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1.0 SCOPE AND APPLICATION

The standard operating procedure (SOP) provides instructions on how to safely launch and receive pigs and troubleshooting steps for a stuck pig. This SOP does not cover any specific hazards or requirements around smart pigs.

This SOP applies to all pigging operations activities within the Resource Play BU’s owned and operated facilities (hereinafter collectively referred to as “Marathon

2.0 ROLES AND RESPONSIBILITIES

Role	Responsibility
Supervisor	<ul style="list-style-type: none"> Ensure no individual performs this procedure until the requirements in section 7.0 have been met.
Operator	<ul style="list-style-type: none"> Ensure SOP will always be available for adherence during job tasks. Complete annual Read & Acknowledge, and Field Verification through QMS assignment.

3.0 PROCEDURE

Steps for each operating phase, as applicable:

- Pigging Prerequisites;
- Pig Launching;
- Pig Receiving;
- Troubleshooting;



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- No Flow / Low Flow Operations

3.1 PIGGING PREREQUISITES

No.	Precaution/Action
1	<p>PERFORM a Hazard Assessment on location to identify all known hazards and review during the Job Safety Analysis (JSA) process.</p> <p>NOTE: A pre-developed/approved JSA is recommended for pig launching and receiving.</p>
2	<p>PERFORM a JSA prior to each task or as the job scope changes that includes basic job steps, potentials hazards, and steps to eliminate or reduce the risk to an acceptable level with the required personal protective equipment (PPE).</p>
3	<p>INSPECT all tools, equipment, and associated accessories for condition prior to begging work.</p> <p>Tools and PPE (minimum) needed to perform job safely are;</p> <ul style="list-style-type: none"> • 4 – gas personal monitor, and • Gloves, flame resistant clothing (FRC), hard hat, safety glasses, safety toed shoes, and • LOTOTO Kit (equipment locks, lock box, personal locks, and tags), and • Grounding wire with clamps, and • Digital Pressure Gauge (Crystal Gauge), and • Ohm Meter, and • Metal or conductive drain pan to catch excess fluids, and • Pigging Trailer, pump, seating tool, and • Hearing protection when blowing down equipment (gas lines).
4	<p>RP Energy Isolation Procedure shall be followed when isolating the process equipment prior to opening or blowing down to prevent injury to personnel and equipment damage.</p> <p>NOTE: A pre-develop Energy Control Procedure (ECP) is recommended for pig launching and receiving. When a pre-developed ECP is not used a Marathon Authorized Employee must write an ECP and reference Diagrams 3 and 4 to isolate the trap properly.</p>
5	<p>PERFORM location inspection prior to use to determine condition of:</p> <ul style="list-style-type: none"> • Pig trap doors, • Gaskets, • Vents, and • Grounding grid box, connections and clamp.



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6	<p>VERIFY equipment distances and spacing in compliance with RP Hot Work Procedure (e.g. 50 ft for venting frac tanks). Issue a safe work permit for locations that distance cannot be maintained.</p> <p>VERIFY airborne contaminants are below the threshold limits of exposure for routine operations within the area as required by the RP Opening Process Piping and Equipment Procedure. When threshold limits are exceeded all the requirements of the “Large Diameter Piping - Readings Above Thresholds or Unknown” section shall be implemented.</p>
7	<p>VERIFY any frac tanks used for draining purposes are grounded/bonded and attached to the grounding grid (or properly grounded) when in use.</p> <p>NOTE: Refer to Diagram 1: Grounding Setup for grounding requirements.</p>
8	<p>WARNING: Local venting is prohibited when pig launcher/receiver is not isolated. When venting is required and isolation is not used the trap shall be routed to a bonded/grounded frac tank with Pigging Supervisor approval.</p>
9	<p>WARNING: Bonding and grounding must be maintained for all equipment during any fluid or gas transfer and venting. Any pans/buckets used to capture any residual liquid must be connected with a grounding cable/wire to avoid a static electricity build up.</p>
10	<p>VERIFY Pig Launcher and Pig Receiver are set up properly before pigging can proceed.</p>
11	<p>NOTE: DOT line pigging requires a DOT-qualified operator or onsite supervisor.</p>
12	<p>NOTE: This procedure assumes a two-person crew is performing this activity. If pigging is being done by a single individual, additional pressure monitoring may be required and should be discussed with the task supervisor. In addition, the receive must be set in “soft receive” prior to launching.</p>
END PIGGING PREREQUISITES	

3.2 LAUNCHING A PIG

Step	Action
1	COMPLETE Launching Pig JSA.
2	CONTACT Pigging Competent Person at the receiver and inform them you are preparing the Pig Launcher.
3	ATTACH ground and test equipment for resistance (>5 ohms).



