- I. Job specific procedure
- II. Daily Operations Reports
- III. Equipment and personnel time sheets
- IV. Completion certificates
- V. Tool Box Talks
- VI. JSA's

#### 2. Technician/Operator

Reports to the Project Engineer

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- I. The Operator's responsibilities include the safe and efficient operation of equipment and assisting in the compiling of clear and concise records of operations.
- II. Pro-actively contributing to the overall site safety by reporting near misses and accidents to the site Project Engineer.

**3. Inservice Welder**

- Reports to the Welding Engineer
- I. The welder responsibilities include the safe and efficient inservice welding as per approved WPS in coordination with API-1104.

Refer Annexure

General Information

The client reporting and investigating procedure will take precedence in the event of an emergency. However, any incidents involving injury to POWERPIPE personnel, damage to equipment, or high potential "Near Misses" will also be reported through POWERPIPE own reporting system, the Global Crisis Management plan.

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# 4.0 OPERATIONAL REQUIREMENTS

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#### 4.1 Pre-Job Safety Meeting & Toolbox talk

Prior to starting operations, the POWERPIPE Project Engineer and the Client Representative will hold a pre-job safety meeting. This meeting shall be attended by all relevant personnel and the forthcoming operations discussed. The following items should also be noted:

- All non-essential personnel will be excluded from the operation area.
- Heavy lifts are not permitted over POWERPIPE Equipment during Hot Tapping operations.
- POWERPIPE and operational personnel have checked the escape routes and made contingency plans.
- Adjacent systems shall be configured so that pressure cannot accumulate.
- Project Engineers to conduct formal shift handover.
- In addition to the above, toolbox talks will be held prior to any task/operation commencement. All personnel involved in operations will attend.
- The Project Engineer will brief all operatives in the ensuing operations, risk assessments reviewed and all necessary safety precautions discussed.
- Work permits to be signed off accordingly per shift.

#### 4.2 System & Equipment Preparation

Pre-mobilisation and post-mobilisation (i.e. all Hot Tap and line stop Equipment along with its related accessories should be tested prior to mobilisation from POWERPIPE work base and on site prior to commencing operations) checks & function tests will be carried out to ensure that the equipment supplied for the project is suitable for the work scope. All equipment will be calibrated and fully certified. In addition, all fittings/connections/adapters on POWERPIPE equipment and PTT owned Equipments will be inspected upon completion of equipment being set up on location.

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#### 4.3 Method Statement for In-Service Welding, Hot Tapping & Line Stopple Plugging.

##### IN-SERVICE WELDING

##### 4.3.1 General

- There are 2 primary concerns with welding onto in-service pipelines. The first concern is to avoid "burning through" where welding arc causes the pipe wall to be breached. The second concern is for hydrogen cracking, since welds made in-service cool at an accelerated rate as the result of the flowing contents ability to remove heat from the pipe wall
- Burning through is unlikely if the wall thickness is 6.4 mm. or greater, provided that low-hydrogen electrodes (EXX18 type) and normal welding practices are used.
- Electrodes shall conform to AWS A 5.1/AWS class Ex16 or Ex18 basic coated low-hydrogen electrodes shall be specified in the Welding Procedure Specification.
- Electrodes shall be stored in accordance the Manufacture's instructions in their original containers, which shall be marked with the Manufacture's name, the consumable trade name, and the batch number.

##### 4.3.2 Qualification of Welding Procedures

- Approved Welding Procedure Specification (WPS) & Procedure Qualification Record (PQR) shall be submitted which tested and qualified in accordance with API 1104 Appendix B.

##### 4.3.3 Work preparation of welding and testing of Split tee

###### ➤ Surface cleaning

- Mark the desired location of the hot tap fitting.
- Clean the existing pipe in the area to be inspected to bare metal by mechanical means to remove all coatings, dirt, grease and other contaminants. Necessary precautions need to be taken not to remove the parent metal during cleaning.

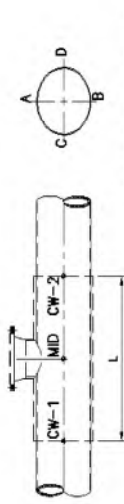
###### ➤ Visual inspection & defect check of area to be welded

- The section of the run pipe to which the branch pipe or fitting is to be attached shall be thoroughly cleaned with a wire brush for a distance extending to a minimum of 150 mm either side of the branch or fitting. After cleaning, the run pipe shall be visually examined for laps, cracks, pitting or other form of damage. The fitting shall be located so as to avoid welding on minor flaws in the run pipe.
- Visual examination of non-existence of Pitting and corrosion on the selected area for Hot Tapping

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- For full encirclement tees or sleeves, the run pipe shall be measured with callipers to ensure that ovality is acceptable for accommodation of the proposed tee or sleeve as below picture, ovality of each direction shall not be over 3 mm to avoid gap of split tee and run pipe

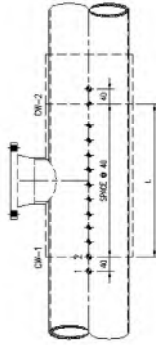


POINT	A-B	C-D
CW-1		
MID		
CW-2		

#### ROUNDNESS RECORD

#### ROUNDNESS MEASUREMENT

- The specific areas of the run pipe where attachment welds are to be made shall be ultrasonically examination the actual wall thickness for every 40-50 mm intervally, the minimum actual wall thickness shall be used for heat input calculation



THICKNESS ON LONGITUDINAL

POINT	1	2	3
LW-1			
LW-2			

THICKNESS ON CIRCUMFERENCE

POINT	A	B	C
CW-1			
CW-2			

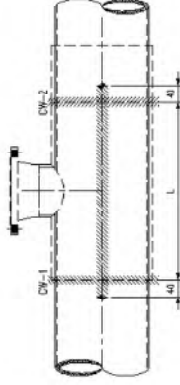
#### ACTUAL WALL THICKNESS VERIFICATION

- Radiographic Testing for pipe seam verification  
Existing pipe must be verified for seam position by radiographic test ting (RT). Seam of pipe shall not locate near the pilot drill, distance of pipe seam shall be 2 inch away from edge of pilot drill

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- Ultrasonic examination shall be examined to ensure freedom from lamination



POINT	ACCEPT	UNACCEPT
CW-1		
CW-2		
LW-1		
LW-2		

LAMINATION FREE SCAN AREA

#### LAMINATION FREE SCAN OF AREA WHERE ATTACH WELDMENT

#### Alignment and welding practices

#### Offset

- Pre-assembly of fitting on existing pipe shall be verified to ensure the curvature of fitting and pipe surface is within tolerance.
- The offset between the abutting edges for Groove welds should not exceed 1.6 mm. to obtain this alignment, devices should be used, or misaligned surfaces can be built up with weld metal.
- 2 sets of chain blocks shall be used to achieve an offset up to a maximum of 1.6 mm.

#### Root Opening

- The two halves of fitting should be clamped together around the pipe.
- Before the fitting is finally clamped together, Carbon steel backing strips shall be inserted into the machined recesses at the roots of longitudinal welds.
- The backing strip material shall remain within the essential variables of welding procedure qualification.
- The backing strip extension beyond the edges of the fitting shall be a minimum of 150 mm to allow attachment of suitably size run-on/run-off plates.
- Before the fitting is clamped, all visible surface grease in and around the recess of the branch flange, backing strip shall be removed by solvent cleaning.

#### Bevels

- Dye Penetrant Testing shall be performed on the bevels.



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- Immediately prior to welding, the fusion faces and the adjacent material shall be free from planar defects, tears, moisture, scale, rust, paint, grease or other matter.

