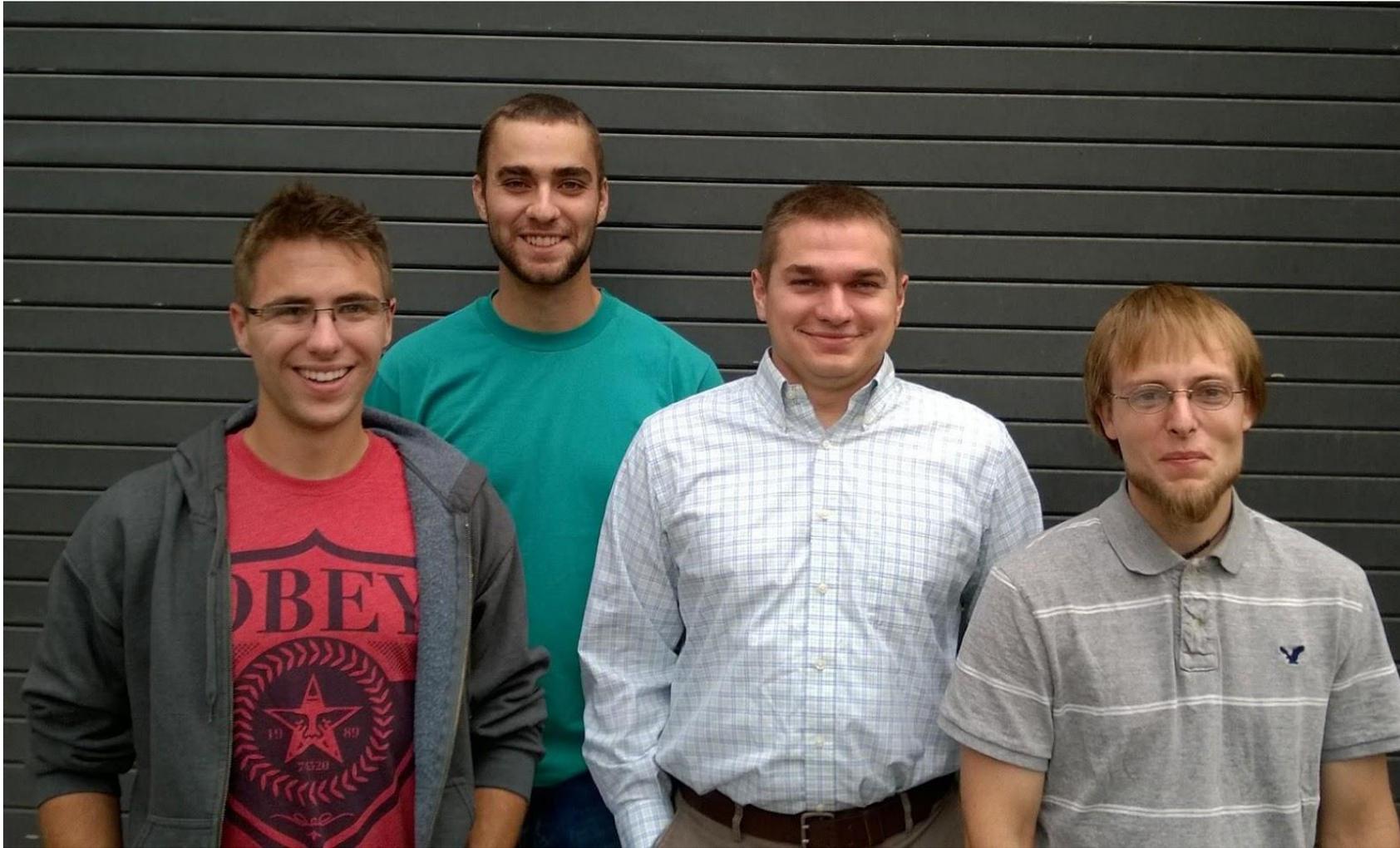


Liquid Gold

Pilot Industrial Biodiesel  
Reactor

# Team Members



Brian Hanson (BAE) Andrew Engel (ME) Connor Saxe (ME) Gene Staggs (BAE)