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	WARNING: Bonding and grounding must be maintained for all equipment during any fluid or gas transfer and venting.
4	INSTALL digital pressure gauge (e.g. Crystal Gauge) on Pig Launcher.
5	ISOLATE pig trap using an Energy Control Procedure.
6	OPEN the pig trap door and insert the pig. Seat pig until it makes a tight seal in the reducer.
7	CLOSE the pig trap door.
8	UNISOLATE pig trap using an Energy Control Procedure.
9	PURGE pig trap prior to launching pig into system. NOTE: For liquid lines most the air must be purged from trap prior to launching the pig into the liquid system.
10	LAUNCH pig into the main line.
11	VERIFY pig has left launcher by pig indicator (signal) and digital pressure gauge.
12	INFORM the Receiving Pigging Competent Person the pig has left the trap.
13	RETURN pig launcher to normal operating mode once verified it has been launched.
14	VERIFY pressures throughout pig run to prevent high line pressure and well shut ins.
END LAUNCHING A PIG	

3.3 RECEIVING A PIG	
Step	Action
1	COMPLETE receiving a Pig JSA.
2	CONTACT Pigging Competent Person at launcher and inform them you are preparing the Pig Receiver.
3	ATTACH ground and test equipment for resistance (>5 ohms). WARNING: Bonding and grounding must be maintained for all equipment during any fluid or gas transfer and venting.



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4	INSTALL digital pressure gauge (e.g. Crystal Gauge) on Pig Receiver.
5	OPEN receiver valve and kicker valve fully.
6	CLOSE mainline valve fully.
7	VERIFY pressures throughout pig run to prevent high line pressure and well shut ins. NOTE: This is to be done in conjunction with Pig Launching Competent Person.
8	CONFIRM pig is in the receiver by indicator (signal) when the pig arrives at the receiver. NOTE: A cage is installed on the pig receivers to prevent pig from entering the kicker line.
9	INFORM the Pig Launching Competent Person the pig has been received.
10	ISOLATE pig trap using an Energy Control Procedure form and verify there is zero pressure on the pig trap.
11	OPEN the closure door and remove the pig.
12	REMOVE isolation and secure pig receiver.
END RECEIVING A PIG	

3.4 TROUBLESHOOTING

Step	Action
1	VERIFY pig is not moving by pressure differential and if any wells begin shutting in.
2	NOTIFY the Person In Charge (e.g. PIC) of “stuck pig” condition immediately. NOTE: When the PIC is not available notify Pigging/Task Supervisor of the condition.
3	VERIFY PSIG rating for line being pigged.
4	NOTIFY Engineering to determine max MAWP PSIG online.
5	VERIFY abnormal operating conditions with affected Operations Supervisor/Operations Lead/Control Room.



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6 **DETERMINE** if it can be placed in soft receive, Operations can make operational adjustments, or intervention is needed (i.e. pump truck to push pig).

7 **STOP** work until affected Supervisor and Engineering can determine a path forward.

END TROUBLESHOOTING

3.5 PUMP TRUCK PURGE: LOW FLOW/NO FLOW

Step	Action
1	COMPLETE Launching Pig JSA.
2	CONTACT Pigging Competent Person at the pig receiver and inform them you are preparing the Pig Launcher.
3	ATTACH ground and test equipment for resistance (>5 ohms).
4	INSTALL digital pressure gauge (e.g. Crystal Gauge) on Pig Launcher.
5	ISOLATE pig trap using an Energy Control Procedure.
6	INSTALL an atmospheric vent line (i.e. candy cane) on top of Pig Launcher.
7	VERIFY pump truck is connected to pig launcher and installed as detail in diagram 1.
8	VERIFY the MAWP and maximum set points with Engineering.
9	SET pump truck high pressure kill below the MAWP of the pipeline, refer to Engineering for specific set pressure. Test against drain valve. NOTE: Set points must never exceed the MAWP of the corresponding pipeline or any components of the system.
10	FILL pig launcher by gravity draining oil/water from the truck to the Pig Launcher and out the atmospheric vent (e.g. "Candy Cane").
11	CLOSE atmospheric vent and equalize pressure between trap and hose by opening the kicker valve.
12	UNISOLATE pig trap using Energy Control Procedure.
13	SLOWLY start pumping into pig launcher.



