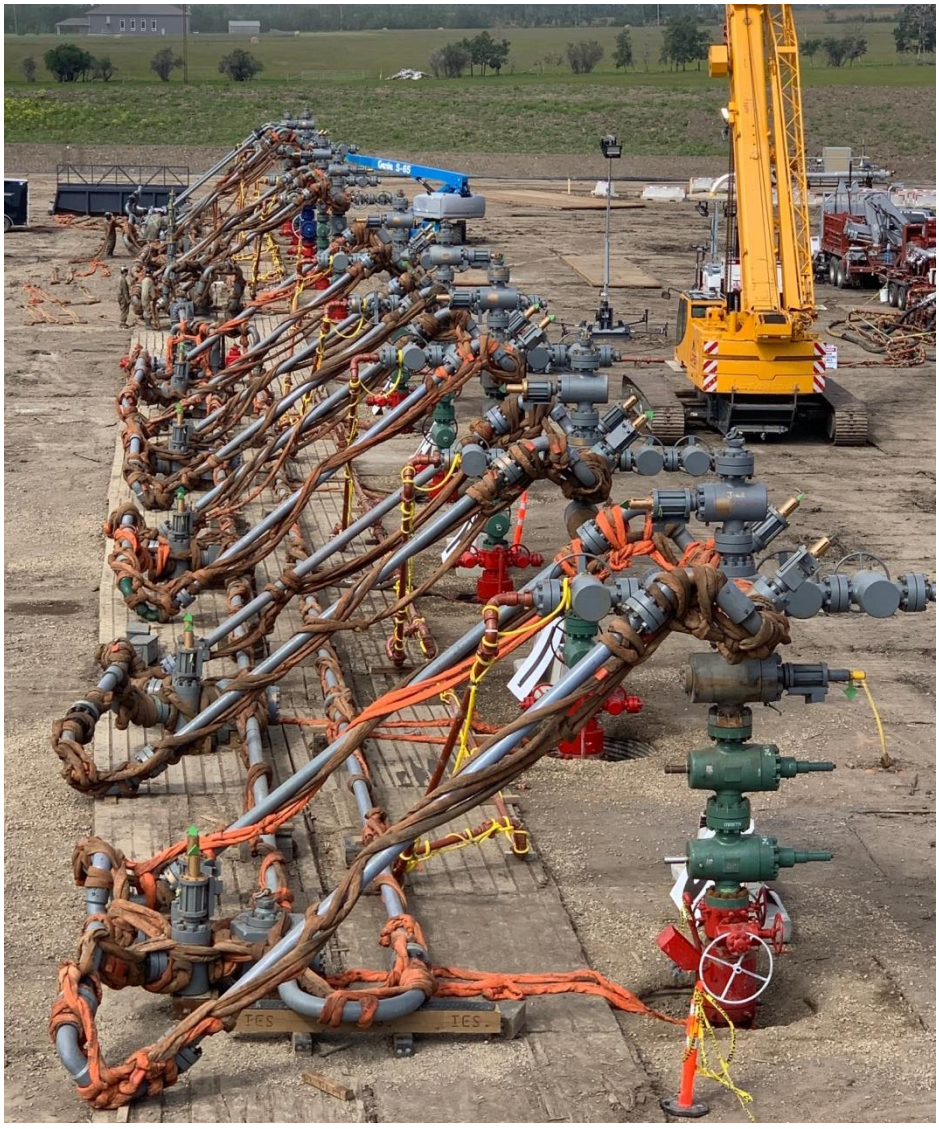
Trunk Line Swivel Frac Manifold

WHY CHOOSE IES

- Unique design that arrests erosion for all components, promoting equipment longevity and reliability
- Optional Screen Technology reduces screen out, saves stages, reduces erosion to the Frac Tree and Wellbore
- Competitive pricing including substantially quicker install and removal time, saving our clients significant dollars
- Fully qualified inspection team that fully inspects for erosion (with NDT including, UT, MPI & Hardness Testing), recording every certified component prior to releasing for field use.