- Cleaning area shall extend to a minimum of 25 mm from the edge of the fusion faces on both the internal and external surfaces of the fitting.

- Where the fitting thickness is greater than twice the run pipe wall thickness, the fitting shall be chamfered at 45 degree to enable fillet weld leg lengths of two times the run pipe wall thickness, see Figure 5

#### ➤ **Cleaning:**

- Each run of weld metal shall be thoroughly cleaned with hand or power tools before a further run is applied.
- Visible flaws such as cracks, cavities and other deposition faults shall be removed before deposition of further weld metals.

#### ➤ **Fit-up**

- A Yoke-type clamp or chain blocks shall be clamped around the circle of run pipe. Maximum gap between ID of split Tee fitting and OD of the run pipe should be: max 3.2 mm
- Longitudinal groove welds, Max Gap not exceeds 5 mm, along the longitudinal bevels.
- Circumferential fillet welds Max. Gap not exceeds 1.6 mm, around circle of run pipe.
- Verify that the axial centerline of the Tapping path intersects the axial centerline of the run pipe at right angles.
- Maintain a positive support of the Tapping fitting especially the flange alignment.

#### ➤ **Tack welding:**

- Tack welding is recommended the circumferential should be done on the sequence of opposite sides such as 12 o'clock & 6 o'clock, 3 o'clock & 9 o'clock (or equivalent to avoid longitudinal groove ends position)
- Number of Tack welds the longitudinal should be available on qualified welder skill.

#### ➤ **Welding Sequence:**

##### a) General

- Prior to start welding, Customer to confirm that the flow rate of the line being weld shall not be less than 0.4 m/s
- The welding sequence for split tees shall be shown in Figure-1.

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#### b) Longitudinal groove welds (LW-1 & LW-2)

- Using 2 two welders where the fitting is 750 mm or more in length, weld both longitudinal seams simultaneously. Start the welds from the center of the fitting in opposite directions and progress to the ends.
- Repeat this step, staggering the start/stops, until the seams are 1/3 of the cross-sectional area of the welds.
- Complete the longitudinal seams until full of the cross-sectional of the welds. This can be accomplished using one or two welders, which welding may progress in the desired direction or from one end to the other.

#### c) Circumferential fillet welds (CW-1, CW-2)

- Circumferential welding shall only commence after completion of longitudinal welds.
- Circumferential tack shall be removed after completion of longitudinal welds.
- The welds bead deposition sequence shall be welded as shown in passes sequence of Figure 2
- The second circumferential fillet weld shall only be started after completion and cooling of the first fillet. At no time shall circumferential fillet welds be attempted simultaneously.

#### d) Buffering for circumferential fillet welds

- Buffering technique shall be used on the run pipe wall as shown in the passes 1 – 3 of Figure 3. Additional reinforcement shall be applied over the buffering layer where the gap between the fitting and run pipe exceeds 1.5 mm, as shown in passes 4 & 4 of Figure 4.
- The first buffering pass shall be deposited as close as possible to the fitting without impinging or making ant attachment to it.
- The fillet leg length and gap between the pipe and fitting shall determine the number buffering passes required. Pass 6 or its equivalent without impinging on the run pipe wall.

#### ➤ **Number of welders :**

- Longitudinal groove welds where the fitting is 750 mm or more in length, at least 2 welders shall work on each seam (if site condition is applicable).
- Circumferential fillet welds on pipe of 323.9 mm (8 ") OD and larger, 2 welders shall be employed working on the opposite sides of the pipe (if site condition is applicable). At no time shall the welders' weld pools have less than 50 mm separation.

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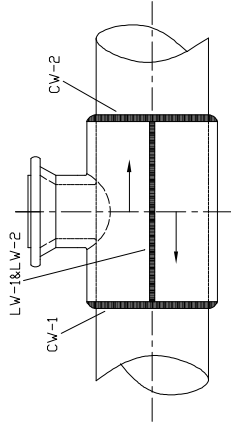


Figure-1 Encirclement Split Tee fitting Welding sequence

NOTE: Welding of longitudinal welds to commence in the center of tee. Weld starts shall be overlapped and ground. Welding to continue in this manner until 10 mm to 12 mm in cross sectional thickness is deposited.

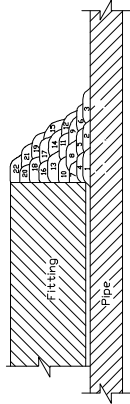


Figure 2 Weld bead deposition sequence

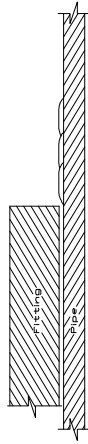


Figure 3 Detail of buttering layer onto pipe

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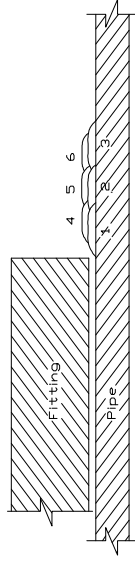


Figure 4 Suggest method of reducing gap between pipe and fitting before welding to fillet throat

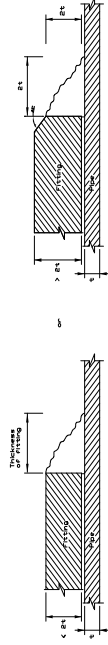


Figure 5 Dimension of fillet leg length to suit thickness of fitting

- **Alignment and welding practices for O-let fitting**
  - Maintain gap between 2-3 mm. for complete joint penetration of root pass
  - The welding sequence shall be shown in Figure-6

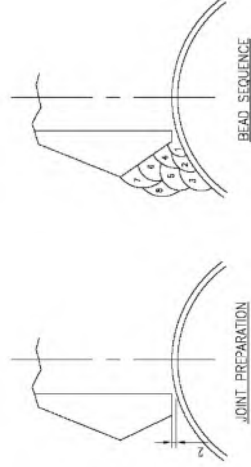


Figure 6 : Alignment and welding practices for branch nozzle with O-let fitting

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#### 4.3.4 INSPECTION AND TESTING

- **Visual inspection:**
  - All welds shall be inspected by visual inspection during and after welding to ensure that slag is removed between passes.
  - Undercutting shall be treated by grinding and blending provided that the specified minimum wall thickness for the pipe and fitting are maintained.
- **Non-Destructive Testing:**
  - **Root pass :** for both groove weld and fillet weld prior to deposition of further weld metal shall be performed Magnetic Particle Testing on the completed of The root pass
  - **Hot pass :** for both groove weld and fillet weld Every layer of hot pass shall be performed Magnetic Particle Testing
  - **Finished pass :** The completed assembly welds shall be magnetic particle inspected not sooner than 24 hours after completion of the joint.

#### ➤ **Sequence of weld Beads Inspection Testing Table** Groove Weld No. LW1 / LW2 (Longitudinal Weld)

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X		X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	

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#### Circumferential Weld / Fillet weld

Sequence		Electrode	Dia. (mm.)	Processes	Inspection				Note
No.	Beads				VT	PT	MT	RT	
1	Root Pass	ER70S-G	2.4	GTAW	X	-	X	-	
2-n	Hot Pass	E7018	3.2 – 4.0	SMAW	X	-	X	-	Every 2 layers
n+1	finished	E7018	3.2 – 4.0	SMAW	X	-	X	-	MT Delay crack

#### ➤ **Strength Test Pressures:**

- The test pressure will depend on the actual internal pressure of the run pipe at the time of the hot-tap and the ability of the run pipe to withstand external pressure.