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	<p>CAUTION: Never pump a pump truck into an isolated trap. This could result in overpressure of the trap in a very short time – one or two strokes of the truck pump will overpressure the trap.</p> <p>CAUTION: Never allow fluid level in the pump truck to get low enough to allow oxygen to be drawn into the system.</p>
14	VERIFY pump truck is always manned and pressures are monitored during pumping operations.
15	CONFIRM receipt of pig into pig receiver.
16	SHUTDOWN pump truck.
17	ISOLATE pig trap launcher using Energy Control Procedure.
18	DEPRESSURE pump truck, hoses and attached equipment and drain all equipment prior to breaking containment.
END PUMP TRUCK PURGE: LOW FLOW/NO FLOW	

4.0 RECORDKEEPING

All records are maintained according to the Company Records Retention Schedule.

5.0 TRAINING

Job roles followed by training level for this procedure are as follows:

All Initial Training shall be issued as Level 3 and as detailed below thereafter:

- Person-In-Charge of Pigging, Level 3
- Lead Pigging Technician, Level 3
- Pigging Competent Persons, Level 2
- Pigging Technician, Staff Augment, or Third-Party Contractors, Level 2
- Supervisors of Pigging Operations, Level 2

Level 1 (Awareness): Read procedure and acknowledge when complete.

Level 2 (Advanced): Level 1, AND explain procedure to supervisor or designee. Supervisor or designee must approve when individual has satisfied the Level 2 requirement.

Level 3 (Skilled): Level 1, Level 2, AND demonstrate procedure to supervisor or designee. Supervisor must approve when individual has satisfied the Level 3 requirement.

NOTE: All three levels of training will be assigned and managed in the QMS system. Qualifying criteria will expire (requiring requalification) in accordance with the review cycle defined in the title of this procedure.



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6.0 DEFINITIONS

Terms	Definitions
Pigging Competent Person	An individual (MOC Employee, Staff Augment or Third-Party Contractor) that has completed the appropriate training level described in section 5.0 and has been assigned duties by a MOC Supervisor to perform Pigging Operations.