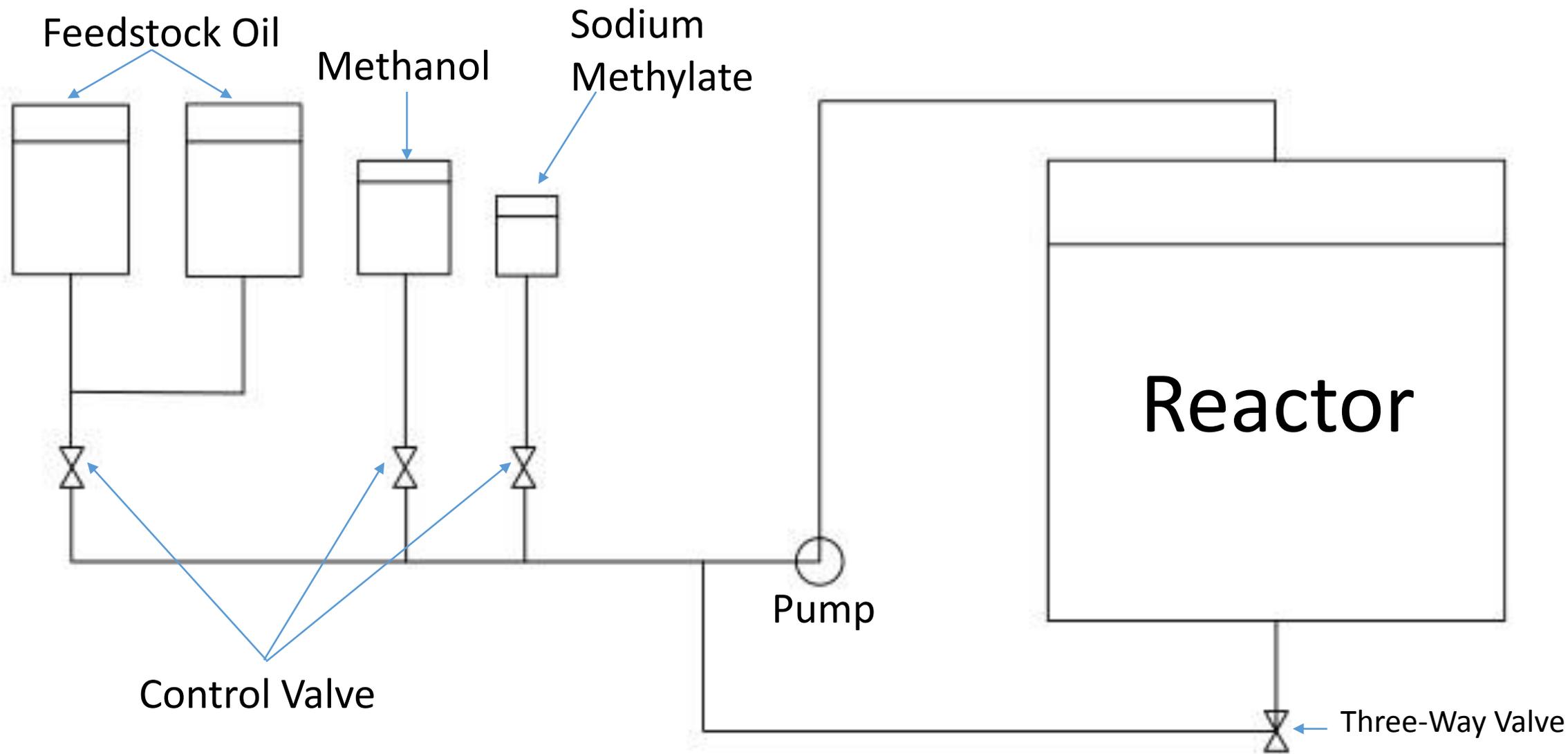
# Project Scope

Bring the University of Idaho BAE Biodiesel Facilities up to a state of the art condition, with the capabilities to produce high quality biofuel in a safe and efficient manner.