#### ➤ **Pressure Test:**

- For split tees, the maximum allowable pressure differential ( $\Delta P$ ) with respect to buckling of the run-pipe calculated as defined in ASME VIII, Division 1, Section UG-28.
- Therefore  $PT = PA + \Delta P$   
Where  $PT$  = test pressure And  $PA$  = actual operating pressure in the run-pipe

#### ➤ **Testing Media:**

- Where practical, the testing medium shall be water. In some applications where it is desirable to avoid water in the split-tee annulus, the use of liquid hydrocarbons may be suitable, subject to acceptable safety precautions. For the condition of operating temperature higher than 100 C, hot oil shall be used for testing.

#### ➤ **Testing Duration:**

- Testing of branch connection, with the valve installed and in the open position, to demonstrate leak tightness and strength. Duration should be at least 15 minutes.

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### 1. Welding Hot Tap, Line Stop Fittings and Its Accessory Fittings into 24" Header Line.



- Experienced In-service welders qualified should be deployed to execute the welding of fittings.
- Pipe line should be exposed and all painting should be removed at Marked location where Hot Tapping Operation need to be carried out.
- Thickness survey and Ultrasonic Lamination Check of the pipeline areas where Hot Tap Fitting to be welded will be conducted by a certified testing agency.
- UTL reports will be reviewed by the PTT Representative and Approval/permit for taking up the welding activities will be issued by the same.
- One number of **24"x24"x300# Hot Tap Fitting along with 24" x300# Full Bore Gate Valve** , **24"x24"x300# Line Stopple Fitting , 24"x2"x300# TOR Fitting , 24"x4"x300# Weld-olet Fitting** is welded where UTL is carried at Upstream and Downstream Locations.
- **All welding shall be as per API 1104 Appendix B.**
- A Minimum flow shall be maintained during welding to dissipate the generated heat during welding.
- At No-Flow condition the cooling rate of each weld bead is noted and its ensured that there won't be any temperature buildup in the weld area. Once after confirming the same the welding activities are proceeded.
- Temperature of weld areas are regularly noted using calibrated Temperature Measuring instrument.
- Non-destructive tests (NDT) shall be done, during and after welding as specified in the approved WPS.

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### 2. Sandwich Valve / Isolation Valve Installation



- 24"X 600 # Sandwich Valves along with 24"x600# /24"x300# Reducer Spool are installed upon the Line Stop fittings.
- 2"X 300 # Ball Valves are installed upon the Pressure Equalization fittings.
- 4"X 300 # gate Valves are installed upon the Vent fittings.
- It's made sure that the valves are full bore and 100 % open.

### 3. Hot Tapping Operation and Installation of 24" Permanent Bypass Line





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### 3.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance, machine travel and machine capability in accordance to the Hot tap Data Sheet to be furnished by Customer .
- Pressure testing of Hot-tapping machine.

### 3.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or International; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre tested ANSI class FULL BORE ID gate valves furnished by Contractor or Owner
- Demonstrate of hot tap equipment to customer satisfactory

### 3.3 Remove blind flange.

- Check raised face of the Hot Tap Fitting Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.

### 3.4 Clean valve faces & Install Full bore ID Tapping Valve:

- Install new gasket on all connection
- Lower valve into the fitting slowly, keeping stud free in flange bolt holes.
- Open Tapping valve and align bore of valve with bore of the fitting as near perfect has possible.
- Install studs & nuts and tighten evenly using the proper sequence
- Take required Tapping measurement

### 3.5 Check Tapping Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.

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- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Measure valve for sufficient housing space for cutter and pilot. Face of valve to seat rings. Record this dimension.

### 3.6 ASSEMBLE THE TAPPING MACHINE:

- Check boring bar drive ring for tightness and damage.
- Check the retainer shaft packing nut. Packing nut must not extend out onto the taper of the boring bar.
- Clean ring joints and steel ring gasket.
- Install adapter on tapping machine adapter and snug the top two bolts, leaving others loose.
- Extends the boring bar beyond the face of the adapter. Install the cutter holder in the boring bar. Tighten the retainer shaft with the measuring rod. Install the safety pin with cutter pins on both ends.
- Check cutter teeth and outer diameter of the cutter, install cutter on cutter holder and tighten the socket head bolts and lock nuts. An acceptable alternative is to assemble the cutter and the cutter holder before installing the cutter holder in the boring bar.
- Check the U-roads, pilot drill, and nylon lock pin in pilot. Then install pilot in the cutter holder and tighten.
- Align the adapter with the cutter and tighten adapter bolts. For alignment reference, measure from the outer diameter of the cutter to the outer diameter of the flange raised face. Rotate the cutter 180 degree and recheck the alignment. If alignment changes when the cutter is rotated check the cutter, cutter holder, and boring bar for damage.
- Retract the boring bar and cutter all the way. Take measurement with the measuring rod.

### 3.7 CALCULATE THE TAPPING DISTANCE:

- Measure the distance from the pilot tip to the face of the adapter (Measurement A).
- Measure distance from top of the valve to the top of the pipe wall (Measurement B).
- Calculate distance the pilot and the cutter must travel to complete the tap after the pilot contacts the pipe wall (Measurement C) .
- If the pilot is inside the adapter , total of A+B equals the distance the pilot must travel to contact the pipe.
- If the pilot tip extends beyond the face of the adapter, total of B-A equals the distance the pilot must travel to contact the pipe wall.
- Measure the distance the pilot tip extends beyond the cutter teeth.

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		<h3>Hot Tapping Measurement Card for 24"x20"</h3>	
Header Pipe OD	.....	Date	.....
Branch Size	.....		
Pipeline Thk	.....		
Cutter OD	.....		

$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{OD}}{2} \right)^2 - \left( \frac{CUTTER_{OD}}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref. Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel , Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + Ref1 + 1/8"$

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		<h3>Hot Tapping Measurement Card for 24"x24"</h3>	
Header Pipe OD	.....	Date	.....
Branch Size	.....		
Pipeline Thk	.....		
Cutter OD	.....		

$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{OD}}{2} \right)^2 - \left( \frac{CUTTER_{OD}}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref. Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel , Lower-in +C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + Ref1 + 1/8"$

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### Hot Tapping Measurement Card for 24"x2"

Header Pipe OD : .....

Branch Size : .....

Pipeline Thk : .....

Drill Bit Dia : .....

Date : .....

$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{ID}}{2} \right)^2 - \left( \frac{DRILL_{OD}}{2} \right)^2 \right]^{1/2}$$

A Top of the Valve to Top of the Pipe	
= Lower-in Distance	
C <sub>1</sub> Tapping Distance from Calculation	
Total Travel : Lower-in + C <sub>1</sub>	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + 1/8"$

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### Hot Tapping Measurement Card for 24"x4"

Header Pipe OD : .....

Branch Size : .....

Pipeline Thk : .....

Cutter OD : .....

Date : .....

$$C_1 = \left( \frac{PIPE_{OD}}{2} \right) - \left[ \left( \frac{PIPE_{ID}}{2} \right)^2 - \left( \frac{CUTTER_{OD}}{2} \right)^2 \right]^{1/2}$$

A Pilot to Face of Adaptor	
+B Top of the Valve to Top of the Pipe	
= Lower-in Distance	
Ref, Pilot to Cutter	
C <sub>1</sub> Tapping Distance from Calculation	
C C <sub>1</sub> + Ref	
Total Travel : Lower-in + C	
Max. Tapping Distance	

Max. Taping Distance = Lower-in Distance +  $\left( \frac{PIPE_{OD}}{2} \right) + Ref + 1/8"$

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### 3.8 Install Tapping Machine on the Tapping Valve.