7.0 REFERENCES

Diagram 1: Grounding Steup

Diagram 2: Ground Test

Diagram 3: Pig Launching

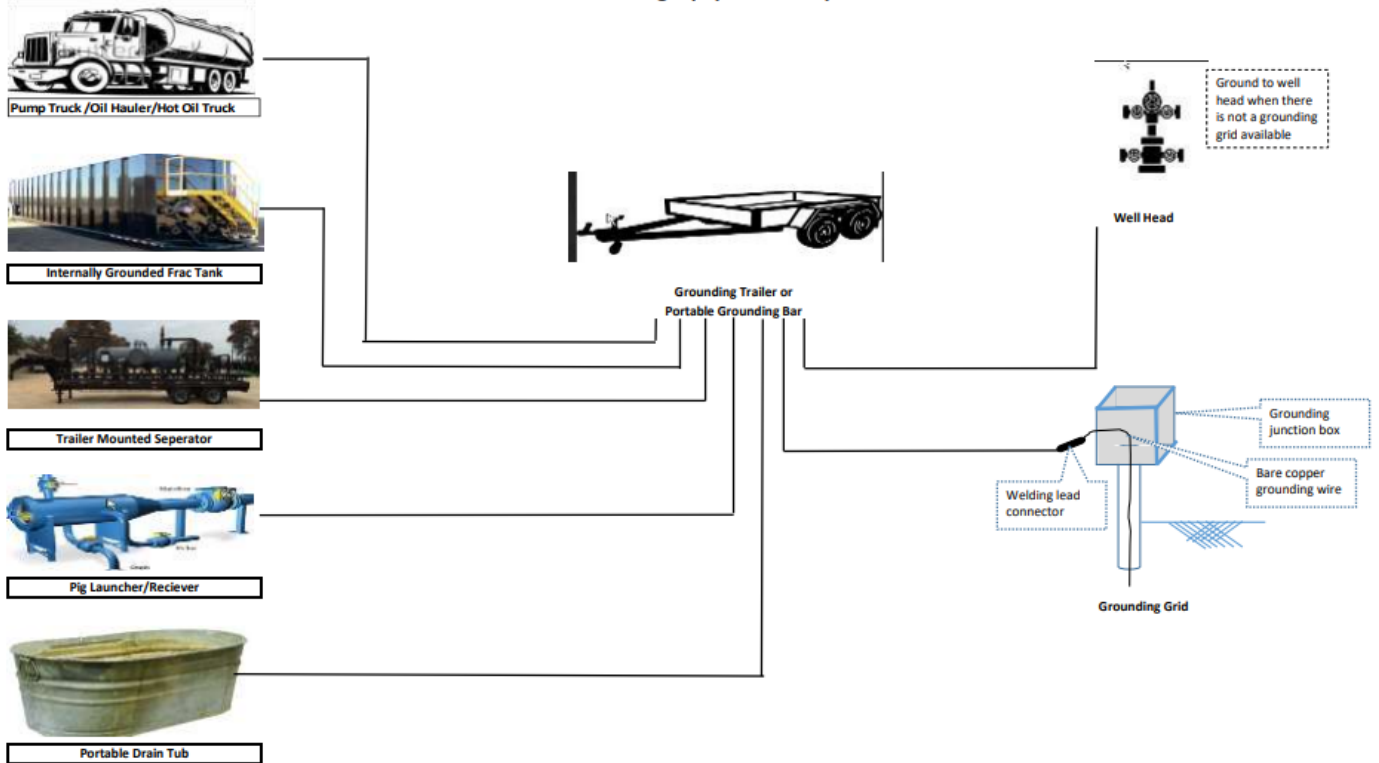
Diagram 4: Pig Receiving



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Diagram 1: GROUNDING SETUP

Grounding Equipment Setup

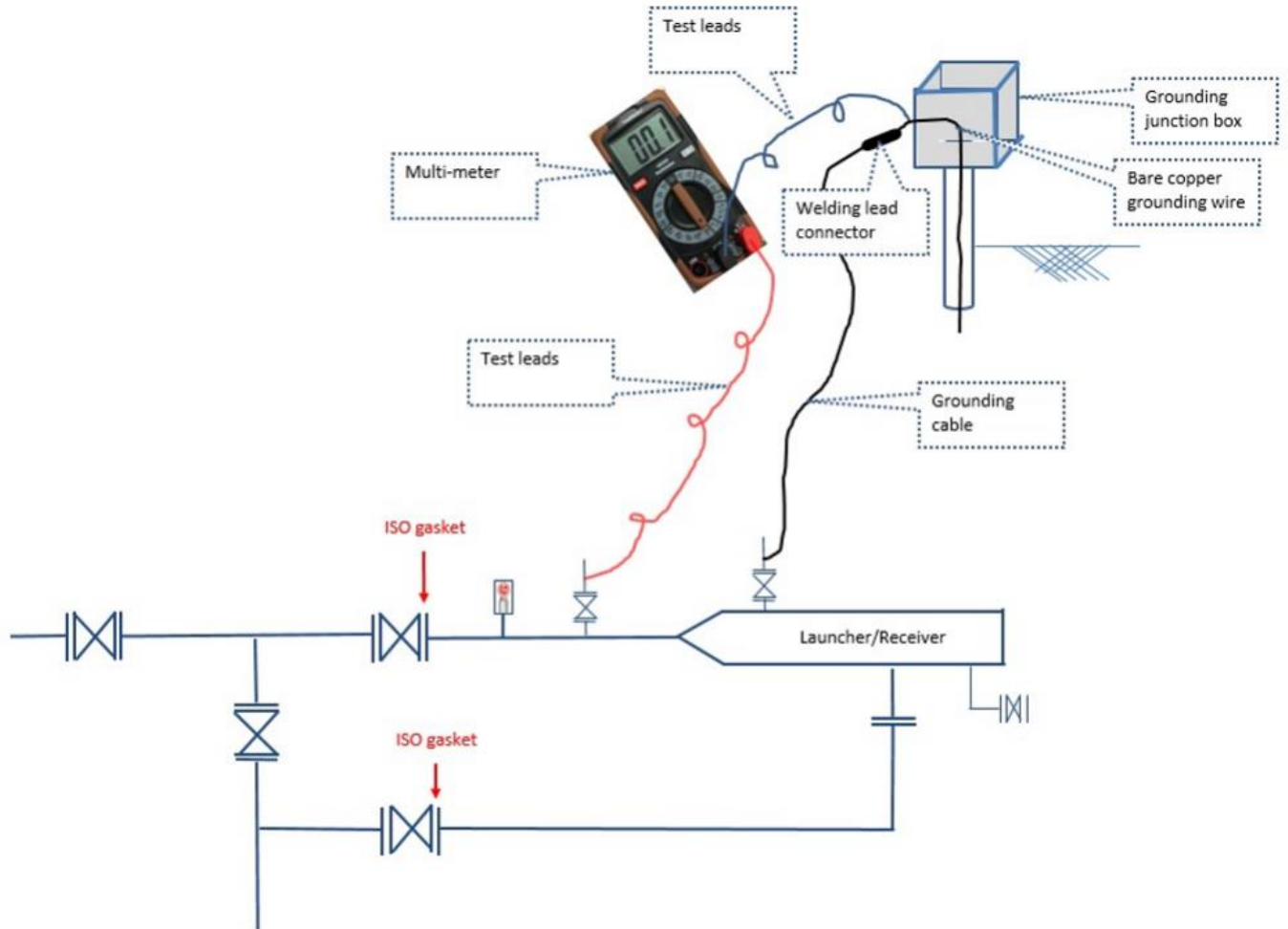


END GROUNDING SETUP



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Diagram 2: GROUND TEST

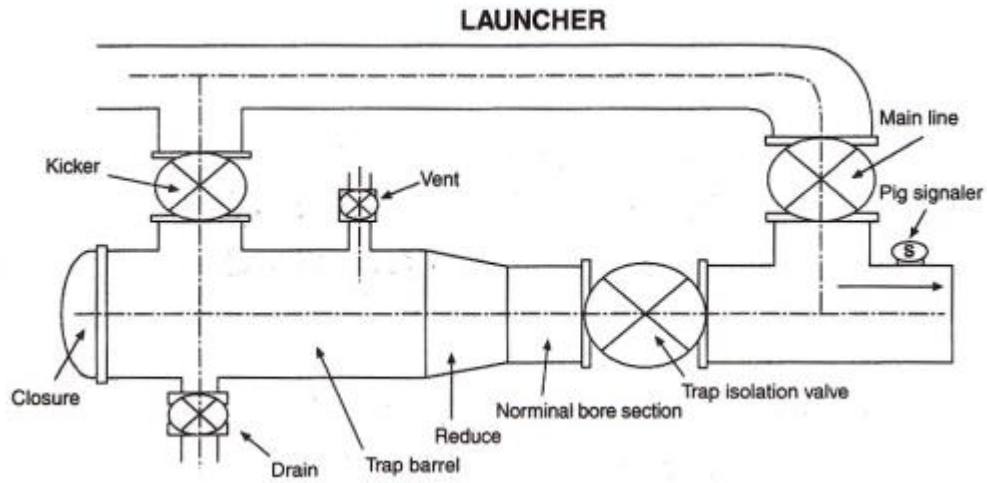


