

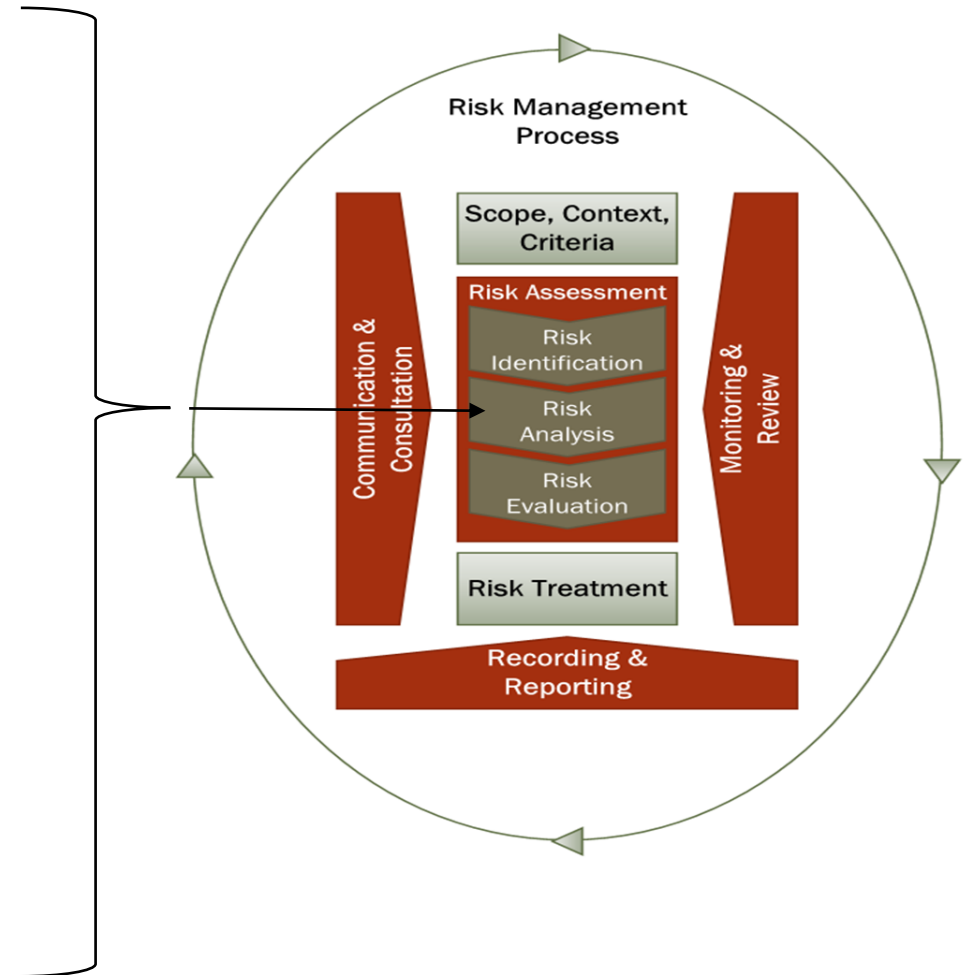
Risk Management – Hazard/Risk Analysis

Hazard Analysis methods:

- Informal Pre-task Hazard Analysis
- Task Hazard Analysis
- Job Hazard Analysis/Job Safety Analysis
- What-if Analysis
- Hazard and Operability Analysis (HAZOP)
- Change Analysis

Risk Analysis methods:

- Preliminary Hazard Analysis
- Failure Mode and Effects Analysis (FMEA)
- Fault Tree Analysis
- Fishbone



Risk Management – Hazard/Risk Analysis

Hazard Analysis Methods

- Job Hazard Analysis (JHA)

Job Hazard Analysis		
Job: <i>Equipment Preparation & Rig Up</i>		Date: <i>4-1-15</i>
Task	Hazards	Controls
1. Assess location to determine the spotting of equipment	1.a: struck by moving equipment	1.a: Spotters; high visibility vest; controlled access; maintain 25' distance from operation
2. Unhook trailers and rig up gin poles	2.a: hand pinch; 2.b: struck by pole; 2.c: struck by moving equipment	2.a: Grabber hooks with safety latches; hand placement; 2.b: certified cables with tags on poles; 2.c: Spotter; High-vis vest
3. Unload iron, valves, separators, plug catchers	3.a: chain sling failure; 3.b: manual handling; 3.c: vehicle backing	3.a: certified & tested slings; visual daily inspection; 3.b: use of mechanical aids; proper lifting; 3.c: spotters; high-vis vest; 360 walk around
4. Set & install plug catcher, hydraulic chokes & half pit	4.a: chain sling failure; 4.b: manual handling; 4.c: backing vehicles	4.a: certified & tested slings; visual daily inspection; 4.b: use of mechanical aids; proper lifting; 4.c: spotters; high-vis vest; 360 walk around
5. Set & install sand separator, bypass, & hook up to frac tank	5.a: chain sling failure; 5.b: pinch points; 5.c: manual handling; 5.d: backing vehicles	5.a: certified & tested slings; visual daily inspection; 5.b: proper hand placement; 5.c: use of mechanical aids; proper lifting; 5.d: spotters; high-vis vest; 360 walk around