- Align bolt holes on the flanges.
- Install bolts and tighten evenly.
- Install bleeder valve and leave it open.

### 3.9 Perform leak test of machine assembly & Operational check

- Pack Nitrogen into machine set-up to displace any possible pressure of air in between tapping machine, adapter, valve and fitting and pressure test (Leak Test) assembly to customer specification to ensure bubble tight seal on all bolted connections prior to any hot tapping.

### 3.10 Hot Tapping Operation -

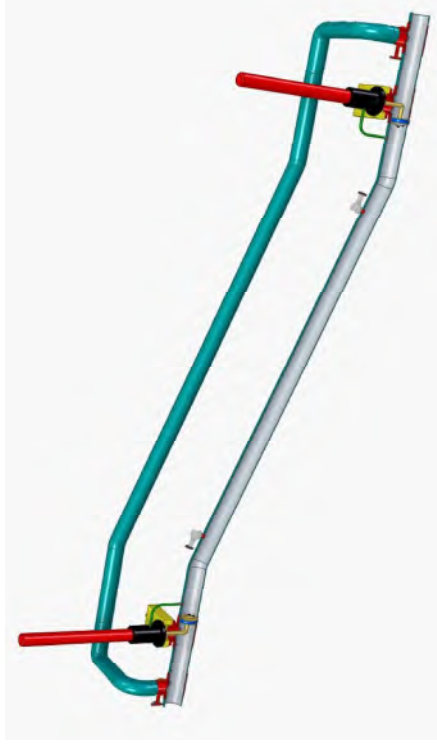
- Take all the required measurements, record them on measurement card and mark the same on measuring rod.
- Calculate the cutting distance and time required for cutting.
- Re-check number of 'U' rods coming under the span of calculated cutting distance.
- Re-check that boring bar is fully retracted.
- Assemble the Hot tapping machine on the Gate Valve.
- Close the isolation valve (Count and record the number of turns).
- Check for alignment in all directions and tighten the bolts.
- Open the Isolation Valves (Count and record the number of turns).
- Open the bleeder valve and ON the nitrogen supply.
- After few minutes, CLOSE the bleeder valve and raise the pressure as required by test norms **(Generally 1.1 times the working pressure).**
- Leave the set-up pressurized for 15 minutes; Check all flange and threaded joints for any leakage using soap solution or any other approved method.
- LOWER-IN the boring bar manually as per measurement (By turning the crank handle clockwise) till you feel that Pilot drill has touched the top of the pipe, and cross check with measuring rod.
- Retract the boring bar 3 to 4 turns (turn anticlockwise).
- Engage the power source with machine drive.
- Open the Tapping machine control valve.
- Complete the pilot drill (According to measuring rod), also can be verified by checking the rise or drop in pressure gauge fitted.
- Once the pilot is complete, Close the machine control. Disengage the machine from power source and drive the boring bar manually till the cutter touches the top of the pipe (check the marked indications on measuring rod) also can be re-checked by one's feel.
- Retract 3 to 4 turns and engage the power source with machine drive, Open the Tapping machine control valve.

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- Complete the tapping (According to measuring rod).
- Once the Tapping is complete, close the machine control, Disengage the machine from power source and drive the boring bar manually for 1/8".
- Just open the machine control and rotate the boring bar (Cutter) without engaging the clutch for few minutes to ensure that coupon is free.
- Close the machine control, OFF the power source.
- Retract the boring bar manually till initial reading (marked on measuring rod).
- Close the isolation valve (cross check the 100% closing by counting the number of turns); open the bleeder valve to drain out the product remaining in the machine housing.
- Once draining is complete, remove the Hot tapping machine and handover the coupon to PTT.
- Cut the 24"WNRF Flange from the Hot Tap Fitting and Weld the New Permanent Bypass line **(Hydrotested)** at Upstream and Downstream Locations.
- Above Procedure is to be repeated for carrying Hot Tapping on 24"x24"x300# , 24"x2"x300# , 24"x4"x300# Fittings at Upstream and Downstream Locations.

### 4. LINE STOP PROCEDURE



### 4.1 Pre-Mobilization Preparation of hot tap equipment

- Checking, confirmation & selection of all necessary Hot tap equipment & accessories required for the job, taking into the consideration of the Space allowance for Machine set-up clearance,



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machine travel and machine capability in accordance to the Hot Tap Data Sheet to be furnished by Customer

- Pressure testing of Hot-tapping/Line Stop machine.

#### 4.2 Discussion with pipeline owner, contractor

- Discuss the job and safety requirements to assure complete understanding of what is to be accomplished and how. Check the job location for equipment clearance and handling
- Verify the line content, pressure, temperature, pipe wall, flow rate & direction of flow.
- Discuss what items will be needed to complete the job : OSHA or International; or owner specified, approved lifting equipment, supervised labor, gasket, fasteners , blind flanges, OSHA or owner specified , approved scaffolding, or in accordance with local safety regulations, proper support of the pipe, fitting and Hot Tapping / plugging equipment.
- Confirm valve data, dimensions, on pre-tested ANSI class full bore valves

#### 4.3 Remove blind flange.

- Check raised face of the Line Stop Flange
- Built support where necessary, beneath the Fitting to support weight of the equipment
- Check gasket so that no part will extend into the bore of the valve.

#### 4.4 Check Isolation Valve.

- Check valve bore and the nozzle for alignment.
- Check the flange makeup for the bolts and the gasket and be sure bolts have been tightened.
- Measure valve bore for sufficient cutter clearance. Record this dimension. Check to make sure valve will open and close properly.
- Assembly line stop machine with plugging head.
- Customer to confirm the velocity in line prior to line plugging.
- Install Line Stop Machine on Sandwich valve , Pressure Equalization need to be carried out using 2" TOR Fitting .
- After the Pressure is equalized , Open the Sandwich Valve Gate.
- Set plugging head into the line. ( **Always Downstream Plug to be set first**)

**NOTE: Pressure, flow rate, velocity will be considerations to look into and discuss/verify with the customer prior to job commencement.**

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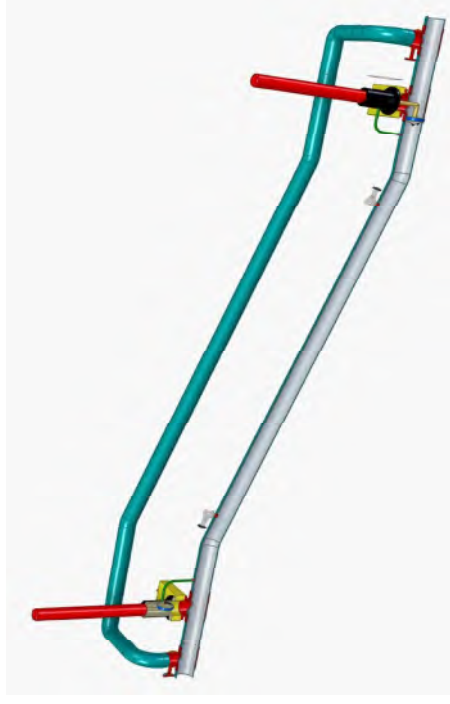


Fig. Insertion of Downstream Stopple Plug into Pipeline.