END GROUND TEST



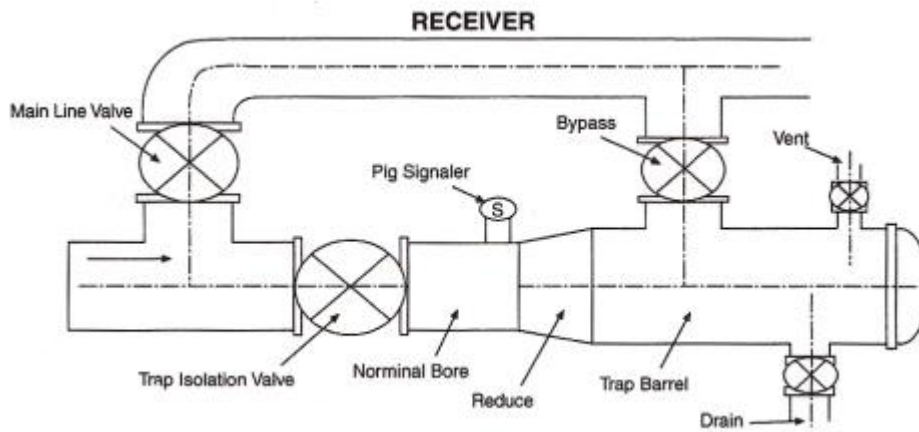
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Diagram 3: PIG LAUNCHING



END PIG LAUNCHING

Diagram 4: PIG RECEIVING



END PIG RECEIVING



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APPENDIX A – CHANGE REGISTER

Summary of Changes:

Section #	Description of Change
Date of Change: 23-Jul-24	
	New RP organizational SOP
Date of Change:	