IES TY Splitter to Main and Auxiliary Lines

SPECIFICATIONS

- 15,000 psi (103.4 MPa) max working pressure
- 5 1/8 API Flanged end connections
- 4 1/16 API Flanged swivel standing iron
- Maximum frac flow rates up to 21 m^3/min
- Velocity reduction due to debris screens
- Negligible erosion in slurry mixing areas, design promotes laminar flow
- Unique TY Block promotes equal fluid distribution

The IES dual swivel flanged entry design features **negligible erosion with opposing fluids and swivel sweeps promoting smoother frac flow versus abrupt single entry angle changes.** IES standing iron swivel flanged connections are flexible and conform for ease of assembly, meaning there are no rigid flange connections that require perfect alignment to assemble**.** In addition, the **IES debris screen** not only greatly reduces **damaging debris** from entering the well bore, they also assist in promoting smoother frac flow versus abrupt single entry right angle changes in fluid direction resulting in smoother laminar flow in the frac tree into the well bore entry.

IES client's downhole analysis has confirmed that our IES screened manifold system significantly prevents immediate wellbore entry erosion.

FEATURES AND BENEFITS

- Standing Iron Swivel Flanged connections are **free to move and absorb line jack** and vibration that **reduces lateral stress** on the Frac Tree base, including adjustment for frost movement

- Screened technology that includes opposing fluids gently meet at the main buffalo head, mix, conform and continue downward, this **eliminates potential frac tree and wellbore erosion damage**

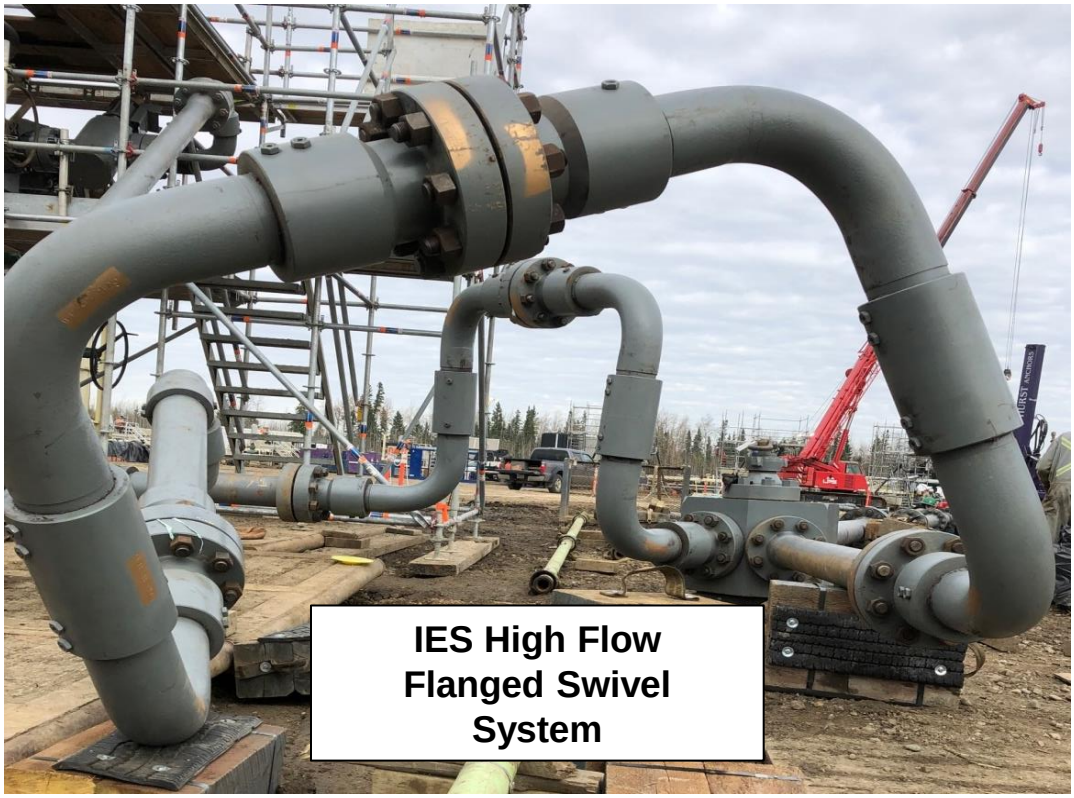
- Light weight sleek design but erosion efficient components are user friendly as they are pre-assembled in-house, saving our clients significant time and dollars. The assemblies are compact and transported on dedicated skids making the manifold 2 – 3 times quicker to assemble onsite.