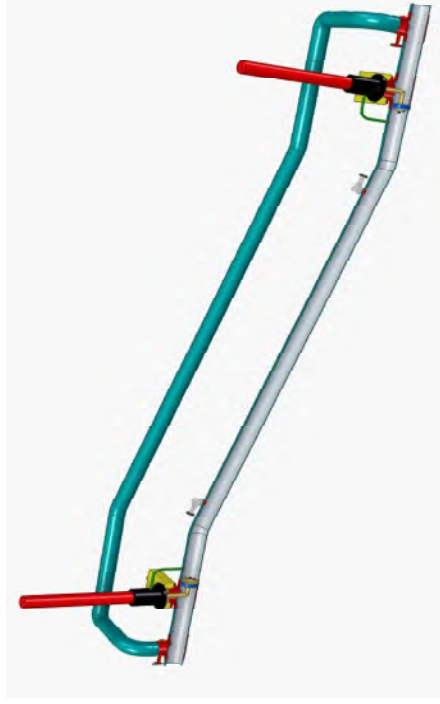

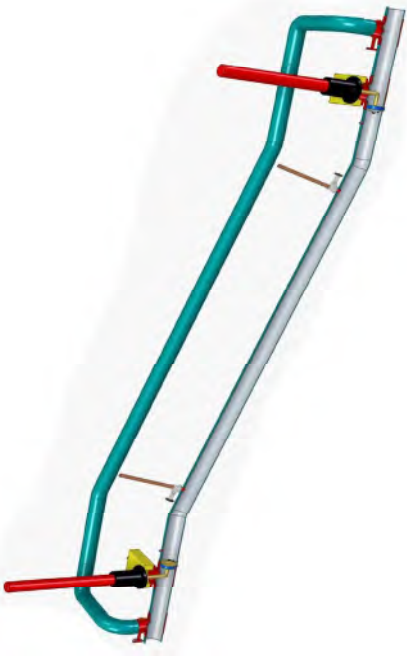





Fig. Insertion of Upstream Stopple Plug into Pipeline.

#### 4.5 Relieve pressure in isolated section and check for seal integrity.

- After plugging machine is set, close the 2" Pressure equalization valves , Dismantle the Hose.
- Isolate the Section using 4" weld-olet fitting.
- The Stopple Seal Integrity can be verified during this stage using Pressure Gauges .

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<ul style="list-style-type: none"><li>Monitoring pressure at downstream portion for 0.5 hours, if there is no pressure built up customer is able to perform pipeline modification works.</li><li>Dead Section is subjected to Nitrogen Purging , then Cold Cutting is carried out.</li></ul>				
				Fig. Venting of Isolated section using 4" Weld-onlet Fitting.
				Fig. Cold-Cutting of Header Pipe.

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<b>4.6 Proceed to Remedial work &amp; Re-Commissioning of 24" Header Line.</b>				
<ul style="list-style-type: none"><li>• Gas Check</li><li>• N2 purging if required</li><li>• Cutting undesired portion.</li><li>• Welding of Dish Ends &amp; golden joints of Live Section are subjected for Radiographic examination at Upstream and Downstream Location.</li><li>• After the Successful NDE results , the Header line is re-commissioned using 2" TOR Fitting.</li></ul>				
				Fig. Welding of Dish Ends into the Live and Dead Section , Pressure Equalization for Stopple Plug Retrieval.
<b>4.7 Stopple Plug Retrieval and Dismantling of Stopple Assembly.</b>				
<ul style="list-style-type: none"><li>• After pressure equalization, Upstream Stopple Plug is retracted first , then Downstream Stopple is retracted.</li><li>• Close the Sandwich Valves and 2" Equalization valves .</li><li>• Open bleeder valve to relieve trapped pressure in Stopple Housing , Dismantle the Stopple Housing Assembly.</li></ul>				

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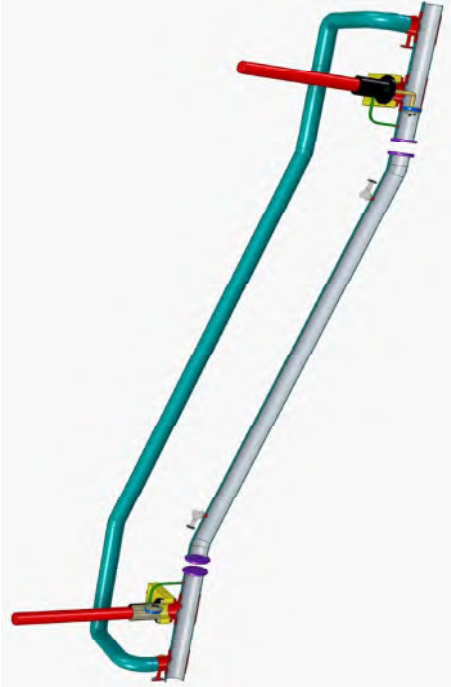


Fig. Upstream Stopple Plug Retraction

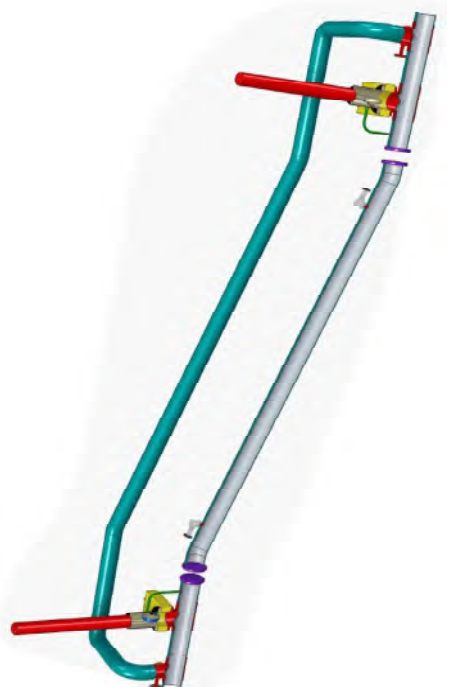


Fig. Downstream Stopple Plug Retraction

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### 4.8 Temporary and Permanent Line Blinding.

- Check OD of LOR plugs.
- Install plug and plug holder to tapping machine.
- Clean, check for damage and lubricate.
- Install the tapping machine on Sandwich Valve , Equalize the Pressure , below and above the Sandwich Valve Gate.
- Open the Sandwich valve.
- Extend to insert special LOR Plug into set position, engage segments in LOR flange and fully retract boring bar.
- After the completion Plug is installed , Release the trapped pressure in the adaptor using bleeder valve , and check for any pressure build up above the completion plug.
- Once no pressure build up found , Dismantle the Tapping machine assembly and 24" Split-Tee are permanently blinded by installing BLRF Flangesat Upstream and Downstream Locations.
- 2" TOR is temporarily blinded with Brass plugs and Permanently blinded with end caps tack welded.




Fig. Permanent Line Blinding using Completion Plugs and Blind Flanges



PTT PUBLIC COMPANY LIMITED

โครงการพัฒนาระบบท่อส่งก๊าซธรรมชาติ เพื่อลดผลกระทบจากโครงการความร่วมมือระหว่างรัฐบาลไทยและบริษัท ปตท. จำกัด (มหาชน) ในการพัฒนาระบบท่อส่งก๊าซธรรมชาติ (ระยะที่ 1 ช่วงกรุงเทพ - นครราชสีมา) สัญญา 4-2  
(RE-ROUTE PTT PIPELINE HSR 4-2)

DOCUMENT TITLE:	HOT TAP TIE-IN AND HOT TAP STOPPLE PLUG PROCEDURE (SCOPE#4)
DOCUMENT NO.:	PR-D-2102.18-6173-003      REVISION: 0

REVIEW STAMP	COMMENTS
<input checked="" type="checkbox"/> E : Approved for Construction.	
<input type="checkbox"/> F : Work may proceed. Submit for Construction	
<input type="checkbox"/> G : Revise and Resubmit. Work may proceed subject to incorporation of changes indicated.	
<input type="checkbox"/> H : Revise and Resubmit. Work may not proceed.	
<input type="checkbox"/> I : Review not required. Work may proceed.	
Name : _____	
Sign : _____ Date : _____	

0	18-Apr-22	Issued for Construction	AKK	YI	PT
A	06-Apr-22	Issued for Approval	KA	YI	PT
Rev.	Date	Description	Prepared By	Checked By	Approved By
CONTRACTOR: SIAMRAJ PUBLIC COMPANY LIMITED					




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# 1 INTRODUCTION

## 1.1 General information


This document covers the safe working practices for the execution of Hot Tapping and Line Stopple Plugging operation Including In-service welding works.