# Concept Design

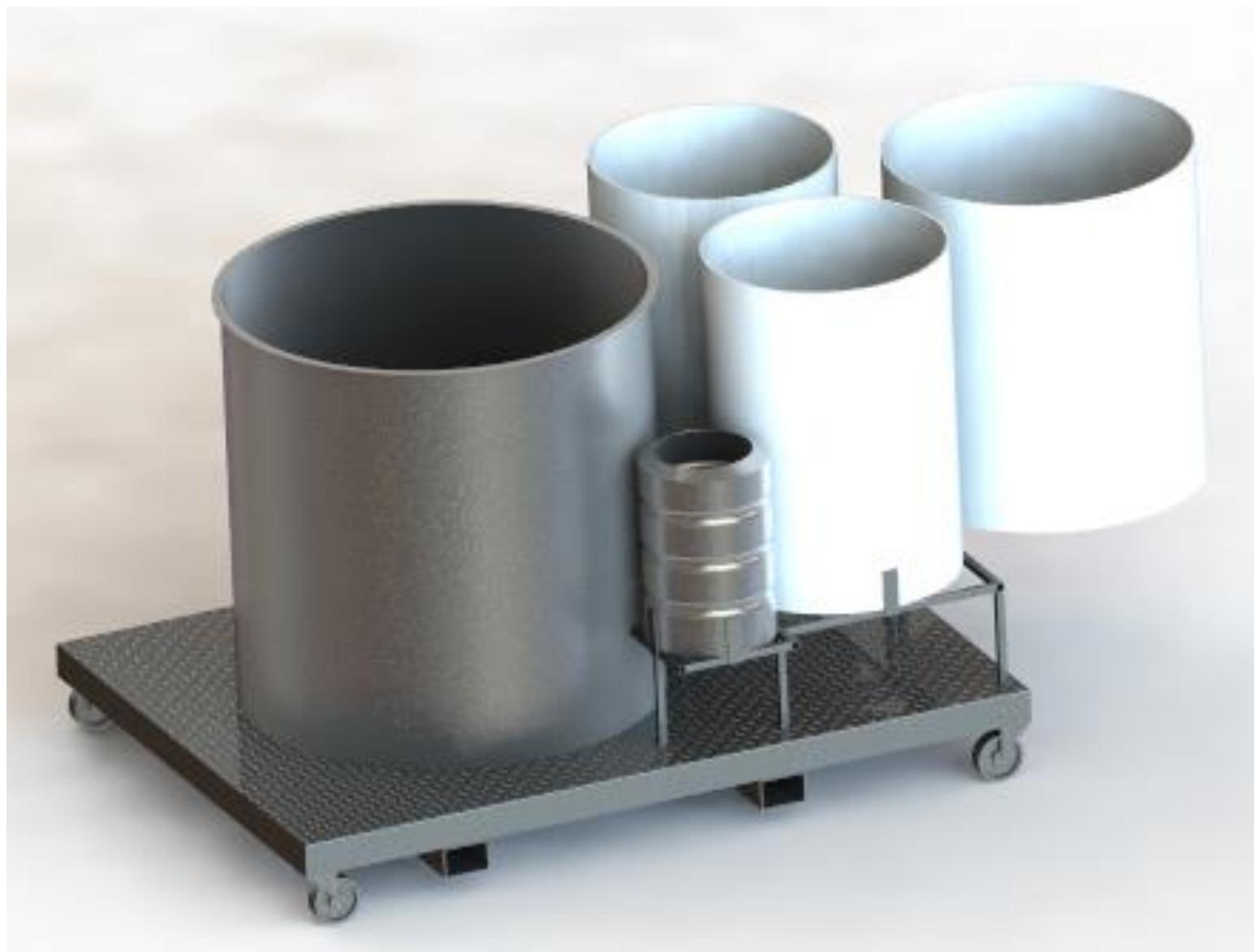
# System I

- System Deliverables: Ingredient Introduction and Mixing
  - System Features:
    - No human interaction ingredient handling and introduction
    - Static mixing
    - Sonification mixing
    - Individual tank control valves
    - Centralized electrical controls
    - Recirculation loop



# System I Design Cost

Item	Quantity	Cost/unit	Total Cost
Stainless pipe	24	\$2.89	\$69.36
toggle switch	4	\$3.90	\$15.60
solid state 25amp relay	2	\$37.00	\$74.00
Wire Control Box flex	1	\$50.00	\$50.00
methanol gas detection sensor	1	\$150.00	\$150.00
Polyethylene for welding lid	1	\$19.95	\$19.95
Strainer basket	1	\$91.25	\$91.25
1" 8' length steel standard valve	10	\$24.17	\$241.70
	5	\$20.00	\$100.00
	Grand Total	\$	811.86