- Versatile, ease of adjustment in tight footprint areas

- Large green arrow remote valve indicators to confirm desired valve function

- Proven to be 100% on over 700+ pad well deployments

- **IES has pumped over 1.80 million tonnes of sand through our systems with minimal erosion.**



IES High Flow Flanged Swivel System

Remote Grease Station

IES has an inventory of twenty-four (24) greasing stations. The remote grease stations only include remote activated valves within, that way, IES can ensure personnel **never** have to enter the hot zone area. The IES grease station is sleek, state of art, and includes separate manifold stations dedicated to each leg. The system features a **DOUBLE BARRIER** immediately off the remote valve grease port, ensuring full well pressure containment at all times.

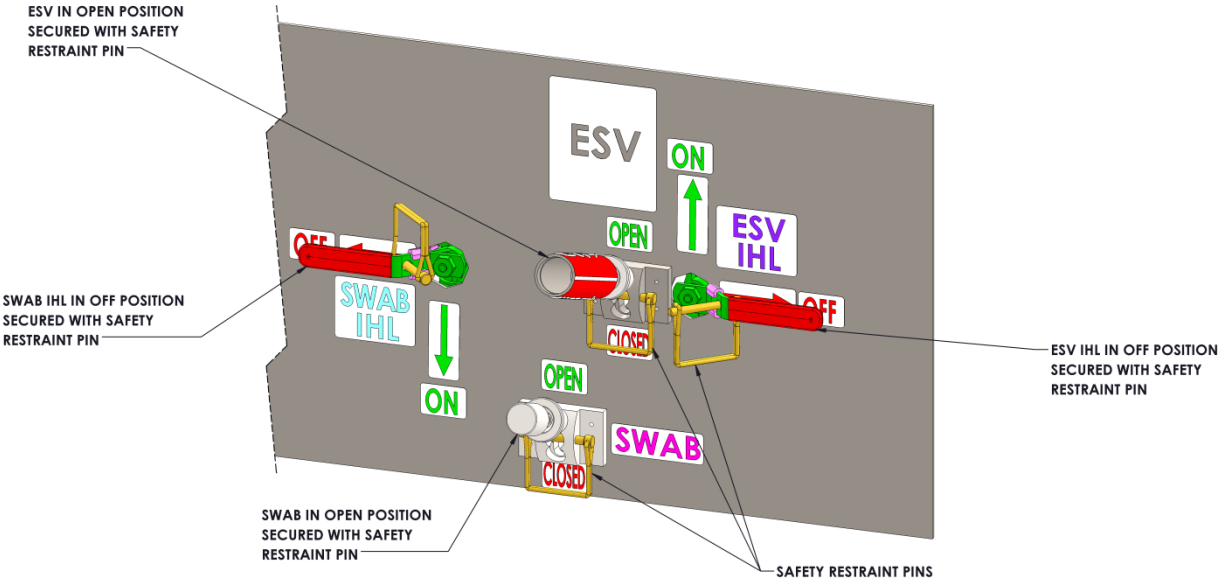
Remote Valve Performance

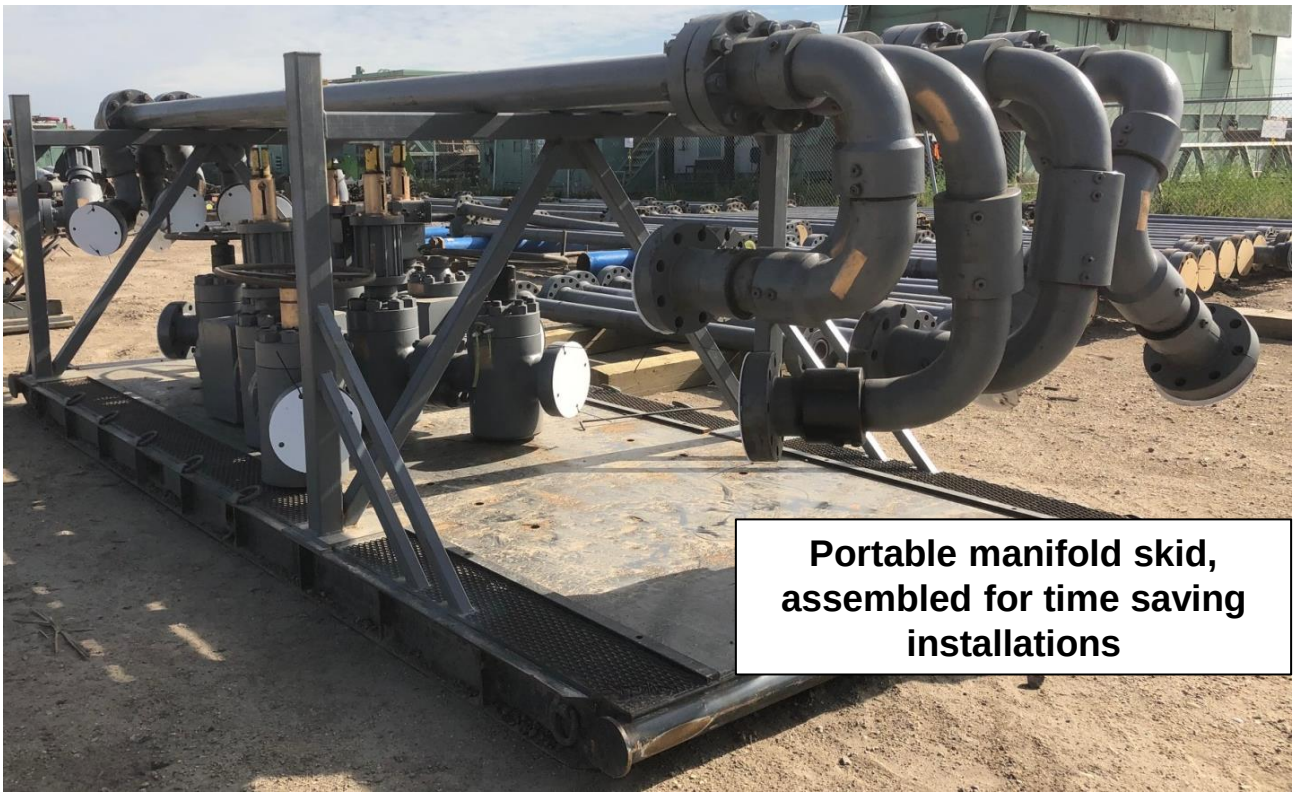
IES valve performance on recent manifold pad jobs, including large pads should not be taken for granted, pad-after-pad our equipment and people have performed stellar. For example, we have researched the number of remote valves we have supplied over the past **60 Plug and Perf manifold pad wells.**

- Total stages: **2,280**
- Total tonnage: **420,000 tonnes**
- Average rate: **11 – 14 M3/min**
- Average pumping pressure: **65 MPa**
- Total valves supplied: **498 Valves**; 3 1/16" to 7 1/16 **(majority remote valves)**
- Valve efficiency was **99.99%**
  - Total 15K flanges connections**: over 2000 (all held 100% for the pressure testing and pumping operations)**
  - Total components: **600 (performed to full expectation)**
  - **Zero to negligible erosion was confirmed by our qualified inspection team**

Isolation Hydraulic Lockout (IHL)

IES's IHL System shuts off the hydraulic flow for both the ESV and Swab Valves, preventing unintentional closure of the valves during E-line operations. The IHL control **requires three actions** to deactivate including removal of a manual locking pin. The ESV and Swab control lever **requires four actions** to activate closing of either remote valve, including removal of the locking pins.





Portable manifold skid, assembled for time saving installations