It is the responsibility of POWERPIPE project execution team and shall be adhered to all personnel involved with the operation.

The purpose of the project is to "RE-ROUTE PTT PIPELINE HSR 4-2".

## 1.2 Abbreviations and Definitions

Terms	Definition
Ps(a),Ps(g)	Pressure in Psi, absolute and gauge
Owner/Client	PTT
Main Contractor	Siamraj PCL.
Hot tap Contractor	POWERPIPE CO., LTD.
HSE	Health, Safety, and Environment
JSA	Job Safety Analysis
m.	meter
m3	Cubic meter
MSDS	Material Safety Data Sheet
N/A	Not applicable
OEM	Original Equipment Manufacturer
P&ID	Piping and Instrumentation Diagram
PPE	Personal Protective Equipment
PSV/PRV	Pressure Safety Valve/Pressure Relief Valve.
PTW	Permit to Work System
Rev	Revision
Scf.	Standard Cubic Foot
FTM	Free Issue Material

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## Project

Re-route PTT pipeline HSR 4-2

### Hammmable Service

A fluid which, under expected operating conditions, is a vapour or produces vapours that can be ignited and continue to burn in air

### Hazardous Substance

Included, but not limited to, those substances that are explosive, combustible, toxic or corrosive

### Hot Tapping

The technique of attaching a mechanical or welded branch fitting to piping or equipment in service, and creating an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting.

### Gate Valve

A gate valve, also known as a sluice valve, is a valve that opens by lifting a barrier (gate) out of the path of the fluid. Gate valves require very little space along the pipe axis and hardly restrict the flow of fluid when the gate is fully opened. The gate faces can be parallel but are most commonly wedge-shaped (in order to be able to apply pressure on the sealing surface)

### Manufacturer/Vendor

The party which manufactures and/or supplies equipment, technical documents/drawings and services to perform the duties specified by the POWERPIPE

### On-Plot Piping

Pipe system designed in accordance with ASME B31.1, ASME B31.3 (see Note below)

NOTE: Some parts of a pipeline system, although located "off-plot", may be designed in accordance with ASME B31.3. For the purposes of this specification, such piping shall be considered to be On-plot. Similarly, some refinery piping, although physically located "on-plot", may be designed in accordance with ASME B31.4 or B31.8. For the purposes of this specification, such piping shall be considered to be Off-plot

### Operating Conditions

All conditions of piping and equipment when containing hydrocarbons under a positive internal pressure

### Run-Pipe

The existing pipe into which a Hot-Tap is to be made

### Shall

Indicates a mandatory requirement

### Should

Indicates a strong recommendation

### Site

Any place where the facilities will be reinstated, constructed and/or installed

## 1.3 Pipeline Data Sheet

Main Pipeline Size	12 Inch
Wall Thickness	0.406"
Pipeline Material	Carbon Steel
Orientation Of Pipe	Horizontal



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Service Fluid Natural Gas  
Design Pressure 720 Psi  
Operating Pressure ( Max/Min) 460 Psi  
Design Temperature 176 Deg. Far.  
Operating Temperature 77 Deg. Far.  
Branch Size for Hot Tapping 12 Inch  
Branch Size for Line Stopple Plugging 12 Inch  
Orientation of Tap 12 – O' dock position  
Valve Type 12" X 300 # Sandwich Valve ,12" X 300# Full Bore ball Valve.  
Fitting Type Fully Encirclement Split Tee

#### 1.4 Communications

Throughout the Project communications should be maintained between POWERPIPE Operations Manager and PTT, EIC. If communications fail at any given time, the operation shall cease until communications are re-established.

#### 1.5 References


1. API RP 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries
2. API 1104 Welding of Pipelines and Related Facilities
3. ASME B31.8 Process Piping
4. ASME B16.5 Steel Pipe Flanges & Flanged Fittings
5. ASTM A106 Standard Specifications for Seamless Carbon Steel Pipelines
6. API 5L Specification for line pipe.
7. ASME B 16.25 : But Welding Ends.
8. MSS-SP44 Steel pipeline flanges
9. ASME Sec.VIII : Boiler & Pressure Vessels Code-Rules for the construction of pressure.
10. ASME Sec. V: Non-destructive examination.
11. ASME Sec. IX: Welding.
12. ASME Sec. VIII Div.1 & 2: Fabrication.
13. ASTM A694: carbon and alloy steel forgings for pipe flanges, fittings, valves, and parts for high pressure transmission service.

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## 2 SCOPE OF WORK

This document gives the detailed requirement to be covered the task as listed below:

1. Existing pipe wall thickness check (See PAE-UTM-008)
2. U.T. Lamination checking of pipeline (See PAE-UT-004)
3. Pipe seam verification (See PAE-RT-001)
4. Roundness checking
5. Fitting installation
6. Welding
7. Inspection and testing
8. Hot tap operation
9. Line stop Operation
10. Pipeline modification
11. Completion plug installation

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### 3 HEALTH, SAFETY & ENVIRONMENT

A copy of the POWERPIPE Health, Safety and Environmental Management Systems Manual will be kept on site and is available for review by PTT.

The standards and safe working practices outlined in this document will be adopted and referred to throughout POWERPIPE operations on site.

All work will be carried out in accordance with the PTT and the POWERPIPE QHSE Plan.

Every day recording of the manpower available at site before start of the work to be carried out.

#### 3.1 HSE Considerations

Safety is the responsibility of every employee irrespective of status. Employees will ensure that their workplace is safe and functions efficiently and safely. Common sense should be applied for 'safe working' practices to be implemented and adhered to at all times. Particular attention will be given to work site safety and to any safety systems and procedures provided. POWERPIPE to complete any Client site specific safety training and site orientation prior to commencing site activities.

Personal Protective Equipment (PPE) will be issued to all personnel. The minimum PPE of hard hat, safety boots, full length coveralls, gloves and eye protection will be worn at all times when working on site.

Barriers will be erected in order to ensure that unauthorised personnel do not enter the worksite, and tannoy announcements will be broadcast to warn personnel of any operations that require the worksite to be barriered off.

All Hot tap and line stop equipments along with its accessories will be checked to confirm that they are of a suitable pressure rating for the task. All air hoses will and be secured with whip-checks & R-pins.

On completion of the work scope, and prior to demobilisation, any equipment which is damaged or faulty will be clearly red tagged and an equipment damage report will be completed.

Any equipment which may contain residual chemicals will be clearly tagged, and the base will be made aware of these items prior to the items being demobilised.

#### 3.2 Safety Systems

The worksite Permit-to-Work system will be implemented and strictly adhered to at all times. No work will be carried out unless the required Permit has been raised, authorised and signed on. If the scope of work changes during the duration of the Permit, the POWERPIPE Project Engineer will ensure that any changes to the work are discussed with (Company and Client), and the permit modified (if necessary) and re-issued.