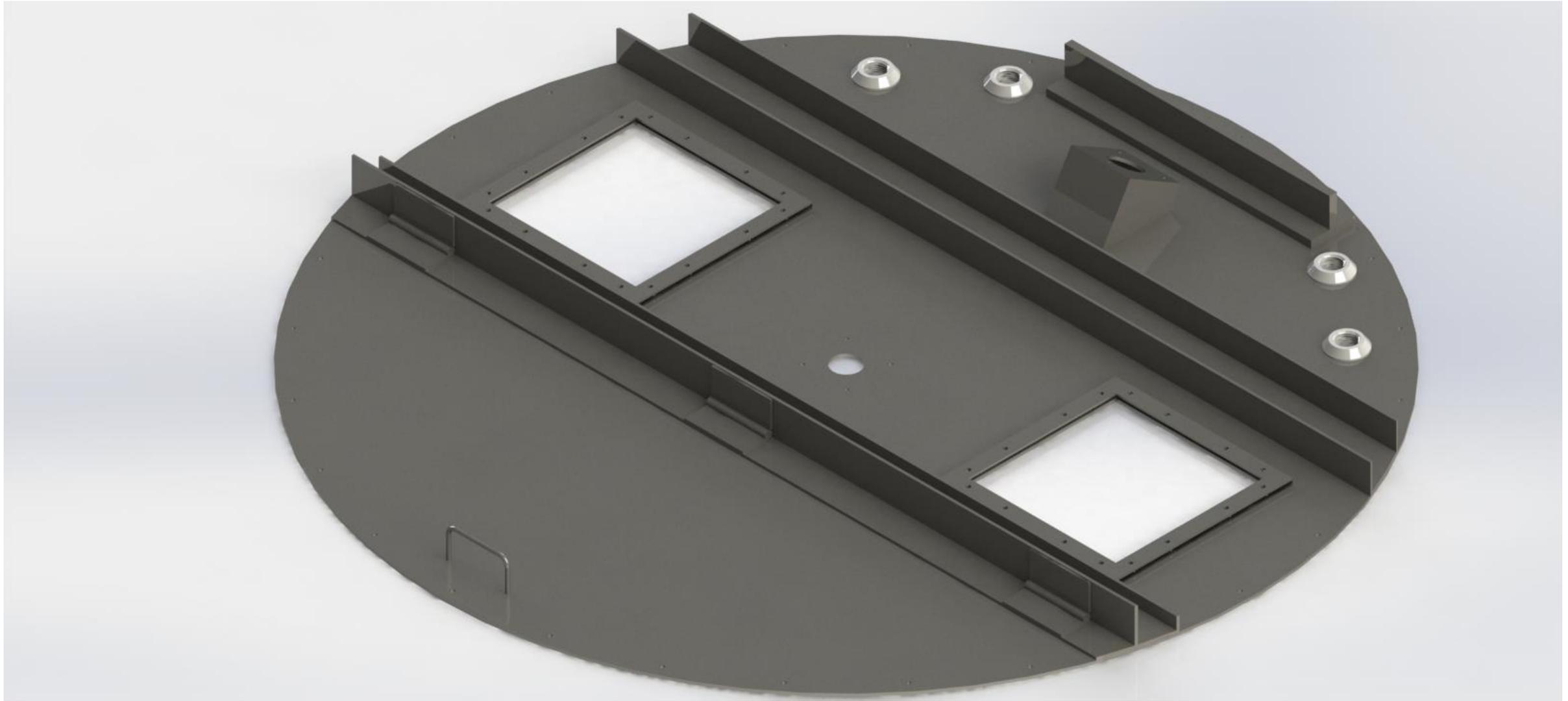


# System II

- System Deliverables: Enclosed, Explosion Proof Reactor Vessel with Methanol Recapture
  - System Features:
    - 3/16" 304 Stainless Steel w/ Welded Accessories
    - Agitation and Plumbing Ports
    - Viewing Glass
    - Hinged Access
  - Design Refinement: Explore cheaper methods of constructing a sufficient tank enclosure

# System II Design Cost

Item	Material	Size	Quantity	Cost/unit	Total Cost
Steel Sheets	T304	3/16 - 4*8 Feet	1	\$1,000	\$1,000.00
Glass Viewports	Borosilicate	1/4*12*12	2	\$48.40	\$96.80
1" Half Coupling	T304		4	5.87	\$23.48
NPT-Tri-clover fitting	T304	1" pipe to 2" fit	4	\$20.00	\$80.00
20' O-ring stock	Buna-N	1/8" square	1	\$14.60	\$14.60
1" Weld on Tank Female Fitting	316 SS	1"	4	\$24.30	\$97.20
U-channel	Steel		10	\$50.00	\$50.00
Bolts	steel	1/4" by 3/4"	100	\$0.04	\$4.14
Bolts	316 SS	1/4" by 3/4"	25	\$0.23	\$5.74
Grand Total					\$ 1,371.96



# System III

- System Deliverables: Theoretical Electronically Controlled Processing Design
  - System Features:
    - System push button start
    - Electronic display and interface
    - Electronic control valves
    - No operator measurement required

# System III Design Cost

Item	Quantity	Cost/unit	Total Cost
ultrasonic level sensors	4	\$4.00	\$16.00
silcone sealant	1	\$4.00	\$4.00
Explosion proof selenoid valve 2	4	\$107.00	\$428.00
Explosion proof selenoid valve 3	1	\$150.00	\$150.00
Atmega328 10bit micro cont	1	\$5.50	\$5.50
thermo couple	1	\$15.00	\$15.00
20 Amp current sensor	1	\$24.00	\$24.00
LED indicators	4	\$1.75	\$7.00
Shift register built in 48	1	\$24.95	\$24.95
Solid introduction	1	\$45.00	\$45.00
Grand Total			\$ 719.45

# Research