Prior to operations commencing, a Pre-Job Safety Meeting will be held to ensure that all parties involved in, or affected by, the work are aware of its nature and of the hazards involved. The meeting will be held on site and recorded on the Pre-Job Safety Meeting Form. Any outstanding actions following the meeting will be dosed out prior to operations commencing.

Any employee shall have the right to stop operations for discussion if he/she feels that there is a breach of safety procedures, or if an unsafe act is taking place.

#### 3.3 Site Induction and Permit to Work

All POWERPIPE operational personnel must have attended the PTT site safety induction course prior to commencement of operations. The POWERPIPE Project Engineer will brief personnel on the operational requirements, site hazards and relevant safety issues.



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All works must be carried out in accordance with the client safe working procedure. Job Risk Analysis is to be prepared and approved by client HSE before starting work.

#### 3.4 Pre-Job Safety Meetings and Toolbox Talks

I. The POWERPIPE Project Engineer immediately prior to commencement of operation will hold a Pre-Job Safety Meeting on site. All personnel involved in flushing operations should be in attendance.

II. The meeting will cover all job and site related hazards, safety controls in place, contingency plans in the event of emergencies and any other points deemed relevant. Any questions or queries should be raised at the meeting. Minutes of the meeting will be recorded on a POWERPIPE Pre-Job Safety Meeting Form.

III. The POWERPIPE Project Engineer will conduct Toolbox Talks before each new task/operation is undertaken, which will be recorded on the appropriate form. The purpose of the talks is to inform the POWERPIPE Crew of any potential hazards, safe working practices to be adopted and contingency plans in the event of an incident/accident. Client or third party personnel affected by the works are invited to attend.

#### 3.5 Hot Tapping Operation.

i. During Hot Tapping operation the surrounding area around-off point will be access restricted by use of barricade safety tape at a distance 10 meters from the tapping point. In addition to this danger signs shall be located in a sufficient distance around the area to warn the personnel of the activity.

ii. Ensure all the surrounding area is cleaned and all loose construction materials is removed, access to the restricted area shall only be permitted by the supervision.

iii. Ensure that the surrounding equipment are properly protected from the loose and unwanted materials from the blow off point.

iv. Ensure all the required personnel protective equipment such as ear plugs, gloves, safety glasses etc. are to be provided and worn by all the personnel involved in the operation.

#### 3.6 Near Miss / Incident / Accident Reporting

I. It is the policy that all accidents, incidents or near misses involving POWERPIPE personnel, equipment, property, or affecting third parties, must be reported without exception. This includes the operations and employees or companies subcontracted by POWERPIPE Services.

II. All employees must be aware of these requirements and of their duty to recognize and report any occurrence, which comes within the terms of the POWERPIPE and relevant Client Accident reporting system. POWERPIPE Project Engineer shall satisfy himself that all personnel under his control are aware of this requirement and shall periodically check this fact.

#### 3.7 Emergency Response Plan

Following are the major emergency incidents that might occur at site.

- I. Fire / Explosion.
- II. Injury due to lifting operation, fire, electrocution, civil unrest, Natural disaster, Medical also.
- III. Toxication.
- IV. Objects falling from height, sliding, moving parts, drowning, etc.
- V. The possibility of such an emergency occurring although is very less, the company has the requisite preparedness in such an eventuality.



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#### FIRE/EXPLOSION LEADING TO EVACUATION:

- I. Fire or explosion that has occurred at site and which is out of control and no longer localized to that section only shall be called as an 'EMERGENCY'. It is left to the discretion of the personnel at site of incident whether to call for an emergency or not.
- II. Emergency will be activated by any of these means – over the phone or by word of mouth or by shouts or using emergency siren. On activation of the emergency at the site, all those present at the work location including Technicians, supervisors, coordinator, helpers shall assemble at the Assembly Point and immediately report to their respective seniors as planned.
- III. The Assembly Point of the Industry or site is the open space present in front of the security room/ where it is safe.
- IV. The Engineer in charge shall report the head-count and the presence of their respective personnel and that of the Technician, supervisor who were under their control. The Manager or his designate who is the head-count man shall be the Site Incident Controller. He shall first ensure that the working area has been completely evacuated.
- V. Site Incident Controller will assume full control of the administrative aspect of the emergency. He shall dictate the immediate action to be taken at the Scene of incident. He shall guide the assembled people on further course of action.

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Hider		

Note:

- I. During an emergency always ensure that you do not panic or give any scope for confusion or chaos.
- II. Do not spread rumors or gossips.
- III. All shall adhere to the instructions delivered by the Site Incident Controller.
- IV. Make way for the emergency fighting resources to reach the source of incident.

#### TOXICATION:

Many chemicals found in the pipeline/work place have a harmful effect on humans. These chemicals may enter the body through skin absorption, through respiratory or elementary systems. Harmful effects may become apparent immediately or in the short / long term. In case of emergencies where gases enter the atmosphere is a critical area, as volumes of dangerous impurities are difficult to measure. It is therefore essential to that detection of any traces of dangerous gases above the Threshold Limit Value (T.L.V) and take the necessary safety precautions.

Special attention is drawn to the possible presence of extremely poisonous substances.

#### INJURY WHILE WORKING, FALL FROM HEIGHT/OBJECTS FALLING FROM HEIGHT

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While working at a height or while working/ walking near the site of works the possibility of fall from height or objects falling down is present and injury while working.

When you find someone being injured while working or by fall or by an object falling from a height.

- I. Immediately isolate the person from the source of injury ensuring that further danger or severity is arrested.
- II. Call for qualified assistance.
- III. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### EMERGENCY NUMBERS AND TRAINED FIRST AIDERS

EMERGENCY PHONE NUMBERS:(IN HOUSE)  
 Anywhere in India (Toll free)  
 FIRE – 101  
 AMBULANCE – 102/108  
 POLICE – 100  
 PROJECT INCHARGE –  
 HSE OFFICER –  
 HOSPITAL –  
 AT PLANT  
 FIRE STATION – FIRE  
 MEDICAL-  
 SECURITY-

#### TRAINED FIRST AIDERS AND FIRE FIGHTERS


NAME	DESIGNATION

#### CIVIL UNREST

- I. Civil unrest, is an activity arising from a mass act of civil disobedience (such as a demonstration, riot, or strike) in which the participants become hostile toward authority, and authorities incur difficulties in maintaining public safety and order, over the disorderly crowd. It is, in any form, prejudicial to public law and order.
- II. Familiarize yourself with the route, site set-up, and range of exits, help & security points.
- III. know alternative routes on different modes of transport
- IV. calculate plenty of time, set out early
- V. agree on a plan should you get separated while in a crowd
- VI. plan for an agree on potential emergency scenarios should you get hurt





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- VII. Carry some minimal items on your person: pocket first aid including burns, marker pen, tape, water etc.
- VIII. Be identifiable, have emergency contacts cards on person.
- IX. comply as instructed by public safety and health agencies and their reps
- X. assist others if you can to help reduce potential congestion, disorder or panic but always consider your own safety - keep alert and focused, rest often, keep hydrated
- XI. Save your phone battery life: text rather than call, turn screen brightness low, keep essential calls short but keep your family friends & colleagues updated. Let them know you are safe
- XII. Redundancy: helmets and other recreational gear can double as personal protection in extreme conditions.

#### MEDICAL EMERGENCY


- I. A medical emergency is an acute injury or illness that poses an immediate risk to a person's life or long-term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies such as cardiovascular (heart), respiratory, and gastrointestinal cannot be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from first aiders through Emergency Medical technicians, paramedics, emergency physicians and anesthesiologists.
- II. Stop Work: Abandon any plant, equipment or area immediately if a medical emergency occurs
- III. Assess the Risk: Check for Danger. Secure the area and Raise the Alarm what is the cause of the medical issue? Is it related to the work currently being performed? Has the patient been exposed to a dangerous environment (e.g. electricity, vehicle incident, fall from height) or is it due to personal health issues (e.g. heart attack, stroke), your priority should be to keep yourself and others safe. Decide if you are competent to manage the incident.
- IV. Notify: Report the incident to the site in charge immediately. They may take responsibility for managing the incident. If they are not available, contact Health, Safety, and Environment & Quality (SHEQ) Officer. If necessary, any people not involved in managing the incident should proceed to the emergency assembly area at the entrance of the site. As required, The Facility Manager or SHEQ will contact the relevant authorities immediately: Fire, Ambulance or Police. External authorities may take control of emergency response at the site.
- V. Control the Incident: Trained and competent First Aid Officers should render first aid. Contact Ambulance services if the medical emergency requires their assistance.

#### NATURAL DISASTER

A natural disaster is a major adverse event resulting from natural processes of the Earth like., floods, hurricanes, tsunamis, volcaniceruptions, earthquakes, and other geologic processes. A natural disaster can cause loss of life or damage property, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover and also on the infrastructure available.

#### Tornado:

- I. Small interior rooms on the lowest floor and without windows.
- II. Hallways on the lowest floor away from doors and windows.

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- III. Rooms constructed with reinforced concrete, brick, or block with no windows.
- IV. Stay away from outside walls and windows.
- V. Use arms to protect head and neck.
- VI. Remain sheltered until the tornado threat is announced to be over.

#### Earthquake:

- I. Stay calm and await instructions from the Emergency Coordinator or the designated official.
- II. Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- III. Evacuate as instructed by the Emergency Coordinator and/or the designated official.

#### Flood: If indoors:

Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official. Follow the recommended primary or secondary evacuation routes.

#### Flood: If outdoors:

- I. Climb to high ground and stay there.
- II. Avoid walking or driving through flood water.
- III. If car stalls, abandon it immediately and climb to a higher ground.

#### Hurricane:

- I. The nature of a hurricane provides for more warning than other natural and weather disasters.
- II. A hurricane watch issued when a hurricane becomes a threat to a coastal area.
- III. Once a hurricane watch has been issued: Stay calm and await instructions from the Emergency Coordinator or the designated official.
- IV. Moor any boats securely, or move to a safe place if time allows.
- V. Continue to monitor local TV and radio stations for instructions.
- VI. Move early out of low-lying areas or from the coast, at the request of officials.
- VII. If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- VIII. Collect drinking water in appropriate containers.
- IX. Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- X. Leave areas that might be affected by storm tide or stream flooding.

#### COMMUNICATION

- I. All communication to be through site in charge and External communication will be done by Coritech to media or anyother.
- II. The main channel of communication between the command center and incident command post is via telephone/ shouding.
- III. All-important contact telephone numbers, e.g. Government agencies, external bodies are displayed near the assembly point point.
- IV. The security guard is responsible for taking the head count, in coordination with the lseq department.



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#### EMERGENCY TEAM

The First Line Emergency Fighters' Team includes the following persons

Role	Name	Designation
Head-Count Man		
Fire fighter		
Communication Man		
Replacement		
First Aider		

#### MOCK DRILLS

Regular mock drill shall be conducted as per approved emergency plan at all the above stations. Deficiencies identified & corrective action taken shall be documented. In addition to the mock drills conducted by PTT, POWERPIPE with PTTcombined mock drills shall be organized once in two months to test the efficacy of response in emergency situations. Performance & findings of combined emergency drills shall be shared & documented between the organizations to sustain emergency preparedness at the highest level.

- I. Inform all the employees about mock drill.
- II. Fix the date for mock drill.
- III. Observers will not be involved in the exercise. They will monitor the Mock drill.
- IV. Emergency Siren / alarm will be raised.
- V. After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in above.
- VI. Observer will note down the activities with respect to the time.

#### 3.8 Shift Handovers (If applicable)

At every shift change there shall be a time period solely dedicated for the purpose of exchanging a written and a verbal account of the previous shift's operations. It is the responsibility of the POWERPIPE Project Engineer and POWERPIPE Shift Project Engineer to ensure that there is a complete exchange of all information sufficient to allow the "oncoming" crew to safely and competently continue with the operations. The shift handover period should include (when appropriate) a complete "walk through" of the systems under test in order to identify strategic areas or points.

#### 3.9 POWERPIPE QHSE representative

POWERPIPE project engineer shall act as POWERPIPE site QHSE representative. He shall be responsible for the overall supervision and safety of all POWERPIPE personnel on site (acting POWERPIPE site 'Health, Safety and Environmental Representative'), and will ensure all work activities undertaken are in accordance with Client / POWERPIPE approved work procedures, safe working practices and Permit to Work systems (if applicable).

#### 3.10 Risk assessments

A Toolbox Safety Talk will be conducted on site before each new job task or section of a job procedure. All personnel participating in the works will attend, with details of the work, the hazards and the

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precautions being discussed. Where shift work is in operation, the Toolbox Safety Talk will be given to personnel on both shifts. The talk(s) will be logged in the Daily Operations Report.

Any changes to the scope of work must be risk assessed. Prior to implementation, the changes must be reviewed and accepted by both POWERPIPE and client.

HSE Risk Assessments identify Hazards and the degree of Risk that they pose. Assessments are carried out to indicate the control measures (safety equipment, work procedures, isolation methods, training and communication) required to reduce Risk to an acceptable level. Assessments must be carried out and approved prior to work commencing.

The Risk Assessment Analysis sheet identifies the Hazards and Hazard Effects and is used to assess the Risk as follows:

An initial Risk Factor will be obtained by assessing the severity and probability (frequency) of the harm that might arise from the Hazard.

Existing or proposed Hazard control measures will be entered against each identified potential accident. These measures should reduce the risk to an acceptable level. If the risk remains unchanged other remedial action should be specified on the sheet until it is reduced.

#### 3.11 QC Considerations

The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information as dictated in the procedure. Each task should be ticked completed as the work progresses. During the preparation of the work or its progress, intermediate check lists, as required, will be signed off. The Project Engineer and the Welding Engineers are responsible for monitoring the progress of the work and recording pertinent information.

On completion of the works the Project Engineer must collate the completed documentation. The completed documentation will be included in the test report.

#### 3.12 Management of Change

POWERPIPE operates a Safety Critical system. All 'Safety Critical' activities defined in this document are identified with the following:

STOP

**STOP**

The Safety Critical system is in place to ensure that all personnel are aware of critical stages as defined in this document.

Changes to procedure may be required as a result of changes in the scope of work. Deviation from this procedure shall be subject to authorisation by POWERPIPE and PTT and shall be documented on a "Confirmation of Variation Instruction" form (Submitted only if necessary), will be used in any situation where the site works intend to deviate from the approved procedures. The POWERPIPE Engineering site representative is responsible for the development of the management of change and any associated risk assessment. The POWERPIPE Project Engineer will be responsible for compiling, logging and distributing the required forms as applicable and co-ordinating the risk assessment.

The Client representative and the POWERPIPE Project Engineer are responsible for the co-ordination and implementation of the management systems to authorize and manage changes.

